### APPENDIX H

### DRAFT UMAM ANALYSIS

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### SOUTHERN PALM BEACH ISLAND COMPREHENSIVE SHORELINE STABILIZATION PROJECT DRAFT UMAM ANALYSIS

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# 1.0 INTRODUCTION

The area of impact determined from the Engineering Analysis and Numerical Modeling Study (provided as Appendix G to the EIS) was used to complete a Uniform Mitigation Assessment Method (UMAM) evaluation (Chapter 62-345, F.A.C.) for the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project. UMAM assesses the functions and services of the hardbottom resources predicted to be impacted, and determines the amount of appropriate mitigation to compensate for these impacts. The UMAM evaluation presented herein was developed to specifically assess the anticipated loss of nearshore hardbottom function attributed to the construction of the Applicants' Preferred Alternative as well as to all proposed alternatives evaluated in the EIS. Impacts to hardbottom include two general categories:

- *Direct* = burial resulting from direct placement of sand at time of project construction (within construction toe of fill (CTOF)).
- *Indirect* = impacts resulting from the spreading of sand following project construction (outside CTOF).

While the impacts can be described generally as direct or indirect, more detailed description is necessary to accurately account for anticipated project related impacts to the nearshore intertidal and subtidal hardbottom. The hardbottom habitat adjacent to the Project Area is shown to be highly ephemeral. From 2003 to 2013, the quantity of exposed nearshore hardbottom within the Study Area of this Project (R-127 to R-141+586) has shown extreme natural variability, ranging from 3.06 acres (2009) to 51.20 acres (2006). The impact analysis conducted for this Project considered this natural variability by evaluating ten years of hardbottom delineation (2003 to 2013) to estimate the time-averaged exposed acreage, and in turn to determine the mitigation acreage for this impact area. In order to appropriately mitigate for impacts to this highly ephemeral habitat, it is important to distinguish permanent impacts from temporary impacts.

Numerical modeling estimated the movement of sand for 3 years following construction of the Project. The numerical modeling results indicate that a portion of the sand placed below mean high water (MHW) will remain within the CTOF for all 3 years following construction, while the remainder of the sand will be transported offshore and/or downdrift of the placement area as the beach equilibrates. The Town of Palm Beach and Palm Beach County projects that comprise the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project, are expected to be reconstructed approximately every 3-4 years. Therefore, some direct impacts are considered permanent (i.e. buried for all 3 years post-construction), while some will be temporary (covered less than 3 years). Once sand begins equilibrating, indirect impacts will be incurred as hardbottom outside the CTOF is buried for a period of time as sand moves offshore and/or downdrift from the Project Area. Modeling has estimated the locations of sediment accumulation at 1, 2 and 3 years post construction in the form of polygons that were plotted in GIS (Figure 4-1). At 3 years post-construction, it is assumed that the project may be reconstructed, and the impacts will be repeated. Permanent and temporary impacts are defined as follows.

- Permanent = Permanent impacts are those that, following placement of fill, will result in hardbottom burial for at least 3 years, at which time the project may be constructed again. Based on modeling results, these are areas which were shown to have sand accumulation present at 1, 2 and 3 years post-construction and are not expected to become re-exposed for the duration of the project. These areas are considered to have lost most, but not all, of their ecological function. While these areas will be subject to increased sand cover, this habitat is already ephemeral in nature; therefore, the habitat will continue to provide ecological function to motile species such as fish, sea turtles and crabs. Impacts will be mitigated through construction of an artificial reef. Permanent impacts may be located within the CTOF and in areas beyond the CTOF.
- *Temporary* = Temporary impacts are those that, following placement of fill, are expected to be buried for less than 3 years, which allows these resources to

regain ecological function for the period of time when they are re-exposed. These temporary impacts will be repeated following construction of each project, potentially every 3-4 years. Based on previous guidance provided by Florida Department of Environmental Protection (FDEP), temporary impacts can be considered as partially self-mitigating; when conducting UMAM analyses on areas of temporary impact, minimum risk is used and once the total mitigation is initially calculated, then the temporary impact acreage is subtracted from this total in order to determine the additional mitigation required to offset the temporary impact (L. Edwards and V. Kosmynin, pers. comm., 2013).

In addition to the modeling results predicting the movement of sand following project construction, an equilibrium toe of fill (ETOF) analysis was performed. While the modeling results include both offshore and downdrift movement, the traditionally-used ETOF analysis included an area that encompassed a larger cross-shore area; therefore, it is assumed that impacts may also occur to this area. This area was used to quantify the *secondary* impact area (Figure 4-1). These secondary impacts are considered as a degradation of a community, but not a total loss of function, that could result from increased sedimentation (L. Edwards and V. Kosmynin, pers. comm., 2013).

# 2.0 SEVEN HARDBOTTOM IMPACT TYPES

Based on the modeling and ETOF analyses, seven (7) types of impacts to hardbottom were defined for the purpose of this UMAM evaluation. These seven impact types and the associated mitigation determined by UMAM are summarized below and in Table 1 and Figure 4-1:

 Permanent = Permanent impacts include areas where the sand is expected to remain for at least 3 years. This includes areas within the CTOF following direct placement during construction and areas offshore and/or downdrift which, although outside the CTOF and not directly impacted at the time of fill placement, are expected to become buried by 1-year post-construction and remain buried through 3 years post-construction. These impacts are considered permanent since the project may be reconstructed every 3-4 years. Permanent impacts were calculated by summing the areas shown to have overlapping sediment accumulation polygons at 1, 2 and 3 years post-construction based on the modeling results. These areas are considered to have lost most, but not all, of their ecological function. Based on the preliminary UMAM analysis, this type of impact will be mitigated at a ratio of approximately 1 ac impact:1.16 ac of mitigation (1:1.20 ac using FDEP time lag).

- 2. Direct Temporary (<1 Year) = This area will be impacted within the CTOF by direct placement of fill at the time of construction, but is expected to become re-exposed within the first year following construction. For this analysis, it is estimated that the hardbottom will be re-exposed within 1 year following project construction and will remain exposed until the project is reconstructed. This impact area was calculated by taking the total area of exposed hardbottom within the CTOF and subtracting areas shown to have sediment accumulation polygons at 1, 2 and/or 3 years post-construction based on the modeling results. This type of impact is partly self-mitigating (i.e. will become re-exposed), and based on the preliminary UMAM analysis, will likely require mitigation at a ratio of approximately 1 ac impact:0.03 ac of mitigation (1:0.07 ac using FDEP time lag).</p>
- 3. Direct Temporary (>1 Year) = This area will be impacted within the CTOF by direct placement of fill at the time of construction, but is expected to become re-exposed within the second year following construction. For this analysis, it is estimated that the hardbottom will be buried for more than 1 year (but less than 2 years) following project construction and will become re-exposed until the project is reconstructed. This impact area was calculated by summing the area within the CTOF shown to have sediment accumulation polygons at 1, 2 or 3 years post-construction (with no overlap between years) based on the modeling results. This type of impact is partly self-mitigating, and based on the preliminary UMAM analysis, will likely require additional mitigation at a ratio of approximately 1 ac impact:0.32 ac of mitigation (1:0.38 ac using FDEP time lag).

- 4. Direct Temporary (>2 Years) = This area will be impacted within the CTOF by direct placement of fill at the time of construction, but is expected to become reexposed within the third year following construction. For this analysis, it is estimated that the hardbottom will be buried for more than 2 years (but less than 3 years) following project construction and will become re-exposed until the project is reconstructed. This impact area was calculated by summing the area within the CTOF shown to have sediment accumulation polygons that overlap for two years based on the modeling results. This type of impact is partly self-mitigating, and based on the preliminary UMAM analysis, will likely require additional mitigation at a ratio of approximately 1 ac impact:0.85 ac mitigation (1:0.93 ac using FDEP time lag).
- 5. *Indirect Temporary (1 Year)* = This area, located outside the CTOF, will be temporarily impacted for 1 year by spreading of sand, but will become re-exposed prior to project reconstruction. This impact area was calculated by summing the area beyond the CTOF shown to have sediment accumulation polygons during 1, 2 or 3 years post-construction (with no overlap between years) based on the modeling results. This type of impact is partly self-mitigating, and based on the preliminary UMAM analysis, will likely require additional mitigation at a ratio of approximately 1 ac impact:0.16 ac mitigation (1:0.20 ac using FDEP time lag).
- 6. Indirect Temporary (2 Years) = This area, located outside the CTOF, will be temporarily impacted for 2 years by spreading of sand, but will become re-exposed prior to project reconstruction. This impact area was calculated by summing the area beyond the CTOF shown to have sediment accumulation polygons that overlap for two years (e.g. overlap of 1- and 2-year, 2- and 3-year, or 1- and 3-year post-construction) based on the modeling results (with overlap between two years). This type of impact is partly self-mitigating, and based on the preliminary UMAM analysis, will likely require additional mitigation at a ratio of approximately 1 ac impact: 0.55 ac mitigation (1:0.61 ac using FDEP time lag).

7. Secondary = This area represents an impact area associated with the traditional equilibrium toe of fill (ETOF) and was not entirely predicted to be impacted based on modeling results. Although the project was modeled to account for direct and indirect impacts as discussed above, the ETOF was used to quantify the area where secondary impacts may occur due to increased sedimentation. This provides a conservative estimate of total impacts by including both cross-shore and downdrift estimates. The areas that were already accounted for from the modeling polygons were subtracted from the area of the ETOF so as not to "double dip". Areas that may experience secondary impacts are not expected to become buried, but effects may include slightly impaired ecological function. Based on the preliminary UMAM analysis, secondary impacts will likely require mitigation (artificial reef) at a ratio of approximately 1 ac impact:0.13 ac mitigation (also 1:0.13 ac using FDEP time lag).

# 3.0 DETAILS OF INPUT FOR UMAM EVALUATION AND ASSOCIATED MITIGATION REQUIRED FOR EACH IMPACT TYPE

Each of the seven types of impact received a separate UMAM evaluation which accounted for the nature of the impact (direct, indirect and secondary) and the duration of the impact (permanent and temporary). It is assumed that mitigation will be in the form of an artificial reef. Based on the ephemeral nature of the nearshore hardbottom in the impact area (low complexity, dominated by turf and macroalgae), it is expected that the artificial reef will completely resemble the hardbottom habitat within 3 years. Therefore, the time lag (t-factor) was set to 1.03 for all evaluations based on USACE time lag guidelines (the FDEP uses a t-factor of 1.07 for 3 years). The UMAM forms for each impact type associated with the Applicants' Preferred Alternative are attached. Sub-Appendix H-1 provides the UMAM evaluation for the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project using modeling and engineering results for both the Town of Palm Beach and County projects considered together. In order to assist with the permitting of the projects, which must be permitted separately for the Town of Palm Beach and the County, the projects were also modeled as standalone projects. Based on these results, separate UMAM evaluations were conducted and are

provided as Sub-Appendices H-2 (for Town of Palm Beach project) and H-3 (for County project). For each of the three attached UMAM evaluations, Part I – Qualitative Descriptions are provided for the impact and mitigation areas, followed by Part II – Qualification of Assessment Areas for the impact and mitigation areas associated with each of the seven impact types. The final page of each evaluation shows the formulas used to calculate the mitigation acreage required for each impact type and the total mitigation required for each project. The parameters used for each UMAM evaluation are summarized below and in Table 1. Figure 4-1 illustrates the seven impact types determined for the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project.

It is important to note that although permanent and temporary impacts to the nearshore hardbottom resources are anticipated, not all functional value will be lost. The expected remaining functional value is represented by the assigned value of one (1) for the "with project" natural hardbottom resources in the (a) Location and Landscape Support and the (c) Benthic Community for impact types 1 through 6. The softbottom habitat and marine water column above this substrate could still provide functions and services to the nearshore environment. The marine water column will continue to serve as a medium of transport for nutrients, migrating organisms and larvae of crustacean and fish species (SAFMC, 1998) and the sand substrate provides habitat for several fish, benthic and infaunal species; therefore, it is not a complete loss.

### 1. Permanent:

<u>Impact Area</u>: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" value was reduced to one in the (a) Location and Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: To determine the required mitigation, a "without mitigation" value of 0 and "with mitigation" value of 10 were assigned to (a) Location and Landscape Support and (c) Benthic Community ((b) Water Environment was unchanged). The risk factor

was set at 1.25, accounting for the slight uncertainty that the artificial reef will successfully mimic the impact area.

<u>Mitigation Required</u>: 1 acre of permanent impact will require 1.16 ac of mitigation (1.20 ac using FDEP time lag).

### 2. Direct Temporary (< 1 Year):

<u>Impact Area</u>: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" was reduced to one in the (a) Location and Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: This area of hardbottom will be directly impacted due to sand placement but will remain buried for less than 1 year, therefore it is designated as a temporary impact and considered partially self-mitigating. The impacted ephemeral hardbottom community will be re-exposed, but may not return to the exact same condition; therefore, the "with mitigation" value was set at 9, indicating that less than 1 year of burial may leave the re-exposed habitat functioning slightly (1 unit) below its preimpact state. Because this area is considered partially self-mitigating, the UMAM output is subtracted from the original impact area and the remaining area represents the acreage of artificial reef required to offset the temporary impact. Unlike the "direct permanent" impact parameters, the risk factor for less than 1 year of temporary impacts is set to 1.00 to account for the re-exposure that will occur in this area.

<u>Mitigation Required</u>: 1 acre of less than 1 year of direct temporary impact will require 0.03 ac of mitigation (0.07 ac using FDEP time lag).

### 3. Direct Temporary (>1 Year):

Impact Area: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" was reduced to one in the (a) Location and

Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: This area of hardbottom will be directly impacted due to sand placement but will remain buried for more than 1 year (but less than 2 years), thus it is designated as a temporary impact and considered partially self-mitigating. The impacted ephemeral hardbottom community will be re-exposed, but may not return to the exact same condition; therefore, the "with mitigation" value was set at 7 to account for more than 1 year of burial. Because this area is considered selfmitigating, the UMAM output is subtracted from the original impact area and the remaining area represents the acreage of artificial reef required to offset the temporary impact. The risk factor for temporary impacts is set to 1.00 to account for the re-exposure that will occur in this area.

<u>Mitigation Required</u>: 1 acre of more than 1 year of direct temporary impact will require 0.32 ac of mitigation (0.38 ac using FDEP time lag).

### 4. Direct Temporary (>2 Years):

Impact Area: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" was reduced to one in the (a) Location and Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: This area of hardbottom will be directly impacted due to sand placement but will remain buried for more than 2 years (but less than 3 years), thus it is designated as a temporary impact and considered partially self-mitigating. The impacted ephemeral hardbottom community will be re-exposed, but may not return to the exact same condition; therefore, the "with mitigation" value was set at 5 to account for more than 2 years of burial. Because this area is considered selfmitigating, the UMAM output is subtracted from the original impact area and the remaining area represents the acreage of artificial reef required to offset the temporary impact. The risk factor for temporary impacts is set to 1.00 to account for the re-exposure that will occur in this area.

<u>Mitigation Required</u>: 1 acre of more than 2 years of direct temporary impact will require 0.85 ac of mitigation (0.93 ac using FDEP time lag).

### 5. Indirect Temporary (1 Year):

<u>Impact Area</u>: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" was reduced to one in the (a) Location and Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: This area of hardbottom will be impacted due to sand spreading after initial placement and it is assumed that this area will remain buried for 1 year, thus it is designated as a temporary impact and considered self-mitigating. The impacted ephemeral hardbottom community will be re-exposed, but may not return to the exact same condition; therefore, the "with mitigation" value was set at 8, indicating that 1 year of burial may leave the habitat functioning two units below its pre-impact state. Because this area is considered partially self-mitigating, the UMAM output is subtracted from the original impact area and the remaining area represents the acreage of artificial reef required to offset the temporary impact. The risk factor for temporary impacts is set to 1.00 to account for the re-exposure that will occur in this area.

<u>Mitigation Required</u>: 1 acre of 1 year of indirect temporary impact will require 0.16 ac of mitigation (0.20 ac using FDEP time lag).

### 6. Indirect Temporary (2 Years):

Impact Area: The "without project" natural hardbottom resources were assigned a value of 10 and the "with project" was reduced to one in the (a) Location and

Landscape Support and the (c) Benthic Community to account for the loss of most, but not all, function ((b) Water Environment was unchanged).

<u>Mitigation</u>: This area of hardbottom will be impacted due to sand spreading after initial placement and it is assumed that this area will remain buried for 2 years, thus it is designated as a temporary impact and considered self-mitigating. The impacted ephemeral hardbottom community will be re-exposed, but may not return to the exact same condition; therefore, the "with mitigation" value was set at 6 to account for 2 years of burial. Because this area is considered partially self-mitigating, the UMAM output is subtracted from the original impact area and the remaining area represents the acreage of artificial reef required to offset the temporary impact. The risk factor for temporary impacts is set to 1.00 to account for the re-exposure that will occur in this area.

<u>Mitigation Required</u>: 1 acre of 2 years of indirect temporary impact will require 0.55 ac of mitigation (0.61 ac using FDEP time lag).

### 7. Secondary:

Impact Area: In UMAM, the "without project" natural hardbottom resources were assigned a value of 10 and the "with project" value was reduced to 9 in the (a) Location and Landscape Support and the (c) Benthic Community to account for the potential reduction in ecological function of the hardbottom which may occur as a result of increased sedimentation over the ephemeral hardbottom ((b) Water Environment was unchanged).

<u>Mitigation</u>: It is anticipated that secondary impacts will result in a minimal reduction in function to the ephemeral hardbottom; therefore, the "with mitigation" value was set at 10 for (a) Location and Landscape Support and (c) Benthic Community ((b) Water Environment was unchanged). The risk factor was set at 1.25, accounting for the slight uncertainty that the artificial reef will successfully mimic the impact area. <u>Mitigation Required</u>: 1 acre of secondary impact will require 0.13 ac of mitigation (also 0.13 ac using FDEP time lag).

# 4.0 SUMMARY

The UMAM methodology described herein was applied to Alternatives 2 through 6 for evaluation within the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project Draft EIS. Impact acreages and associated mitigation required for each impact type for each alternative are presented in Chapter 4, Table 4-1.

Table 4-1. Summary of seven hardbottom impact types, before and after mitigation UMAM scores, and mitigation required per 1 acre of impact using the USACE and FDEP time lag values.

	Before	e and after mi	tigation	Mitigation required for 1 acre impact (assuming 3 years for artificial reef to function as impact area)			
Impact Type	Without Impact	With Impact	With Mitigation (artificial reef and/or re- exposure)	Risk Factor	USACE Time Lag = 1.03	FDEP Time Lag = 1.07	
1. Permanent	10	1	10	1.25	1.16	1.20	
2. Direct Temporary (< 1 year)	10	1	9	1.00	0.03	0.07	
3. Direct Temporary (> 1 years)	10	1	7	1.00	0.32	0.38	
4. Direct Temporary (> 2 years)	10	1	5	1.00	0.85	0.93	
5. Indirect Temporary (1 year)	10	1	8	1.00	0.16	0.20	
6. Indirect Temporary (2 years)	10	1	6	1.00	0.55	0.61	
7. Secondary (ETOF)	10	9	10	1.25	0.13	0.13	

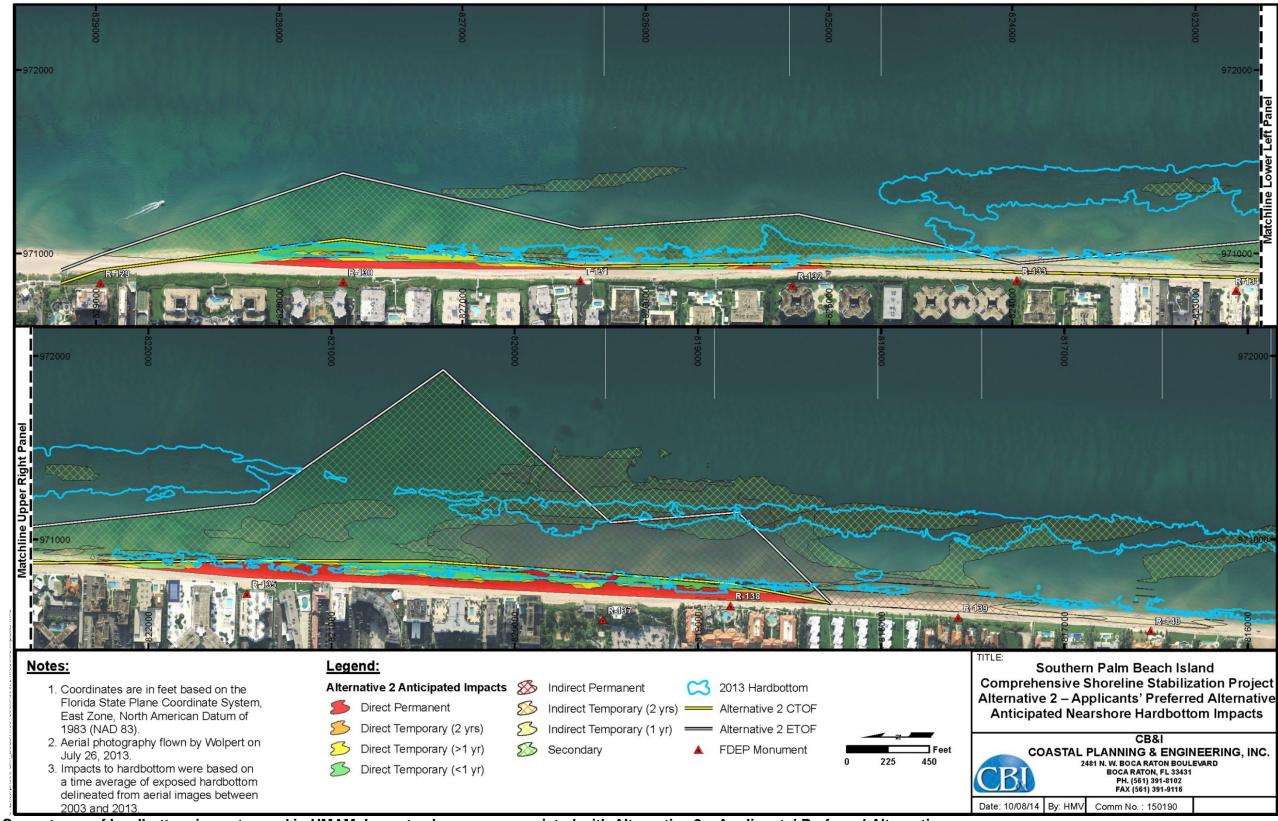


Figure 4-1. Seven types of hardbottom impacts used in UMAM. Impacts shown are associated with Alternative 2 – Applicants' Preferred Alternative.

Southern Palm Beach Island Comprehensive Shoreline Stabilization Project Draft Environmental Impact Statement

# 5.0 LITERATURE CITED

Edwards, L. and V. Kosmynin. 2013. Personal communication between Lainie Edwards and Vladimir Kosmynin (FDEP) and Stacy Buck (CB&I) regarding temporary and secondary impacts in the UMAM analyses.

South Atlantic Fishery Management Council (SAFMC). 1998. Final habitat plan for the South Atlantic region: Essential Fish Habitat requirements for fishery management plans of the South Atlantic Fishery Management Council. 457 p.

### SUB-APPENDIX H-1

### DRAFT UMAM ANALYSIS

### TOWN OF PALM BEACH AND PALM BEACH COUNTY

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

Site/Project Name	bers		Assessment Area Name or Number							
Southern Palm Beach Island					alm Beach SAJ-					
Comprehensive Shore Sta		8 <sup>.</sup> Palm Beach		Intertidal and Nearshore Subtidal Hardbottom						
(Town of Palm Beach and	Palm Bea	ach		J-2008-04086		Resources				
County combined)	2000 0 1									
FLUCCs code Further classification (optional				)	Impact or N	litigation Site?	Assessment Ar	rea Size		
								acres (includes 7 impact		
571		N/A			Impact 3	Site	12.16	types, see Part II forms for		
					•			each)		
Basin/Watershed Name/Number	ass)	Special (	lassification		acal/state/federal d	lesignation of importance)				
Atlantic Ocean	N/A	lassification	(I.e. OFW, AF, Other Id	Juai/State/Teuerar u	lesignation of importance)					
	Class III			1.0/1						
Geographic relationship to and hydrolo		n with woth	nda othar aurfaar	water upland	<u>_</u>					
				les south of La	ke Worth Inle	et and approximately 2.5 miles				
Assessment area description										
The hardbottom environment	adjacent t	o the pro	ect area is hid	hly ephem	eral, cons	isting primarilv	of low-relief	intertidal and subtidal		
hardbottom habitat, located in										
macroalgae, but also support	-			•			•			
and crabs also utitilize this ha	abitat. Spe	cies are a	ccustomed to	the epherr	neral natur	e of the habitat	which is sub	pject to frequent burial and re-		
exposure.										
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)						
The outer reef (beyond the im	npact area)	) is locate	d east of	Somewhat unique; the intertidal portion of the hardbottom ridge terminates to						
the nearshore natural hardbor	ttom habita	at in 40-7	0 ft water	the north a	f the proje	ect area.		-		
depth.										
		Mitigation for previous permit/other historic use								
Functions		previous perr	nit/other historic use	9						
Provides cover, substrate, refuge and food resources for				N/A						
benthic and motile marine species.										
Anticipated Wildlife Utilization Based on Literature Review (List of species that				Anticipated Ut	ilization by Li	isted Species (List s	pecies, their leg	al classification (E, T, SSC), type of use,		
are representative of the assessment area and reasonably expected to be			ected to be	and intensity o	of use of the a	assessment area)				
found) Benthic characterization surve	ovo within	the proje	at area	Loggerhead (Caretta caretta) (T), Green (Chelonia mydas) (E), and						
revealed the dominant compo	•			leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the						
communities to be turf and m				project area. The project area is also loggerhead critical habitat (terrestrial and						
tunicates, octocorals, bryozoa				marine) . The Florida manatee ( <i>Trichechus manatus latirostris</i> ) (E) is common						
present. Common macroalga	l taxa are	Dictyota,		in Palm Beach County. Smalltooth sawfish (Pristis pectinata) (E) has the						
Hypnea, Dasycladus, Halime				potential to occur in the project area. Threatened coral species which have the						
cm) colonies of scleractinian				potential to occur in the project area but which have not been observed during						
on the nearshore hardbottom				recent benthic survyes include: staghorn coral (Acropora cervicornis), elkhor coral (A. nalmata), boulder star coral (Orbicella annularis), mountainous sta						
and Solenastrea bournoni. Co Pterogorigia, Muricea, and E				coral (A. palmata), boulder star coral (Orbicella annularis), mountainous sta coral (O. faveolata), star coral complex (O. franski), pillar coral (Dendrogyra						
fish, sea turtles and crabs als				cylindrus), and rough cactus coral (Mycetophyllia ferox).						
are accustomed to the epher										
· ·										
Observed Evidence of Wildlife Utilizati	ion (List speci	ies directly c	bserved, or other	r signs such as tracks, droppings, casings, nests, etc.):						
Characterization surveys d	locumente	ed the bi	ota listed ab	ove.						
Additional relevant factors:										
Additional relevant factors:	omeral P		olinostia(	oriola +	o hoo h	n o timo aver-	and 00 05 c -	of ovpood hardhattar		
The hardbottom in highly eph between R-127 and R-141 from							-	-		
								ore hardbottom adjacent to R-		
				d ratio of 24:76 (24% of the area east of the hardbottom edge is hardbottom and tion surveys were conducted in 2005, 2006, 2007, 2011, and 2014.						
Assessment conducted by:				Assessment of	late(s):					
CB&I Coastal Planning & Eng	aineerina I	Inc.		October 20						
	,			<b>L</b>						

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

Site/Project Name		۸.	polication Number			Assessment Area	Name or Numbr	or.		
,		А	pplication Number			Assessment Afea	INAME OF NUMBE	51		
Southern Palm Beach Island	own of Palm	Beach	SAJ-							
Comprehensive Shore Stabiliz		08; Palm Beach		Mitigation Re	eef					
(Town of Palm Beach and Pal	ounty SAJ-2			5						
County combined)	,									
FLUCCs code	Fur	rther classifie	cation (optional)		Impact or M	litigation Site?	Assessment A	rea Size		
								acres (mitigation for 7 impact		
571	N/	A			Mitigatio	n Site	6.39	types, see Part II forms for		
					Ű			each)		
Basin/Watershed Name/Number Affe	ected Water	body (Class	)	Special C	lassification	(i.e. OFW AP other	local/state/federal o	lesignation of importance)		
	ass III	body (class	·)	N/A	labomoation					
	000 m			1.1/7						
Geographic relationship to and hydrologic o										
Open waters of the Atlantic Ocea	an. The pi	roject are	a is located ap	proxima	tely 11 mi	les south of La	ike Worth Inle	et and approximately 2.5 miles		
north of South Lake Worth Inlet.										
Assessment area description										
Subtidal limestone boulder artific	cial reefs a	are propo	sed to be depl	oyed in t	he same	general vicinity	and water d	epth as the impact area in a		
location devoid of hardbottom ha						• •				
determine the location of the miti		•								
Significant nearby features			Un	iqueness (c	onsidering th	ne relative rarity in r	elation to the reg	ional landscape.)		
The outer reef is located east of	ural Th	The artificial reefs will be placed in similar water depths as the impacted								
hardbottom habitat in 40-70 ft water depth.				hardbottom in order to mimic the lost function of the habitat.						
	-									
Functions			Mit	idation for r	vrevious perr	nit/other historic us	٩			
The artificial reef habitat is intend	ded to clo	solv mimi					0			
characteristics of adjacent nears		•								
typically low relief limestone pave										
substrate, refuge and food resou										
Anticipated Wildlife Utilization Based on Lit	terature Rev	iew (List of s	species that An	ticipated Ut	ilization by L	isted Species (List	species, their leg	al classification (E, T, SSC), type of use,		
are representative of the assessment area						assessment area)				
found)										
The artificial reef is intented to re	•							onia mydas) (E), and		
appearance, texture, relief and ed	cological	function of		leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the project area. The project area is also loggerhead critical habitat (terrestrial and						
habitat it is meant to replace.										
				marine). The Florida manatee ( <i>Trichechus manatus latirostris</i> ) (E) is common in Palm Beach County. Smalltooth sawfish ( <i>Pristis pectinata</i> ) (E) has the						
				potential to occur in the project area. Threatened coral species which have the						
				potential to occur in the project area but which have not been observed during						
				recent benthic survyes include: staghorn coral ( <i>Acropora cervicornis</i> ), elkhorn coral ( <i>A. palmata</i> ), boulder star coral ( <i>Orbicella annularis</i> ), mountainous star						
								ski), pillar coral (Dendrogyra		
			су	lindrus),	and roug	h cactus coral	(Mycetophyll	ia ferox).		
Observed Evidence of Wildlife Utilization (I	List species	directly obse	erved, or other sig	ns such as	tracks, dropp	oings, casings, nest	s, etc.):			
Characterization surveys docume	ented the	biota liste	ed above for n	atural ne	arshore h	ardbottom. Uti	lization of art	ificial reef is expected to be		
similar to that of natural hardbotte										
Additional relevant factors:										
Limestone is a natural material a	•		•		•					
reefs have been documented to o	onset imp	Dacts asso	oclated with be	each nou	nsnment	projects in sou	meast Florida	a.		
Assessment conducted by:			As	sessment d	ate(s):					
CB&I Coastal Planning & Engine	erina. Inc			ctober 20						
g	3,									
Form 62-345.900(1), F.A.C. [effective date	el									

SPBICSSP - Town of Palm Bea	ch and County	Application Number Town SAJ-2005-0	7908; County	Assessment Area Name or Number Permanent Impacts				
Impact or Mitigation Impact (Permanent)		SAJ-2008-04086 Assessment conducte CB&I		Area (acres) 4.				
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 wetlands/surface water functions	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of su wetland /surface functions	pport of	Condition is insuf	Not Present (0) ficient to provide wetland/surface water functions		
.500(6)(a) Location and Landscape Support w/o pres or current with 10 1	and colonized pave components of the tunicates, scleracti <i>Padina, Hypnea, L</i> documented on the octocorals are <i>Pte</i> , and nursery habita	ement. Benthic character epibenthic communitien nian corals, octocorals, oasycladus, Halimeda, e nearshore hardbottom rogorigia, Muricea, and t for immigrating larvae	erization surveys is s to be turf and m bryozoans, and z and <i>Laurencia</i> . Su n, including <i>Sidera</i> <i>Eunicea</i> . The ne of many importar	within th acroalg coanthid mall (<3 astrea s arshore nt fisheri	e project area rev ae, and also supp s. Common macro cm) colonies of s pp. and <i>Solenastr</i> hardbottom provid es species. It is al	orting wormrock, sponges, balgal taxa are <i>Dictyota,</i> cleractinian corals have been		
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 6 6		rea is in the nearshore with generally clear wat				ulation. It is often exposed to		
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 10 1	organisms thriving macroalgae assem scleractinian corals	in this habitat for many ablage and a diverse in s, octocorals, bryozoans nd <i>Solenastrea bourno</i>	years (scleractini vertebrate commu s, and zoanthids.	ans, lar inity in tl The mos	ge sponges). It su he form of wormro st abundant sclera	ock, sponges, tunicates,		
Score = sum of above scores/30 (if uplands, divide by 20) current or w/o pres with 0.867 0.267	If preservation as mitigation,       For impact assessment areas         Preservation adjustment factor =       FL=delta x acres=       2.415338302         Adjusted mitigation delta =       FL=delta x acres=       2.415338302							
Delta = [with - current]	If mitigation Time lag (t-fa	actor) =			For mitigation	assessment areas		

Site/Project Na	ame			Application Number		Assess	Assessment Area Name or Number		
SPBICSSP	- Town	of Palm Bea	ach and County	Town SAJ-2005-0		Mitiga	ation for Permanent Impacts		
Impact or Mitig			,	County SAJ-2008-04086					
Mitigation	gation			CB&I	Assessment conducted by: Assessment date: CB&I Oct. 2014				
Scoring Gu			Optimal (10)	Moderate (7)	Minima	al (4)	Not Present (0)		
The scoring indicator is base			Condition is optimal and	Condition is less than optimal, but sufficient to	Minimal I				
would be suita			fully supports wetlands/surface water	maintain most	support of /surface		Condition is insufficient to provide wetland/surface water functions		
type of wetland water asso			functions	wetland/surface water functions	functi	ons			
.500(6)(a) Lo w/o pres or current 0	ocation and Support	d Landscape with 10	similar water depth		arshore ha	rdbottom	onsolidated sandy substrate in n resources exist in the adjacent al reef.		
.500(6)(b) Wa f w/o pres or current 6	ater Enviro for uplands						ic Ocean with open circulation. It is Water quality will not be not altered.		
1. Ve	Communit egetation a nthic Comr		invertebrates and w foraging resource for	ill create a refuge for fis	h and othe erred macr	er motile oalgae h	of macroalgae and sessile marine organisms. It will create a nave been documented to grow on		
Score = sun	n of above s	cores/30 (if							
uplar	nds, divide b	y 20)	If preservation as	s mitigation,		<u> </u>	For impact assessment areas		
current or w/o pres	I	with	Preservation adj Adjusted mitigati			FL=d	elta x acres=		
0.200		0.867							
			If mitigation			F	or mitigation assessment areas		
Delta =	= [with - d	current]	Time lag (t-fa	ictor) =	1.03	<u> </u>	0.52		

0.667

Risk factor =

RFG=delta/(t-factor x risk)=

#### Mitigation Determination Formulas (See Section 62-345.600(3), F.A.C.)

For each impact assessment area:

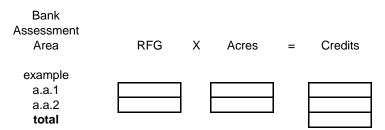
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

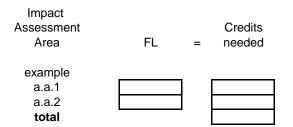
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



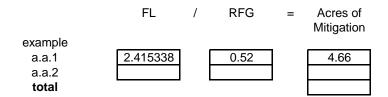
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

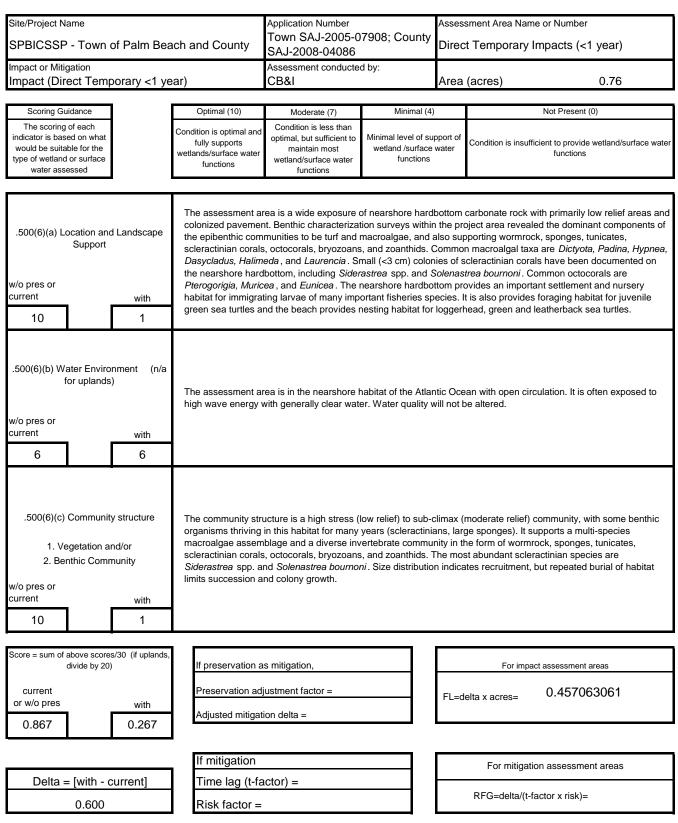


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



Site/Project Name		Application Number		Assess	sment Area Name or Number		
SPBICSSP - Town of Palm Bea	ach and County	Town SAJ-2005-0 SAJ-2008-04086	7908; County	-	Mitigation for Direct Temp Impacts (<1 yr)		
Impact or Mitigation		Assessment conducted	d by:	Assess	sment date:		
Mitigation		CB&I		Oct. 2	2014		
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4	l)	Not Present (0)		
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetlands/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of se wetland /surface functions	e water	Condition is insufficient to provide wetland/surface water functions		
.500(6)(a) Location and Landscape Support w/o pres or current with 0 9	water depth as the		hardbottom res		lated sandy substrate in similar xist in the adjacent area to facilitate		
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 6 6					an with open circulation. It is often ity will not be not altered.		
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 0 9	notile marine org	anisms.	croalgae and sessile invertebrates It will create a foraging resource for row on artificial reefs in the				
Score = sum of above scores/30 (if			1				
uplands, divide by 20)	If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres with 0.200 0.800	w/o pres with Adjusted mitigation delta =						
	If mitigation			F	or mitigation assessment areas		
Delta = [with - current]	Time lag (t-fa	actor) =	1.03	DEC	0.58		
0.600	Risk factor =		1.00	KFG=(	delta/(t-factor x risk)=		

#### Mitigation Determination Formulas (See Section 62-345.600(3), F.A.C.)

For each impact assessment area:

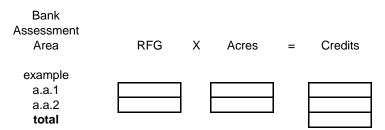
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

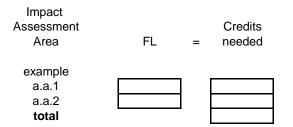
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



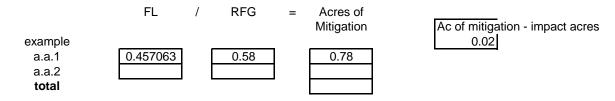
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

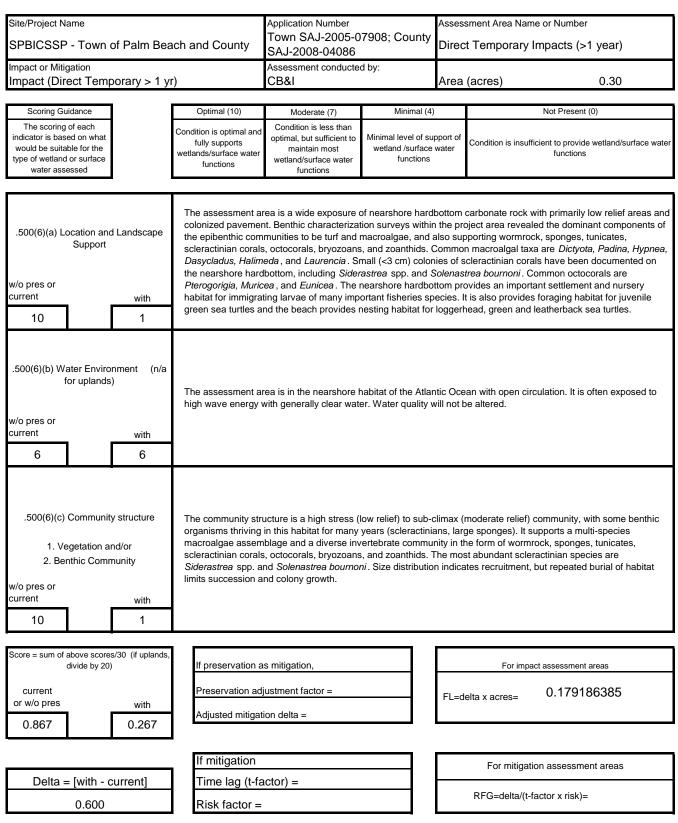


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



.500(6)(a) Location and Landscape Support	Coptimal (10) Optimal (10) Condition is optimal and fully supports wetlands/surface water functions The mitigation area water depth as the i recruitment to the p	impact area. Nearshore roposed mitigative artifi ea is in the nearshore h	d by: Minimal (4 Minimal level of su wetland /surface functions	Mitigat Impact Assessn Oct. 20	nent Area Name or Number tion for Direct Temp ts (>1 yr) nent date: 014 Not Present (0) Condition is insufficient to provide wetland/surface water functions ted sandy substrate in similar st in the adjacent area to facilitate n with open circulation. It is often	
Mitigation         Scoring Guidance         The scoring of each         indicator is based on what         would be suitable for the         type of wetland or surface         water assessed         .500(6)(a) Location and Landscape         Support         with         0         7         .500(6)(b) Water Environment (n/a for uplands)	Condition is optimal and fully supports wetlands/surface water functions The mitigation area water depth as the i recruitment to the p	CB&I Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions is shallow water nearsh impact area. Nearshore roposed mitigative artifi	Minimal (4 Minimal level of su wetland /surface functions	Oct. 20	014 Not Present (0) Condition is insufficient to provide wetland/surface water functions ted sandy substrate in similar st in the adjacent area to facilitate	
The scoring of each       Ca         indicator is based on what       would be suitable for the         type of wetland or surface       water assessed         .500(6)(a) Location and Landscape       Support         w/o pres or       with         0       7         .500(6)(b) Water Environment (n/a for uplands)	Condition is optimal and fully supports wetlands/surface water functions The mitigation area water depth as the i recruitment to the p	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions is shallow water nearsh impact area. Nearshore roposed mitigative artifi	Minimal level of su wetland /surface functions	upport of water	Condition is insufficient to provide wetland/surface water functions	
indicator is based on what would be suitable for the type of wetland or surface water assessed .500(6)(a) Location and Landscape Support w/o pres or current with 0 7 .500(6)(b) Water Environment (n/a for uplands)	fully supports wetlands/surface water functions The mitigation area water depth as the i recruitment to the p The assessment are	optimal, but sufficient to maintain most wetland/surface water functions is shallow water nearsh impact area. Nearshore roposed mitigative artifi	wetland /surface functions	e water consolidat urces exis	wetland/surface water functions	
Support w/o pres or current with 0 7 .500(6)(b) Water Environment (n/a for uplands)	water depth as the i recruitment to the p	impact area. Nearshore roposed mitigative artifi ea is in the nearshore h	hardbottom reso cial reef.	urces exis	st in the adjacent area to facilitate	
for uplands)			abitat of the Atlar	ntic Ocean	n with open circulation. It is often	
with     6	exposed to high wa	ve energy with generall	y clear water. Wa		will not be not altered.	
	and will create a ref	uge for fish and other meter red macroalgae hav	notile marine orga	anisms. It v	balgae and sessile invertebrates will create a foraging resource for w on artificial reefs in the	
Score = sum of above scores/30 (if						
uplands, divide by 20)	If preservation as	s mitigation,			For impact assessment areas	
current or w/o pres with	Preservation adjustment factor = FL=delta x acres=				ta x acres=	
0.200 0.667						
	If mitigation			For	r mitigation assessment areas	
Delta = [with - current]	Time lag (t-fa	ictor) =	1.03			
0.467	$\frac{\text{RFG=delta/(t-factor x risk)=}}{\text{RFG=delta/(t-factor x risk)=}}$					

#### Mitigation Determination Formulas (See Section 62-345.600(3), F.A.C.)

For each impact assessment area:

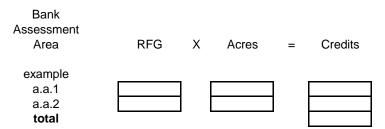
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

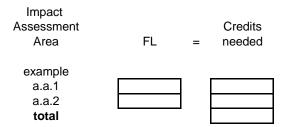
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



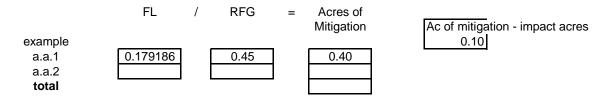
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

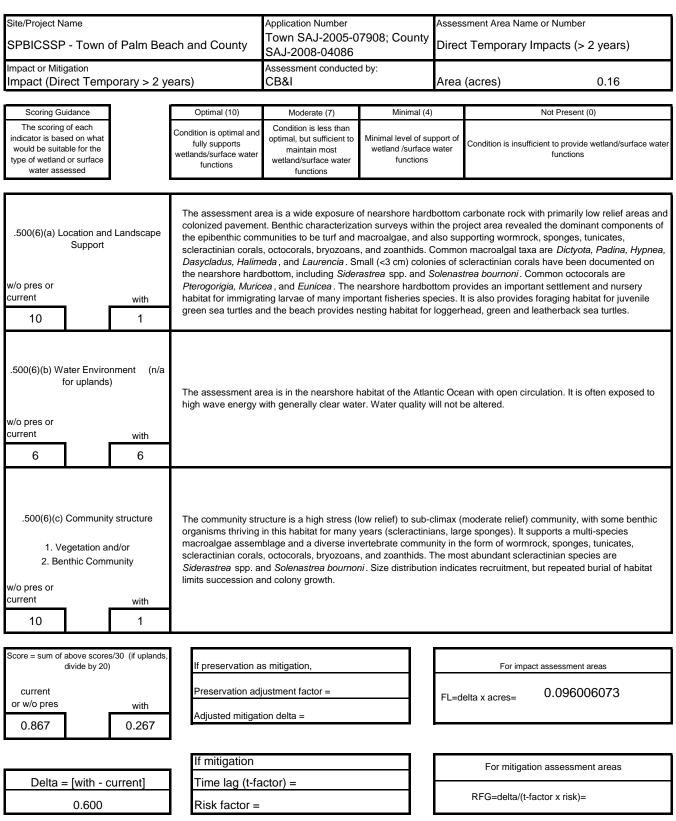


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



water depth as th	optimal, but sufficient to		Impac Assessr Oct. 20	tion for Direct Temp ts (>2 yr) ment date: 014 Not Present (0) Condition is insufficient to provide wetland/surface water functions
Mitigation         Scoring Guidance         The scoring of each         indicator is based on what         would be suitable for the         type of wetland or surface         water assessed         .500(6)(a) Location and Landscape         Support         The mitigation ar         water depth as th	CB&I Moderate (7) nd Condition is less than optimal, but sufficient to maintain most wetland/surface water	Minimal (4 Minimal level of su wetland /surface	Assessr Oct. 20	ment date: 014 Not Present (0) Condition is insufficient to provide
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed .500(6)(a) Location and Landscape Support The mitigation ar water depth as th	nd Condition is less than optimal, but sufficient to maintain most wetland/surface water	Minimal level of su wetland /surface	pport of	Condition is insufficient to provide
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed .500(6)(a) Location and Landscape Support The mitigation ar water depth as th	nd Condition is less than optimal, but sufficient to maintain most wetland/surface water	Minimal level of su wetland /surface	pport of	Condition is insufficient to provide
Support The mitigation ar water depth as the				
v/o pres or current with 0 5		e hardbottom reso		ated sandy substrate in similar ist in the adjacent area to facilitat
	area is in the nearshore h wave energy with general			n with open circulation. It is ofter ty will not be not altered.
1. Vegetation and/or and will create a sea turtles since	refuge for fish and other r	motile marine orga	anisms. It	oalgae and sessile invertebrates will create a foraging resource for ow on artificial reefs in the
			-	
Score = sum of above scores/30 (if uplands, divide by 20) If preservation	as mitigation,			For impact assessment areas
or w/o pres with Adjusted mitig	adjustment factor =		FL=del	lta x acres=
0.200 0.533			8	
If mitigation	1		Fo	r mitigation assessment areas
Delta = [with - current] Time lag (t-	factor) <u>=</u>	1.03		0.3
0.333 Risk factor		1.00	RFG=de	elta/(t-factor x risk)=

#### Mitigation Determination Formulas (See Section 62-345.600(3), F.A.C.)

For each impact assessment area:

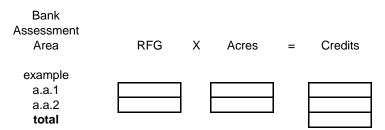
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk)))

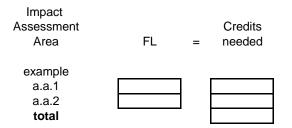
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



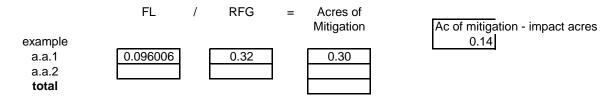
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

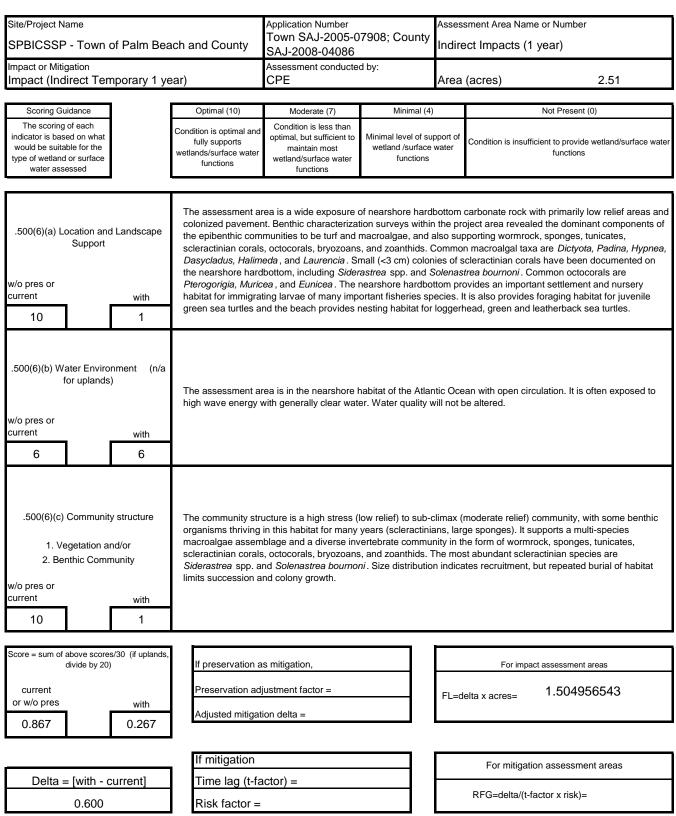


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



Site/Project Na		of Palm Bea	ach and County	Application Number Town SAJ-2005-0 SAJ-2008-04086	7908; County	Mitiga	Assessment Area Name or Number Mitigation for Indirect Temp Impacts (1 yr)		
Impact or Mitig Mitigation	gation			Assessment conducter	d by:	Assess	Assessment date: Oct. 2014		
Scoring Gu The scoring indicator is bas would be suita type of wetland water asso	of each ed on what ble for the or surface		Optimal (10) Condition is optimal and fully supports wetlands/surface water functions	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal ( Minimal level of s wetland /surfac functions	upport of e water	Not Present (0) Condition is insufficient to provide wetland/surface water functions		
.500(6)(a) Lo w/o pres or current 0	ocation and Support	I Landscape with 8	water depth as the		hardbottom res		ated sandy substrate in similar kist in the adjacent area to facilitate		
.500(6)(b) Wa f w/o pres or current 6	ater Enviroi or uplands						an with open circulation. It is often ty will not be not altered.		
1. Ve	Community egetation ar	nd/or	and will create a ref sea turtles since pro	fuge for fish and other r	notile marine org	janisms. I	roalgae and sessile invertebrates t will create a foraging resource fo ow on artificial reefs in the		
	n of above s nds, divide b	•	If preservation a Preservation adj Adjusted mitigat	justment factor =		FL=de	For impact assessment areas		
I If mitig				actor) =	1.03 1.00		or mitigation assessment areas 0.5 lelta/(t-factor x risk)=		

For each impact assessment area:

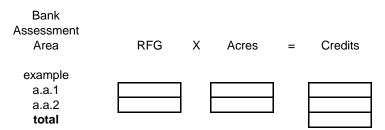
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

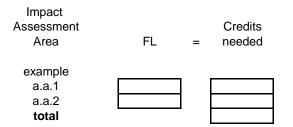
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



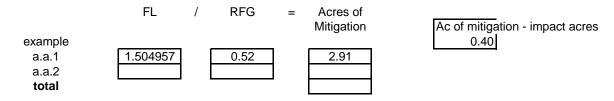
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

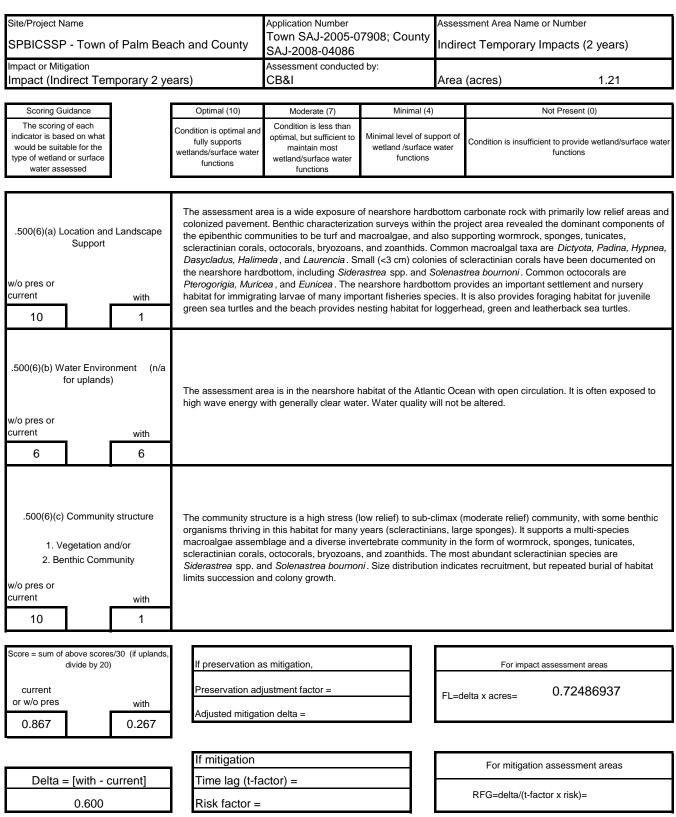


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



		( <b>D</b>   -		Application Number Town SAJ-2005-0	7908; Countv		ment Area Name or Number tion for Indirect Temp			
SPBICSSP	- Town o	of Palm Bea	ach and County	SAJ-2008-04086	, ,	-	ts (2 yr)			
Impact or Mitie Mitigation	Scoring Guidance The scoring of each dicator is based on what would be suitable for the yee of wetland or surface water assessed       Optimal (10) Condition is optimal a fully supports wetlands/surface wa functions         .500(6)(a) Location and Landscape Support       The mitigation a water depth as t recruitment to th         .500(6)(a) Location and Landscape Support       The mitigation a water depth as t recruitment to th         0       6         500(6)(b) Water Environment for uplands)       (n/a for uplands)         .500(6)(c) Community structure       The assessment exposed to high         .500(6)(c) Community structure       An artificial reef and will create a sea turtles since nearshore habits         .500(6)(c) Community structure       An artificial reef and will create a sea turtles since nearshore habits         /o pres or urrent       with         0       6         Score = sum of above scores/30 (if uplands, divide by 20)       If preservation Adjusted mitig         0       0.600		Assessment conducted	d by:	Assessment date: Oct. 2014					
		l								
The scoring indicator is bas would be suita type of wetland	of each ed on what ble for the or surface		Condition is optimal and fully supports wetlands/surface water	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4) Minimal level of su wetland /surface functions	pport of	Not Present (0) Condition is insufficient to provide wetland/surface water functions			
.500(6)(a) Lo w/o pres or current			water depth as the		hardbottom reso		ated sandy substrate in similar ist in the adjacent area to facilitate			
			1							
						-				
current     with       6     6       .500(6)(c) Community structure     An artificial and will created an				fuge for fish and other n	notile marine orga	inisms. I	roalgae and sessile invertebrates t will create a foraging resource fo ow on artificial reefs in the			
Score = sur	n of above s	cores/30 (if	, <u> </u>							
		· ·	If preservation a	s mitigation,			For impact assessment areas			
current or w/o pres		with	Preservation adj	iustment factor =		FL=de	elta x acres=			
0.200		0.600				<u></u>				
			If mitigation			Fo	or mitigation assessment areas			
	E. M.	_	Time la m () fa	at a v)						
Delta =	= [with - c	:urrent]	Time lag (t-fa	actor) =	1.03		elta/(t-factor x risk)=			

For each impact assessment area:

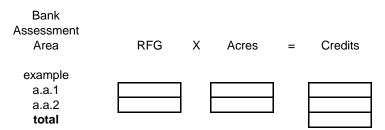
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk)))

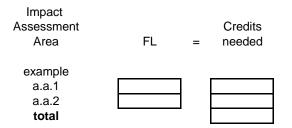
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



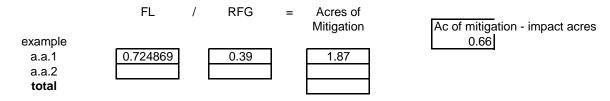
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



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Site/Project N	lama			Application Number		A	mont Aron Nom	o or Numbor	
				Town SAJ-2005-0	7908: County		Assessment Area Name or Number		
SPBICSSF	P - Town o	of Palm Bea	ach and County	SAJ-2008-04086	· · · · , · · · · · · · · · · · · · · ·	Seco	ndary Impacts	6	
Impact or Mit	0			Assessment conducted	d by:				
Impact (se	condary)			CB&I		Area	(acres)	3.20	
Scoring G	uidance		Optimal (10)	Moderate (7)	Minimal (4)			Not Present (0)	
The scoring indicator is bas			Condition is optimal and	Condition is less than optimal, but sufficient to	Minimal level of sur	oport of			
would be suit	able for the		fully supports wetlands/surface water	maintain most	wetland /surface		Condition is insuffi	cient to provide wetland/surface water functions	
type of wetland water ass			functions	wetland/surface water functions	functions				
.500(6)(a) L w/o pres or current 10	ocation and Support	d Landscape with 9	colonized pavemer the epibenthic com scleractinian corals Dasycladus, Halim the nearshore hard Pterogorigia, Muric habitat for immigrat	nt. Benthic characterizat munities to be turf and r s, octocorals, bryozoans eda, and Laurencia. Sr bottom, including Sider ea, and Eunicea. The r	ion surveys within macroalgae, and a , and zoanthids. C mall (<3 cm) colon <i>astrea</i> spp. and S nearshore hardbot ortant fisheries sp	the pro also sup Commor ies of s Colenast tom pro ecies. It	oject area reveale oporting wormroc n macroalgal taxa cleractinian cora trea bournoni. Co ovides an importa t is also provides	a are <i>Dictyota, Padina, Hypnea,</i> Is have been documented on ommon octocorals are ant settlement and nursery foraging habitat for juvenile	
.500(6)(b) W w/o pres or current 6	later Enviro for uplands	•		ea is in the nearshore h vith generally clear wate				sulation. It is often exposed to	
1. V	Communit egetation a nthic Comm	nd/or	organisms thriving macroalgae assem scleractinian corals	in this habitat for many blage and a diverse inv s, octocorals, bryozoans nd <i>Solenastrea bournor</i>	years (scleractinia rertebrate commur a, and zoanthids. T	ans, larg nity in th The mos	ge sponges). It su ne form of wormr st abundant scler	ock, sponges, tunicates,	
Score = sum of	above scores divide by 20)	s/30 (if uplands,	If preservation a	s mitigation			Forimpo	ct assessment areas	
	GIVIUS Dy 20)		•	•			тогшра		
current or w/o pres	1	with	Preservation adj Adjusted mitigati	iustment factor =		FL=de	elta x acres=	0.213128774	
0.867		0.800			_				
			If mitigation				Eor mitigati	on assessment areas	
Delta	= [with - c	current]	Time lag (t-fa	ictor) =				טוי מששבשטווכות מוצמש	
2 0.14	0.067		Risk factor =	·····			RFG=delta/(t-fa	actor x risk)=	
L	0.007		NISK TACIUL						

Site/Project Na	me		Application Number		Assess	ment Area Name or Number
SPBICSSP	- Town of Paln	n Beach and County	Town SAJ-2005-0 SAJ-2008-04086	7908; County	Mitiga	tion for Secondary Impacts
Impact or Mitig Mitigation	ation		Assessment conducter	d by:	Assess Oct. 2	ment date: 2014
Scoring Gui	dance	Optimal (10)	Moderate (7)	Minimal (4	1)	Not Present (0)
The scoring of indicator is base would be suitab type of wetland of water asse	of each d on what le for the or surface	Condition is optimal ar fully supports wetlands/surface wate functions	Condition is less than optimal, but sufficient to	Minimal level of s wetland /surface functions	upport of e water	Condition is insufficient to provide wetland/surface water functions
.500(6)(a) Lo w/o pres or current	cation and Landso Support wit	The mitigation are water depth as th recruitment to the		hardbottom res		ated sandy substrate in similar kist in the adjacent area to facilitate
0	1(	D				
fc w/o pres or current 6	or uplands) wit	exposed to high v	area is in the nearshore h vave energy with general			an with open circulation. It is often ity will not be not altered.
1. Veç	Community structu getation and/or thic Community wit	An artificial reef w and will create a sea turtles since p nearshore habitat	efuge for fish and other r	notile marine org	anisms. I	roalgae and sessile invertebrates t will create a foraging resource fo ow on artificial reefs in the
Score = sum	of above scores/30	(if				
	ds, divide by 20) wit	th Adjusted mitig	djustment factor =		FL=de	For impact assessment areas
		If mitigation			E,	or mitigation assessment areas
Delta =	[with - current	] Time lag (t-	factor) =	1.03		0.5
	0.667	Risk factor		1.25	KFG=0	lelta/(t-factor x risk)=

For each impact assessment area:

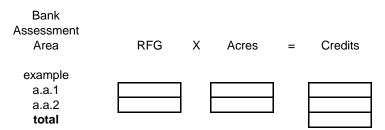
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

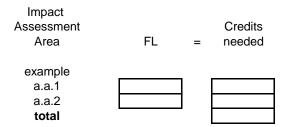
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored



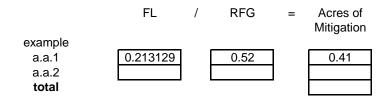
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



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For each impact assessment area:

(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

#### (a) Mitigation Bank Credit Determination

#### (b) Mitigation needed to offset impacts, when using a mitigation bank

#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.

	Impact Types	FL	/	RFG	=	Acres of Mitigation	*Note: for temporary impacts, <i>Mitigation</i> = ( <i>FL/RFG</i> ) - <i>Impact Area</i>
1	Permanent	2.415338		0.52		4.66	]
	Direct Temporary						
2	(< 1 Year)	0.457063		0.58		0.02	
	Direct Temporary						
3	(>1 year)	0.179186		0.45		0.10	
	Direct Temporary						
4	(>2 year)	0.096006		0.32		0.14	
	Indirect Temp. (1						1
5	year)	1.504957		0.52		0.40	
	Indirect Temp. (2						
6	years)	0.724869		0.39		0.66	
	Secondary						1
7	(ETOF)	0.213129		0.52		0.41	
	total					6.39	

Form 62-345.900(3), F.A.C. [effective date]

## SUB-APPENDIX H-2

## DRAFT UMAM ANALYSIS

## TOWN OF PALM BEACH

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

Site/Project Name	Application Number	mbers Assessment Area Name or Number			er			
Southern Palm Beach Islan Comprehensive Shore Stat (Town of Palm Beach portio	oilization Project	SAJ-2005-079	908		Intertidal and Nearshore Subtidal Hardbottom Resources			
FLUCCs code	Further clas	sification (optional)		Impact or M	litigation Site?	Assessment A	rea Size	
571	N/A		Impact \$		Site	2.99	acres (includes 7 impact types, see Part II forms for each)	
Basin/Watershed Name/Number Atlantic Ocean	Affected Waterbody (Cla Class III	ass)	Special C N/A	lassification	(i.e. OFW, AP, other lo	ocal/state/federal d	esignation of importance)	
Geographic relationship to and hydrolo Open waters of the Atlantic Oc north of South Lake Worth Inle	cean. The project a				es south of Lak	ke Worth Inle	et and approximately 2.5 miles	
Assessment area description								
but also supporting wormrock, utitilize this habitat. Species a	less than 15 ft wate, tunicates, sponges	er depth. Survey s, bryozoans and ne ephemeral na	is have s d small co ature of th	hown a be oral coloni ne habitat	enthic communi les. Motile spec which is subjec	ty dominated ies such as t to frequent	d by turf algae and macroalgae, fish, sea turtles and crabs also burial and re-exposure.	
Significant nearby features		Ur	niqueness (c	considering th	ne relative rarity in r	elation to the re	gional landscape.)	
The outer reef (beyond the im nearshore natural hardbottom		Somewhat unique; the intertidal portion of the hardbottom ridge terminates to the north of the project area.						
Functions		Mi	tigation for p	previous perr	mit/other historic us	e		
Provides cover, substrate, refu benthic and motile marine spe	rces for N	/A						
Anticipated Wildlife Utilization Based o are representative of the assessment a						species, their leg	gal classification (E, T, SSC), type of use,	
Benthic characterization surver revealed the dominant compo- communities to be turf and ma- tunicates, octocorals, bryozoa present. Common macroalgal <i>Hypnea, Dasycladus, Halimed</i> cm) colonies of scleractinian co- on the nearshore hardbottom and <i>Solenastrea bournoni</i> . Co- <i>Pterogorigia, Muricea</i> , and <i>Eu</i> fish, sea turtles and crabs also are accustomed to the ephem	thic le ck, sponges, pr were also m P <i>adina,</i> in Small (<3 pr bournented pr strea spp. re are cc cises such as cc t. Species cj	Loggerhead ( <i>Caretta caretta</i> ) (T), Green ( <i>Chelonia mydas</i> ) (E), and leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the project area. The project area is also loggerhead critical habitat (terrestrial and marine). The Florida manatee ( <i>Trichechus manatus latirostris</i> ) (E) is common in Palm Beach County. Smalltooth sawfish ( <i>Pristis pectinata</i> ) (E) has the potential to occur in the project area. Threatened coral species which have the potential to occur in the project area but which have not been observed during recent benthic survyes include: staghorn coral ( <i>Acropora cervicornis</i> ), elkhorn coral ( <i>A. palmata</i> ), boulder star coral ( <i>Orbicella annularis</i> ), mountainous star coral ( <i>O. faveolata</i> ), star coral complex ( <i>O. franski</i> ), pillar coral ( <i>Dendrogyra cylindrus</i> ), and rough cactus coral ( <i>Mycetophyllia ferox</i> ).						
Observed Evidence of Wildlife Utilization	on (List species directly o	bserved, or other sig	ans such as	tracks, dropp	pings, casings, nest	s, etc.):		
Characterization surveys de		-						
	July 2013, inclu ansects immedia ottom to sand rat	ding a mi ately offsh io of 24:7	nimum of hore of the 76 (24% of	2.71 ac in Janu project area of f the area east	uary 2009 ar n the nearsh of the hardb	nd a maximum of 48.78 ac in ore hardbottom adjacent to R- ottom edge is hardbottom and		
Assessment conducted by:		As	sessment d	ate(s):				
CB&I Coastal Planning & Eng	ineering, Inc.	0	ctober 20	)14				

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

Site/Project Name	ber Assessment Area Na			a Name or Numb	er					
Southern Palm Beach Islar	ad									
Comprehensive Shore Stal		Proiect	SAJ-2005-0	07908		Mitigation R	eef			
(Town of Palm Beach portion										
FLUCCs code		Further clas	sification (optiona	al)	Impact or M	litigation Site?	Assessment A	vrea Size		
					impact of m	inigation one.	/ loocoonione /			
571		N/A			Mitigatio	n Site	0.42	acres (mitigation for 7 impact types, see Part II		
					imigatio		0.12	forms for each)		
Basin/Watershed Name/Number	Affected W	aterbody (Cla	ass)	Special C	Special Classification (i.e. OFW, AP, other local/state/federal designation of importanc					
Atlantic Ocean	Class III			N/A						
Geographic relationship to and hydrold	-									
Open waters of the Atlantic On north of South Lake Worth Inle	rea is located	approxima	tely 11 mil	es south of La	ake Worth Inl	et and approximately 2.5 miles				
Assessment area description										
Subtidal limestone boulder art						, ,				
location devoid of hardbottom determine the location of the r			puns similar to	o ine natura	rnearsnon	e narobollom.	. Additional S	urveys will be conducted to		
	C									
Significant nearby features			-			egional landscape.)				
The outer reef is located east			atural			II be placed in to mimic the lo		r depths as the impacted		
hardbottom habitat in 40-70 ft	water de	ptn.		naropollon	n in order i	to mimic the ic	DSI TUNCIION O	i the habitat.		
Functions				Mitigation for previous permit/other historic use						
The artificial reef habitat is inte		•		N/A						
characteristics of adjacent nea typically low relief limestone p										
substrate, refuge and food res										
Anticipated Wildlife Utilization Based o are representative of the assessment a				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, d and intensity of use of the assessment area)						
The artificial reef is intented to	•			Loggerhead (Caretta caretta) (T), Green (Chelonia mydas) (E), and						
appearance, texture, relief and habitat it is meant to replace.	d ecologi	cal functio	n of the	leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the project area. The project area is also loggerhead critical habitat (terrestrial and						
nabilat it is meant to replace.				· · ·				atus latirostris) (E) is common		
				in Palm Be	ach Coun	ty. Smalltooth	sawfish (Pris	stis pectinata) (E) has the		
								d coral species which have the nave not been observed during		
				•				Acropora cervicornis), elkhorn		
								annularis), mountainous star		
						star coral com h cactus coral		nski), pillar coral (Dendrogyra		
				cymiaius),	and rougi		(injectopily)			
Observed Evidence of Wildlife Utilization	on (List spe	cies directly c	bserved, or other	signs such as	tracks, dropp	oings, casings, ne	sts, etc.):			
Characterization surveys docu similar to that of natural hardb		the biota li	sted above fo	or natural ne	earshore ha	ardbottom. Uti	ilization of art	ificial reef is expected to be		
Additional relevant factors:										
Limestone is a natural materia reefs have been documented								ite. Limestone boulder artificial a.		
Assessment conducted by:				Assessment of	late(s):					
CB&I Coastal Planning & Eng	jineering,	Inc.		October 20						

				I.			
Site/Project Name		Application Number		Assessment Area Name or Number			
Southern Palm Beach Island C		SA 1 2005 07009		D			
Shore Stabilization Project (To portion)	wit of Palm Deach	SAJ-2005-07906		Perman	ent Impacts		
Impact or Mitigation		Assessment conducted	d by:				
Impact (Permanent)		CB&I	u by.	Area (ad	cres)	0.02	
				(			
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)			Not Present (0)	
The scoring of each	Condition is optimal and	Condition is less than					
indicator is based on what would be suitable for the	fully supports wetlands/surface water	optimal, but sufficient to maintain most	Minimal level of sup wetland /surface			ficient to provide wetland/surface water functions	
type of wetland or surface water assessed	functions	wetland/surface water functions	functions			water functions	
water assessed		TUTCIONS					
		ea is a wide exposure o ment. Benthic characte				n primarily low relief areas aled the dominant	
.500(6)(a) Location and Landscape			-	-		rting wormrock, sponges,	
Support						algal taxa are Dictyota, cleractinian corals have been	
		nearshore hardbottom,			,		
w/o pres or						les an important settlement	
current with						o provides foraging habitat reen and leatherback sea	
10 1	turtles.		1		- 33, 3		
I							
.500(6)(b) Water Environment (n/a							
for uplands)	The economic of	aa ia ia tha naarahara h	abitat of the Atlan			lation It is often avaged to	
		ea is in the nearshore h vith generally clear wate			•	lation. It is often exposed to	
w/o pres or	3	<b>J</b>	1				
current with							
6 6	Ï						
.500(6)(c) Community structure						mmunity, with some benthic	
	• •	in this habitat for many y blage and a diverse inve					
<ol> <li>Vegetation and/or</li> <li>Benthic Community</li> </ol>	•	, octocorals, bryozoans,					
2. Donano Community	Siderastrea spp. an limits succession an		ni. Size distribution	n indicates	recruitment, bu	ut repeated burial of habitat	
w/o pres or	infines succession an	id colony growin.					
current with	4						
10 1							
	,						
Score = sum of above scores/30 (if uplands, divide by 20)	If preservation a	s mitigation.			For impact	assessment areas	
aplanad, alvido by 20j					. or impdot		
current	Preservation adj	ustment factor =		FL=delta	x acres=	0.014125201	
or w/o pres with	Adjusted mitigat	ion delta =					
0.867 0.267							
	_						
	If mitigation				For mitigation	assessment areas	
Delta = [with - current]	Time lag (t-fa	actor) =					
0.600	Risk factor =			R	FG=delta/(t-fac	ctor x risk)=	
0.000				<u> </u>			

Site/Project Name		Application Number		Assess	sment Area Name or Number	
Southern Palm Beach Island C Shore Stabilization Project (Tov		SAJ-2005-07908		Mitian	ation for Dormonant Imposto	
Beach portion)	whoi Paim	SAJ-2005-07908		wiitiga	ation for Permanent Impacts	
Impact or Mitigation		Assessment conducted	l by:	Assessment date:		
Mitigation		CB&I	. ~ ) :	Oct. 2		
Scoring Guidance	Optimal (10)	Moderate (7)	Minima	l (4)	Not Present (0)	
The scoring of each indicator is based on what	Condition is optimal and	Condition is less than optimal, but sufficient to	Minimal le			
would be suitable for the	fully supports wetlands/surface water	maintain most	support of v /surface		Condition is insufficient to provide wetland/surface water functions	
type of wetland or surface water assessed	functions	wetland/surface water functions	functio	ons		
.500(6)(a) Location and Landscape Support						
Capport	-				onsolidated sandy substrate in resources exist in the adjacent	
		cruitment to the propose			-	
w/o pres or current with						
With						
0 10						
.500(6)(b) Water Environment (n/a						
for uplands)	The assessment ar	ea is in the nearshore h	abitat of the	e Atlanti	c Ocean with open circulation. It is	
	often exposed to high	gh wave energy with ge	nerally clea	r water.	Water quality will not be not altered.	
w/o pres or						
current with						
6 6						
.500(6)(c) Community structure	An artificial roof will	provido substrato for br	onthic room	itmont	of macroalgae and sessile	
1. Vegetation and/or					marine organisms. It will create a	
2. Benthic Community					nave been documented to grow on	
	artificial reefs in the	nearshore habitat of So	outheast Flo	orida.		
w/o pres or						
current with						
0 10						
Score = sum of above scores/30 (if uplands, divide by 20)	If preservation a	s mitigation			For impact assessment areas	
upianus, uiviue by 20)		5 muyau01,			For impact assessment areas	
current	Preservation adj	ustment factor =		FI =di	elta x acres=	
or w/o pres with	Adjusted mitigat	ion delta –		=-0		
0.200 0.867	Aujusteu mitigat					
	8					
	If mitigation			F	or mitigation assessment areas	
	1				-	
Delta = [with - current]	Time lag (t-fa	actor) =	1.03	RFG-	0.52 delta/(t-factor x risk)=	
0.667	Risk factor =					

For each impact assessment area:

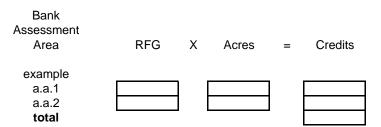
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

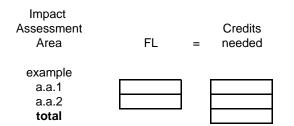
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



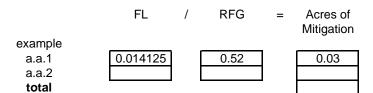
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

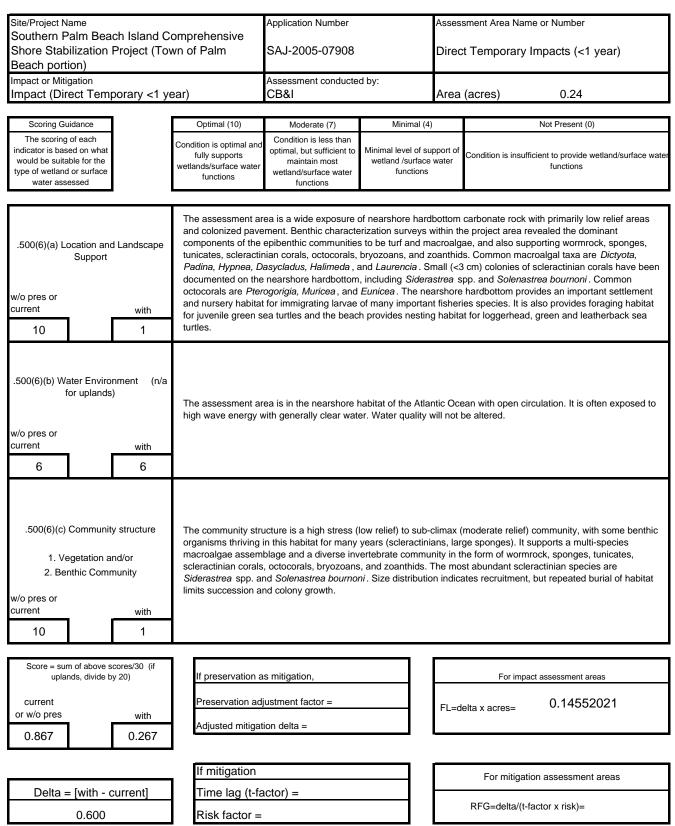


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



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Site/Project N	ame			Application Number		Assessment Area Name or Number		
Southern F	Palm Bea		Comprehensive				ation for Direct Temp	
		Project (To	wn of Palm	SAJ-2005-07908		-	cts (<1 yr)	
Beach port Impact or Miti				Assessment conducte	d by:		sment date:	
Mitigation				CB&I	,	Oct. 2		
Scoring Gu	lidance		Optimal (10)	Moderate (7)	Minimal (4	)	Not Present (0)	
The scoring	of each		Condition is optimal and	Condition is less than				
indicator is bas would be suita	able for the		fully supports wetlands/surface water	optimal, but sufficient to maintain most	Minimal level of su wetland /surface		Condition is insufficient to provide wetland/surface water functions	
type of wetland water ass			functions	wetland/surface water functions	functions			
r			1					
.500(6)(a) L		d Landscape						
	Support		-				dated sandy substrate in similar xist in the adjacent area to facilitate	
				proposed mitigative artif			אושניות נווב מטומטבווג מופמ נט ומטווונמופ	
w/o pres or current		with						
0	1	9	1					
.500(6)(b) Wa	ater Enviro for uplands							
		,					an with open circulation. It is often	
w/o pres or			exposed to high wa	ave energy with general	iy clear water. wa	ater qua	lity will not be not altered.	
current	-	with						
6		6						
.500(6)(c)	Communit	y structure						
4.34							croalgae and sessile invertebrates It will create a foraging resource for	
	egetation a nthic Comr		sea turtles since pr	eferred macroalgae hav	•		row on artificial reefs in the	
			nearshore habitat c	of Southeast Florida.				
w/o pres or current		with						
0	1	9	1					
	n of above s nds, divide b	cores/30 (if ov 20)	If preservation a	as mitigation			For impact assessment areas	
		., _0,		,				
current or w/o pres		with	Preservation ad	justment factor =		FL=de	elta x acres=	
0.200	1	0.800	Adjusted mitigat	tion delta =				
0.200		0.000	J					
			If mitigation			F	or mitigation assessment areas	
Delta =	= [with - o	currentl	Time lag (t-fa	actor) =	1.03	<u> </u>	0.58	
20114	0.600		Risk factor =	,	1.00	RFG=0	delta/(t-factor x risk)=	
	0.000		RISK TACLOF =		1.00	L		

For each impact assessment area:

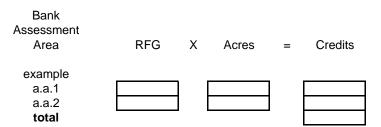
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

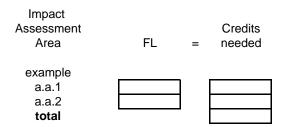
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



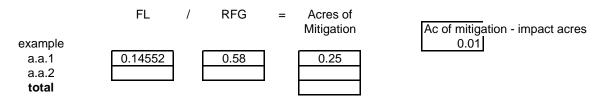
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

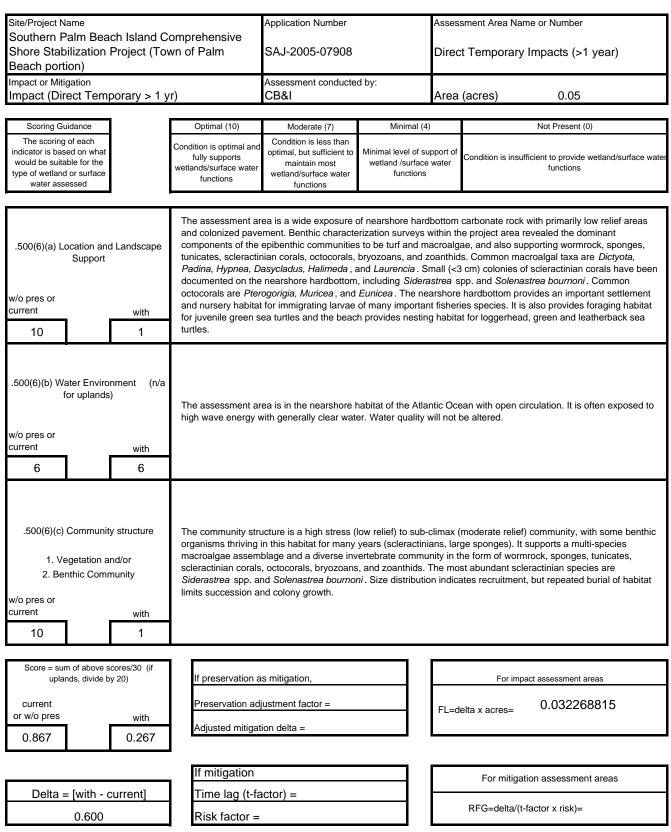


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.







Site/Project N				Application Number		A	ment Area Name or Number	
Southern F	alm Bea ilization	ch Island C Project (To	omprehensive wn of Palm	Application Number SAJ-2005-07908		Mitiga	Mitigation for Direct Temp Impacts (>1 yr)	
Impact or Mitig				Assessment conducted	d by:	Assess Oct. 2	ment date: 2014	
Scoring Gu			Optimal (10)	Moderate (7)	Minimal (4	)	Not Present (0)	
The scoring indicator is bas would be suita type of wetland water ass	ed on what ble for the f or surface		Condition is optimal and fully supports wetlands/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of su wetland /surface functions		Condition is insufficient to provide wetland/surface water functions	
.500(6)(a) L w/o pres or current 0	ocation and Support	d Landscape with 7	water depth as the		hardbottom reso		ated sandy substrate in similar ist in the adjacent area to facilitate	
.500(6)(b) Water Environment (n/a for uplands)							n with open circulation. It is often ty will not be not altered.	
6     6       .500(6)(c) Community structure     An artificial reef w and will create a r sea turtles since p				I provide substrate for benthic recruitment of macroalgae and sessile invertebrates fuge for fish and other motile marine organisms. It will create a foraging resource for eferred macroalgae have been documented to grow on artificial reefs in the of Southeast Florida.				
Sooro - cur	n of above e	ooroo/20 (if				<b></b>		
	n of above s nds, divide b	cores/30 (if y 20)	If preservation a	s mitigation,			For impact assessment areas	
		- ,		U /			•	
current or w/o pres	I	with	Preservation adj Adjusted mitigati			FL=de	elta x acres=	
0.200		0.667						
			If mitigation			Fo	or mitigation assessment areas	
Delta =	= [with - c	current]	Time lag (t-fa	actor) =	1.03		0.45 lelta/(t-factor x risk)=	
	0.467		Risk factor =		1.00		· /	

For each impact assessment area:

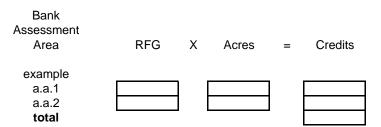
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

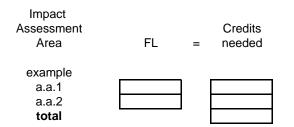
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



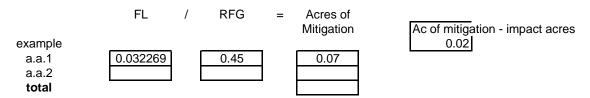
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

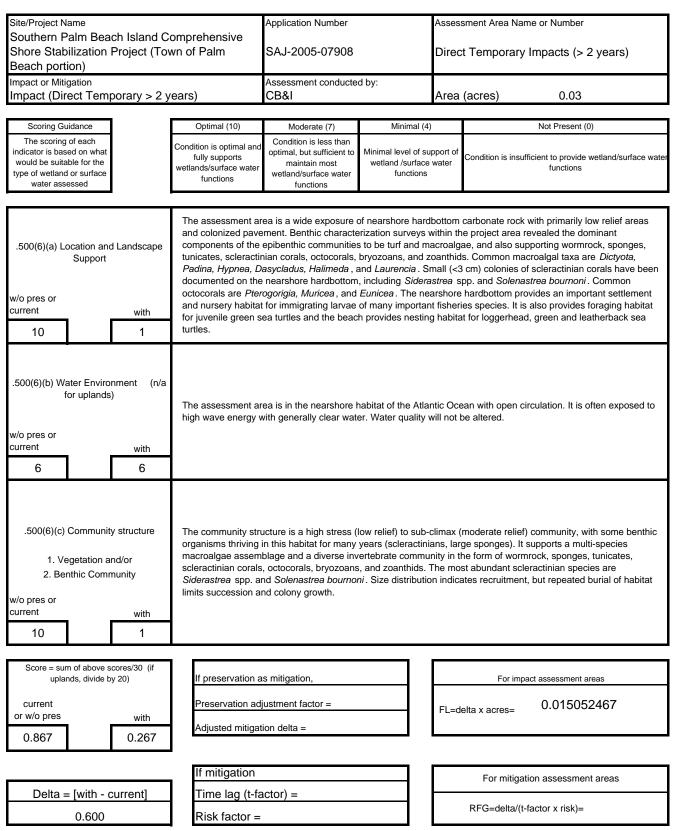


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]



Site/Project Name		Application Number		Assessment Area Name or Number		
Southern Palm Beach Island Shore Stabilization Project (T portion)				Mitigation for Direct Temp Impacts (>2 yr)		
Impact or Mitigation Mitigation		Assessment conducted	d by:	Assessn Oct. 20	nent date: 014	
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4	)	Not Present (0)	
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetlands/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of su wetland /surface functions		Condition is insufficient to provide wetland/surface water functions	
.500(6)(a) Location and Landscape Support w/o pres or current with 0 5	The mitigation area water depth as the		hardbottom reso		ted sandy substrate in similar st in the adjacent area to facilitate	
.500(6)(b) Water Environment (n. for uplands) w/o pres or current with 6 6	The assessment ar	rea is in the nearshore h ave energy with generall			n with open circulation. It is often y will not be not altered.	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 0 5	and will create a re sea turtles since pr	fuge for fish and other n	notile marine orga	nisms. It	balgae and sessile invertebrates will create a foraging resource for w on artificial reefs in the	
Score = sum of above scores/30 (if uplands, divide by 20)         current or w/o pres       with         0.200       0.533	If preservation a Preservation ad Adjusted mitigat	justment factor =		FL=del	For impact assessment areas ta x acres=	
Delta = [with - current] 0.333	If mitigation Time lag (t-fa Risk factor =		1.03 1.00		r mitigation assessment areas 0.32 elta/(t-factor x risk)=	

For each impact assessment area:

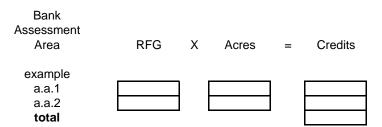
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

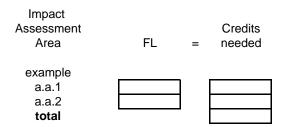
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



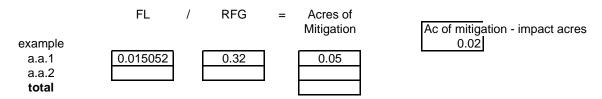
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.





Site/Project Name		Application Number		Assessment Area Name or Number				
Southern Palm Beach Island C Shore Stabilization Project (To		SAJ-2005-07908		Indirect Impacts (1 year)				
Beach portion)	WITOFFailt	SAJ-2003-07300		indirect impacts (1 year)				
Impact or Mitigation		Assessment conducted	d by:					
Impact (Indirect Temporary 1 y	ear)	CPE	a by:	Area	(acres) 0.05			
		-						
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)		Not Present (0)			
The scoring of each	Condition is optimal and	Condition is less than						
indicator is based on what would be suitable for the	fully supports	optimal, but sufficient to maintain most	Minimal level of sup wetland /surface v		Condition is insufficient to provide wetland/surface v	vater		
type of wetland or surface	wetlands/surface water functions	wetland/surface water	functions	indito.	functions			
water assessed	Tanotionio	functions						
						_		
		The assessment area is a wide exposure of nearshore hardbottom carbonate rock with primarily low relief areas						
E00(E)(a) Lagation and Landscope	and colonized pavement. Benthic characterization surveys within the project area revealed the dominant components of the epibenthic communities to be turf and macroalgae, and also supporting wormrock, sponges,							
.500(6)(a) Location and Landscape Support		tunicates, scleractinian corals, octocorals, bryozoans, and zoanthids. Common macroalgal taxa are <i>Dictyota,</i>						
					3 cm) colonies of scleractinian corals have bee	en		
			-		pp. and Solenastrea bournoni. Common hardbottom provides an important settlement	,		
w/o pres or current with					ies species. It is also provides foraging habita			
		ea turtles and the beac	h provides nesting	g habita	at for loggerhead, green and leatherback sea			
10 1	turtles.							
.500(6)(b) Water Environment (n/a								
for uplands)	The assessment ar	ea is in the nearshore h	abitat of the Atlan	ntic Oce	ean with open circulation. It is often exposed to	0		
		with generally clear wate				_		
w/o pres or								
current with								
6 6								
.500(6)(c) Community structure	The community structure is a high stress (low relief) to sub-climax (moderate relief) community, with some benthic organisms thriving in this habitat for many years (scleractinians, large sponges). It supports a multi-species macroalgae assemblage and a diverse invertebrate community in the form of wormrock, sponges, tunicates,							
1. Vegetation and/or	-	-		-	st abundant scleractinian species are			
2. Benthic Community			ni. Size distribution	n indica	ates recruitment, but repeated burial of habita	t		
w/o pres or	limits succession a	nd colony growth.						
current with								
10 1								
Score = sum of above scores/30 (if	]							
uplands, divide by 20)	If preservation a	is mitigation,			For impact assessment areas			
current	Preservation ad	justment factor =			elta v acres- 0.032233286			
or w/o pres with	1 reservation au			FL=de	elta x acres= 0.032233200			
0.867 0.267	Adjusted mitigat	ion delta =						
0.007 0.207	J							
	If mitication							
	If mitigation				For mitigation assessment areas			
Delta = [with - current]	Time lag (t-fa	actor) =						
0.600	Risk factor =				RFG=delta/(t-factor x risk)=			

Sito/Drainet N				Application Number		A	mont Aroo Nomo or Niverbor		
Site/Project N		ob Joland C	omprohonoisco	Application Number			Assessment Area Name or Number		
			omprehensive	SA 1 2005 07000		Mitiga	ation for Indirect Temp		
	ilization	Project (10	wh of Paim Beach	SAJ-2005-07908		-	cts (1 yr)		
portion)									
Impact or Mitig	gation			Assessment conducted	d by:		sment date:		
Mitigation				CB&I		Oct. 2014			
		-							
Scoring Gu			Optimal (10)	Moderate (7)	Minimal (4)	)	Not Present (0)		
The scoring indicator is bas			Condition is optimal and	Condition is less than optimal, but sufficient to	Minimal Investor for any out				
would be suita			fully supports	maintain most	Minimal level of su wetland /surface	face water			
type of wetland			wetlands/surface water surface water functions wetland/surface water				wetland/surface water functions		
water ass	essed		functions	functions					
			_						
.500(6)(a) Lo	ocation and	d Landscape							
	Support		The mitigation grap is shallow water people is helder of water a fidetail and the description of the fide						
			-	The mitigation area is shallow water nearshore habitat of unconsolidated sandy substrate in similar water depth as the impact area. Nearshore hardbottom resources exist in the adjacent area to facilitate					
			water depth as the impact area. Nearshore hardbottom resources exist in the adjacent area to facilitate recruitment to the proposed mitigative artificial reef.						
w/o pres or				residiation to the proposed margarete attinual rest.					
current	-	with	J						
0		8							
0		0							
.500(6)(b) Wa	ater Enviro	nment (n/a							
	for uplands								
			The assessment area is in the nearshore habitat of the Atlantic Ocean with open circulation. It is often exposed to high wave energy with generally clear water. Water quality will not be not altered.						
			exposed to high wa	ive energy with general	y clear water. Wa	ter qual	ity will not be not altered.		
w/o pres or									
current		with							
6		6							
_									
			An artificial reef will provide substrate for benthic recruitment of macroalgae and sessile invertebrates and will create a refuge for fish and other motile marine organisms. It will create a foraging resource for						
.500(6)(c)	Communit	y structure							
	egetation a						ow on artificial reefs in the		
2. Bei	nthic Comr	nunity		of Southeast Florida.		.cu to gi			
w/o pres or current									
Guirent		with	4						
0		8							
Score - sur	n of above s	cores/30 (if	1			<b></b>			
	nds, divide b		If preservation a	s mitigation,			For impact assessment areas		
	-						·		
current			Preservation adj	ustment factor =			elta x acres=		
or w/o pres	_	with					ciia x duies=		
0.200		0.733	Adjusted mitigat	ion delta =		L			
0.200 0.755									
			If mitigation			F	or mitigation assessment areas		
			1				-		
Delta = [with - current]			Time lag (t-fa	actor) =	1.03	0.50	0.52		
	0 533		Risk factor =		1.00	KFG=0	delta/(t-factor x risk)=		
0.533			RISK IACIUI =		1.00	L			

For each impact assessment area:

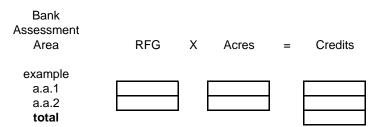
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

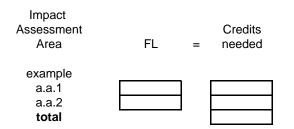
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



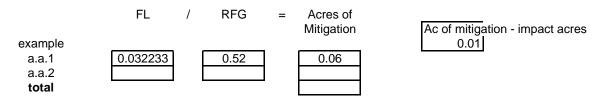
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

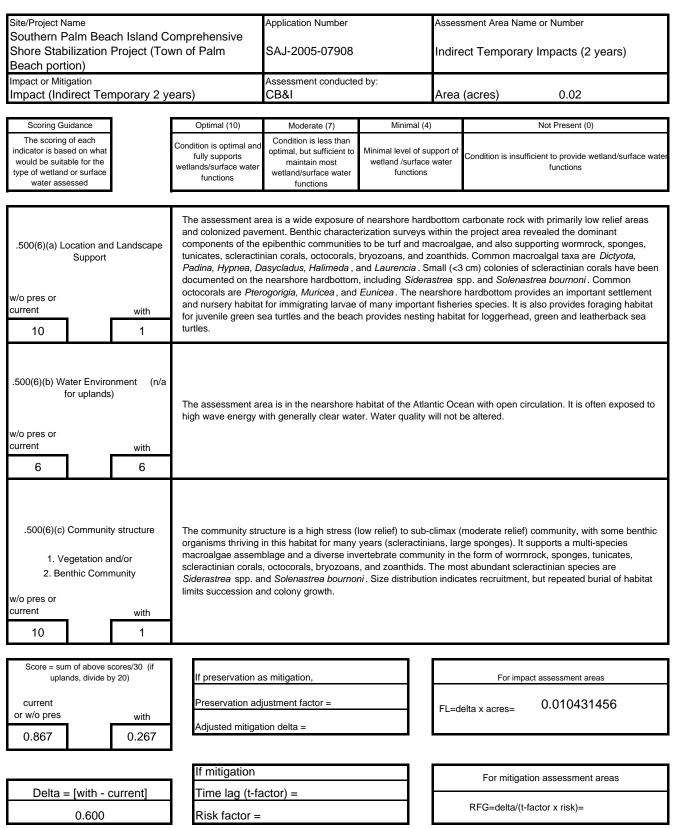


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.







Site/Project Name				Application Number			Assessment Area Name or Number	
Southern Palm Beach Island Comprehensive Shore Stabilization Project (Town of Palm Beach portion)				SAJ-2005-07908		-	ation for Indirect Temp cts (2 yr)	
Impact or Mitiga Mitigation	ation			,			sment date: 2014	
Scoring Guid The scoring of			Optimal (10)	Moderate (7) Condition is less than	Minimal (	4)	Not Present (0)	
indicator is based would be suitable type of wetland o water asses	d on what le for the or surface		Condition is optimal and fully supports wetlands/surface water functions	optimal, but sufficient to Minimal level of support of maintain most wetland/surface water functions			Condition is insufficient to provide wetland/surface water functions	
.500(6)(a) Loc s w/o pres or current 0	cation and Support	Landscape with	The mitigation area is shallow water nearshore habitat of unconsolidated sandy substrate in similar water depth as the impact area. Nearshore hardbottom resources exist in the adjacent area to facilitate recruitment to the proposed mitigative artificial reef.					
.500(6)(b) Wate for w/o pres or current 6	er Enviror r uplands)		The assessment area is in the nearshore habitat of the Atlantic Ocean with open circulation. It is often exposed to high wave energy with generally clear water. Water quality will not be not altered.					
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 0 6			and will create a ref	n artificial reef will provide substrate for benthic recruitment of macroalgae and sessile invertebrates nd will create a refuge for fish and other motile marine organisms. It will create a foraging resource for turtles since preferred macroalgae have been documented to grow on artificial reefs in the earshore habitat of Southeast Florida.				
Score = sum o	of above s	cores/30 (if	ı r			<b></b>		
	ls, divide b	•	If preservation a	s mitigation,			For impact assessment areas	
current or w/o pres with		Preservation adjustment factor = FL=delta x acres=				elta x acres=		
0.200		0.600	Adjusted mitigat	ion delta =				
			J					
			If mitigation			For mitigation assessment areas		
Delta = [with - current]			Time lag (t-fa	lag (t-factor) = 1.03 RFG=delta/(t-factor x risk)=				
0.400			Risk factor =		1.00		שפונמי (נ־ומטוטו א וואגן=	

For each impact assessment area:

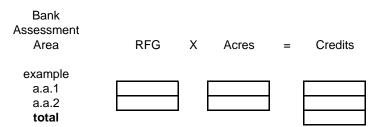
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

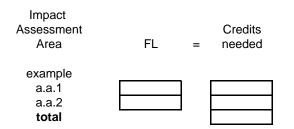
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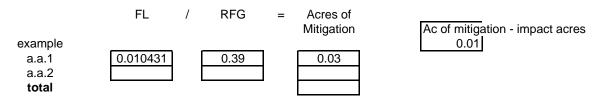
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

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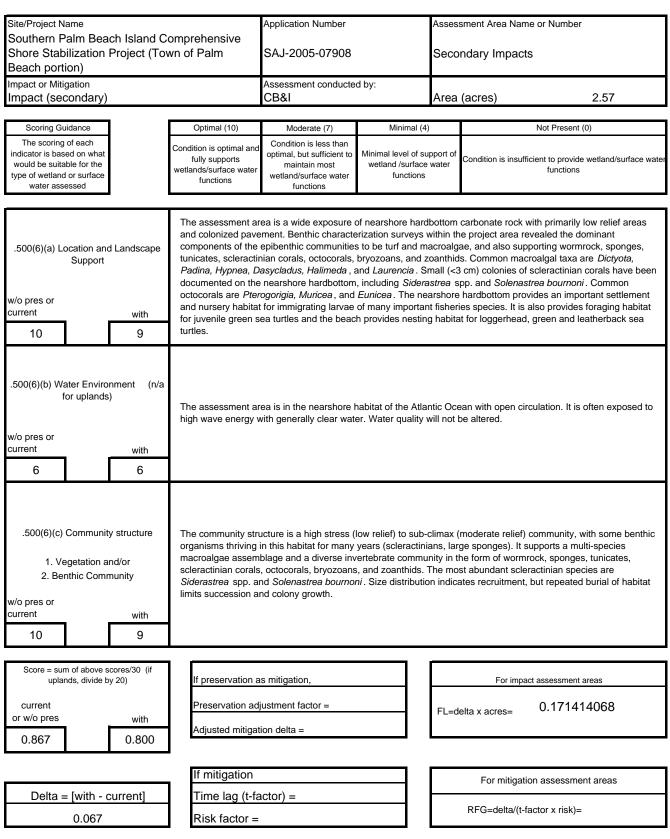


#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.







Site/Project Name			Application Number		Accord	ement Area Name or Number		
Southern Palm Beau	ch Island C	Application Number			Assessment Area Name or Number			
Shore Stabilization		SA.1-2005-07908		Mitigation for Secondary Impacts				
portion)	10,000 (10)		acii 3A3-2003-07 908					
Impact or Mitigation			Assessment conducted	d by:	Assess	sment date:		
Mitigation			CB&I	-	Oct. 2	2014		
Scoring Guidance		Optimal (10)	Moderate (7)	Minimal (	4)	Not Present (0)		
The scoring of each indicator is based on what		Condition is optimal and	Condition is less than optimal, but sufficient to	Minimal level of s	upport of	Condition is insufficient to another		
would be suitable for the		fully supports wetlands/surface water	maintain most	wetland /surfac functions		Condition is insufficient to provide wetland/surface water functions		
type of wetland or surface water assessed		functions	wetland/surface water functions	S				
.500(6)(a) Location and Support	Landscape							
Support		The mitigation area is shallow water nearshore habitat of unconsolidated sandy substrate in similar water depth as the impact area. Nearshore hardbottom resources exist in the adjacent area to facilitate						
			impact area. Nearshore		Juices ex	NSULT THE AUJACETT ATEA TO TACHITATE		
w/o pres or								
current	with							
0	10							
.500(6)(b) Water Enviror								
for uplands)	)	The assessment ar	ea is in the nearshore h	abitat of the Atla	ntic Ocea	an with open circulation. It is often		
						ity will not be not altered.		
w/o pres or								
current	with	J						
6	6							
.500(6)(c) Community	/ structure							
			•			roalgae and sessile invertebrates It will create a foraging resource for		
1. Vegetation ar 2. Benthic Comm						row on artificial reefs in the		
2. Benunic Comm	iuriity		f Southeast Florida.		-			
w/o pres or								
current	with	1						
0	10							
		•						
Score = sum of above so		1						
uplands, divide by	y 20)	If preservation a	s mitigation,			For impact assessment areas		
current		Preservation adi	ustment factor =					
or w/o pres	with	Preservation adjustment factor = FL=delta x acres=						
0.200	0.867	Adjusted mitigat	ion delta =					
0.200	0.007	J						
		If mitigation						
		ii iiiugauon			F	or mitigation assessment areas		
Delta = [with - c	urrent]	Time lag (t-fa	actor) =	1.03		0.52		
0.667		Risk factor =		1.25	RFG=0	delta/(t-factor x risk)=		
0.001					1			

For each impact assessment area:

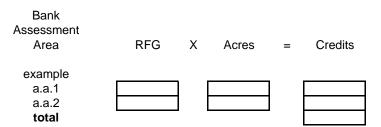
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

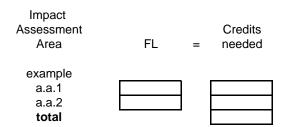
#### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scorec



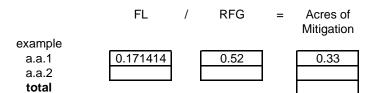
#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regiona offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.



Form 62-345.900(3), F.A.C. [effective date]

For each impact assessment area:

(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

#### (a) Mitigation Bank Credit Determination

#### (b) Mitigation needed to offset impacts, when using a mitigation bank

#### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.

Impact Types		FL	/	RFG	=	Acres of Mitigation	*Note: for temporary impacts, <i>Mitigation</i> = ( <i>FL/RFG</i> ) - <i>Impact Area</i>
1	Permanent Direct Temporary	0.014125		0.52	]	0.03	
2	(< 1 Year) Direct Temporary	0.14552		0.58		0.01	
3	(>1 year) Direct Temporary	0.032269		0.45		0.02	
4	(>2 year) Indirect Temp. (1	0.015052		0.32		0.02	
5	year) Indirect Temp. (2	0.032233		0.52		0.01	
6	years) Secondary	0.010431		0.39		0.01	
7	(ETOF)	0.171414		0.52		0.33	
	total					0.42	]

Form 62-345.900(3), F.A.C. [effective date]

## SUB-APPENDIX H-3

## DRAFT UMAM ANALYSIS

## PALM BEACH COUNTY

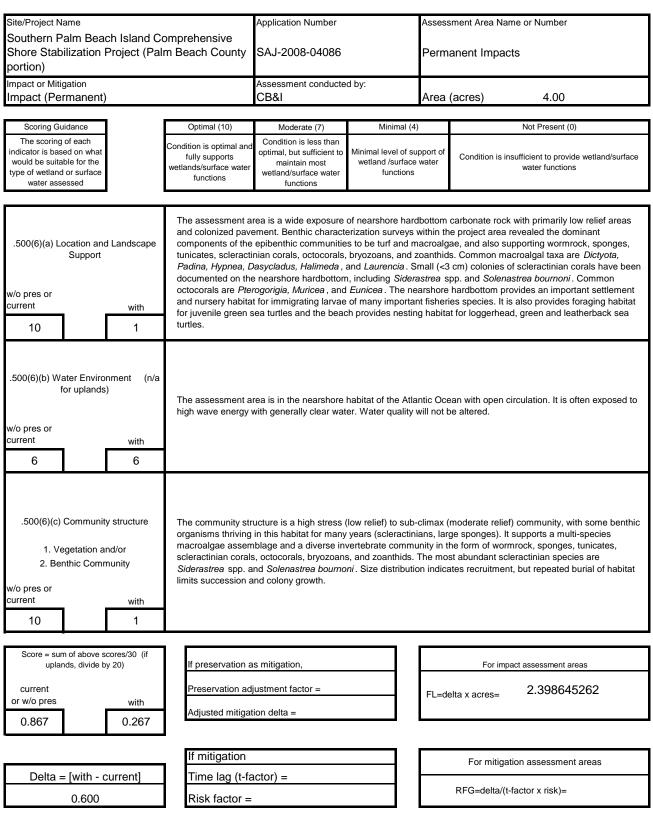
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### PART I – Qualitative Description (See Section 62-345.400, F.A.C.)

			mbers Assessment Area Name or Number			ei			
Southern Palm Beach Island Comprehensive Shore Stab (Palm Beach County portion	ilization Project	SAJ-2008-04	SAJ-2008-04086			Intertidal and Nearshore Subtidal Hardbottom Resources			
FLUCCs code	Further clas	ssification (optional)		Impact or M	itigation Site?	Assessment A	irea Size		
571	N/A			Impact Site 7.14 acres (includes 7 types, see Part II f					
	Affected Waterbody (C Class III	lass)	Special C N/A	Special Classification (i.e. OFW, AP, other local/state/federal designation of importance) N/A					
Geographic relationship to and hydrologi Open waters of the Atlantic Oc north of South Lake Worth Inle	ean. The project a				les south of Lak	ke Worth Inl	let and approximately 2.5 miles		
Assessment area description The hardbottom environment a hardbottom habitat, located in l macroalgae, but also supportin and crabs also utitilize this hab exposure.	less than 15 ft wa g wormrock, tunic	ter depth. Surve cates, sponges,	eys have s bryozoans	hown a be s and sma	enthic communi Il coral colonies	ity dominate s. Motile spe	ed by turf algae and ecies such as fish, sea turtles		
Significant nearby features		U	niqueness (c	onsidering th	e relative rarity in re	elation to the reg	gional landscape.)		
The outer reef (beyond the imp the nearshore natural hardbotto depth.			Somewhat unique; the intertidal portion of the hardbottom ridge terminates to the north of the project area.						
Functions		М	litigation for p	revious pern	nit/other historic use	ł			
Provides cover, substrate, refu benthic and motile marine spec		urces for N	I/A						
Anticipated Wildlife Utilization Based on are representative of the assessment are found)					sted Species (List s assessment area)	pecies, their lec	gal classification (E, T, SSC), type of use,		
Benthic characterization survey revealed the dominant compon communities to be turf and mar- tunicates, octocorals, bryozoan present. Common macroalgal t <i>Hypnea, Dasycladus, Halimeda</i> cm) colonies of scleractinian co on the nearshore hardbottom a and <i>Solenastrea bournoni</i> . Con <i>Pterogorigia, Muricea</i> , and <i>Eu</i> fish, sea turtles and crabs also are accustomed to the epheme	nthic le pock, sponges, p were also m , P <i>adina,</i> ir . Small (<3 p locumented p astrea spp. re are c cies such as c at. Species c	Loggerhead ( <i>Caretta caretta</i> ) (T), Green ( <i>Chelonia mydas</i> ) (E), and leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the project area. The project area is also loggerhead critical habitat (terrestrial and marine). The Florida manatee ( <i>Trichechus manatus latirostris</i> ) (E) is common in Palm Beach County. Smalltooth sawfish ( <i>Pristis pectinata</i> ) (E) has the potential to occur in the project area. Threatened coral species which have the potential to occur in the project area but which have not been observed during recent benthic survyes include: staghorn coral ( <i>Acropora cervicornis</i> ), elkhorn coral ( <i>A. palmata</i> ), boulder star coral ( <i>Orbicella annularis</i> ), mountainous star coral ( <i>O. faveolata</i> ), star coral complex ( <i>O. franski</i> ), pillar coral ( <i>Dendrogyra cylindrus</i> ), and rough cactus coral ( <i>Mycetophyllia ferox</i> ).							
Observed Evidence of Wildlife Utilization				racks, dropp	ings, casings, nests	, etc.):			
Characterization surveys do	cumented the b	iota listed abov	ve.						
Additional relevant factors: The hardbottom in highly ephen between R-127 and R-141 from January 2006. Line intercept da 130 to R-141 revealed this area 76% is sand) (CBI, 2014). HB o	July 2013, inclu ansects immedi ottom to sand ra	uding a mi ately offsh atio of 24:7	nimum of hore of the '6 (24% of	2.71 ac in Janu e project area of f the area east	uary 2009 a n the nearsl of the hardb	nd a maximum of 48.78 ac in hore hardbottom adjacent to R- pottom edge is hardbottom and			
Assessment conducted by:		A	ssessment d	ate(s):					
CB&I Coastal Planning & Engir	neering, Inc.	C	October 2014						

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

Site/Project Name		Application Number	ation Number			Assessment Area Name or Number			
Southern Palm Beach Island									
Comprehensive Shore Stabilization (Palm Beach County portion)	n Project	SAJ-2008-04	4086		Mitigation Reef				
FLUCCs code	Further class	sification (optional)		Impact or M	litigation Site?	Assessment A	Area Size		
571	N/A			Mitigation	n Site	5.44	acres (mitigation for 7 impact types, see Part II forms for each)		
Basin/Watershed Name/Number Affected W Atlantic Ocean Class III	aterbody (Cla	ass)	Special C N/A	Classification	(i.e. OFW, AP, other	local/state/federal	designation of importance)		
Geographic relationship to and hydrologic connecti	ion with wetla	nds, other surface v	water, upland	s					
Open waters of the Atlantic Ocean. The north of South Lake Worth Inlet.	e project a	rea is located a	approxima	itely 11 mi	les south of La	ake Worth In	let and approximately 2.5 miles		
Assessment area description									
Subtidal limestone boulder artificial ree location devoid of hardbottom habitat in determine the location of the mitigative	n water de								
Significant nearby features		l	Jniqueness (d	considering th	e relative rarity in	relation to the re	gional landscape.)		
The outer reef is located east of the ne hardbottom habitat in 40-70 ft water de		The artificial reefs will be placed in similar water depths as the impacted hardbottom in order to mimic the lost function of the habitat.							
Functions				previous pern	nit/other historic us	e			
The artificial reef habitat is intended to characteristics of adjacent nearshore h typically low relief limestone pavement. substrate, refuge and food resources for	ich is vide cover,	N/A							
Anticipated Wildlife Utilization Based on Literature are representative of the assessment area and rea found)					sted Species (List assessment area)	species, their leo	gal classification (E, T, SSC), type of use,		
The artificial reef is intented to replicate appearance, texture, relief and ecologic habitat it is meant to replace.	n of the F r ii F r c c c c c c c c	Loggerhead ( <i>Caretta caretta</i> ) (T), Green ( <i>Chelonia mydas</i> ) (E), and leatherback ( <i>Dermochelys coriacea</i> ) (E) sea turtles regularly nest in the project area. The project area is also loggerhead critical habitat (terrestrial and marine). The Florida manatee ( <i>Trichechus manatus latirostris</i> ) (E) is common in Palm Beach County. Smalltooth sawfish ( <i>Pristis pectinata</i> ) (E) has the potential to occur in the project area. Threatened coral species which have the potential to occur in the project area but which have not been observed during recent benthic survyes include: staghorn coral ( <i>Acropora cervicornis</i> ), elkhorn coral ( <i>A. palmata</i> ), boulder star coral ( <i>Orbicella annularis</i> ), mountainous star coral ( <i>O. faveolata</i> ), star coral complex ( <i>O. franski</i> ), pillar coral ( <i>Dendrogyra cylindrus</i> ), and rough cactus coral ( <i>Mycetophyllia ferox</i> ).							
Observed Evidence of Wildlife Utilization (List spec	cies directly o	bserved, or other si	igns such as	tracks, dropp	ings, casings, nest	s, etc.):			
Characterization surveys documented similar to that of natural hardbottom.	the biota li	sted above for	natural ne	earshore h	ardbottom. Uti	lization of ar	tificial reef is expected to be		
Additional relevant factors: Limestone is a natural material and will reefs have been documented to offset									
Assessment conducted by:			ssessment c						
CB&I Coastal Planning & Engineering,	Inc.		October 20	)14					
Form 62-345.900(1), F.A.C. [effective date]									



Site/Project Name		Application Number		Assessment Area Name or Number		
Southern Palm Beach Island C Shore Stabilization Project (Pa		SAJ-2008-04086		Mitia	ation for Permanent Impacts	
portion)	in beach county	373-2000-04000		wiitiga	alion for Fernianeni impacis	
Impact or Mitigation		Assessment conducted	l by:	Assessment date:		
Mitigation		CB&I		Oct. 2014		
				1 / 4 \		
Scoring Guidance The scoring of each	Optimal (10)	Moderate (7) Condition is less than	Minima Minimal le		Not Present (0)	
indicator is based on what would be suitable for the	Condition is optimal and fully supports	optimal, but sufficient to maintain most	support of		Condition is insufficient to provide	
type of wetland or surface	wetlands/surface water functions	wetland/surface water	/surface functio		wetland/surface water functions	
water assessed		functions				
.500(6)(a) Location and Landscape Support w/o pres or	similar water depth		arshore har	dbotton	onsolidated sandy substrate in n resources exist in the adjacent al reef.	
current with	1					
0 10						
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 6 6					c Ocean with open circulation. It is Water quality will not be not altered.	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 0 10	invertebrates and w foraging resource for	Il provide substrate for benthic recruitment of macroalgae and sessile will create a refuge for fish and other motile marine organisms. It will create a for sea turtles since preferred macroalgae have been documented to grow on e nearshore habitat of Southeast Florida.				
Score = sum of above scores/30 (if	1					
uplands, divide by 20)	If preservation a	s mitigation,			For impact assessment areas	
current or w/o pres with 0.200 0.867	Preservation adj Adjusted mitigat	ustment factor = ion delta =		FL=d	elta x acres=	
0.200 0.007	J					
	If mitigation					
			F	or mitigation assessment areas		
Delta = [with - current]	Time lag (t-fa	actor) =	1.03	REC	0.52 delta/(t-factor x risk)=	
0.667		1.25	NFG=	uena/(1-1a0101 X 115K)=		

For each impact assessment area:

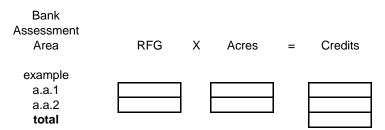
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

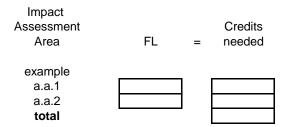
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

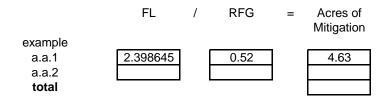


#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]

Site /Droje at Name		Application Number		A		omo or Number		
Site/Project Name Southern Palm Beach Island Co	omprehensive	Application Number	Assessment Area Name or Number					
Shore Stabilization Project (Pal		SAJ-2008-04086		Direct Temporary Impacts (<1 year)				
portion)								
Impact or Mitigation		Assessment conducted	d by:					
Impact (Direct Temporary <1 ye	ear)	CB&I	Area	(acres)	0.53	<u>                                     </u>		
	·							
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)			Not Present (0)		
The scoring of each	Condition is optimal and	Condition is less than						
indicator is based on what would be suitable for the	fully supports	optimal, but sufficient to maintain most	Minimal level of su wetland /surface		Condition is in:	sufficient to provide wetland/	surface water	
type of wetland or surface	wetlands/surface water functions	wetland/surface water	functions			functions		
water assessed		functions						
.500(6)(a) Location and Landscape Support w/o pres or current with 10 1	colonized pavemer the epibenthic com scleractinian corals Dasycladus, Halim the nearshore hard Pterogorigia, Muric habitat for immigra	nt. Benthic characterizat munities to be turf and r s, octocorals, bryozoans eda, and Laurencia. Sr Ibottom, including Sider ea, and Eunicea. The r ting larvae of many imp	tion surveys within macroalgae, and a s, and zoanthids. C mall (<3 cm) colon <i>astrea</i> spp. and S nearshore hardbor ortant fisheries sp	the pro also sup Commo ies of s Colenas ttom pro ecies. I	bject area rev opporting worm in macroalgal cleractinian c trea bournoni bvides an imp t is also provid	k with primarily low relie ealed the dominant com rrock, sponges, tunicates taxa are <i>Dictyota, Padin</i> orals have been docume . Common octocorals ar ortant settlement and nu des foraging habitat for j nd leatherback sea turtle	ponents of s, <i>a, Hypnea,</i> ented on e irsery uvenile	
.500(6)(b) Water Environment (n/a for uplands)       (n/a high wave energy with generally clear water habitat of the Atlantic Ocean with open circulation. It is often exposingly with generally clear water. Water quality will not be altered.         w/o pres or current       with         6       6						posed to		
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 10 1	organisms thriving macroalgae assem scleractinian corals	in this habitat for many blage and a diverse inv s, octocorals, bryozoans nd <i>Solenastrea bournor</i>	years (scleractinia rertebrate communis, and zoanthids. T	ans, larg nity in th The mos	ge sponges). ne form of wo st abundant se	ef) community, with som It supports a multi-specie rmrock, sponges, tunica cleractinian species are nt, but repeated burial of	es tes,	
Score = sum of above scores/30 (if uplands,								
divide by 20)	If preservation a	s mitigation,			For in	npact assessment areas		
current or w/o pres with 0.867 0.267	Preservation ad Adjusted mitigat	justment factor = ion delta =		FL=d	elta x acres=	0.319012378		
0.201	l							
	If mitigation				Ear milli	notion opposition		
Dolto - [with ourroat]	1				For mitigation assessment areas			
Delta = [with - current]	Time lag (t-fa	((()) =			RFG=delta	(t-factor x risk)=		
0.600	Risk factor =							

Site/Project Name		Application Number		Assess	ment Area Name or Number	
Southern Palm Beach Island C Shore Stabilization Project (Pa		SAJ-2008-04086		Mitigation for Direct Temp Impacts (<1 yr)		
portion) Impact or Mitigation Mitigation		Assessment conducted	d by:	Assessment date: Oct. 2014		
Searing Cuidence			Minimal	1)	Net Dresent (0)	
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 wetlands/surface water functions	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal (4 Minimal level of s wetland /surface functions	upport of e water	Not Present (0) Condition is insufficient to provide wetland/surface water functions	
.500(6)(a) Location and Landscape Support w/o pres or current with 0 9	water depth as the		hardbottom res		ated sandy substrate in similar kist in the adjacent area to facilitate	
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 6 6	The assessment ar				an with open circulation. It is often ty will not be not altered.	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 0 9	An artificial reef will provide substrate for benthic recruitment of macroalgae and sessile invert and will create a refuge for fish and other motile marine organisms. It will create a foraging res sea turtles since preferred macroalgae have been documented to grow on artificial reefs in the nearshore habitat of Southeast Florida.					
	·			-		
Score – sum of above scores/20 /#	If preservation as	s mitigation				
Score = sum of above scores/30 (if uplands, divide by 20)	li preservation a	o magaaon,			For impact assessment areas	
uplands, divide by 20) current or w/o pres with		ustment factor =		FL=de	For impact assessment areas	
uplands, divide by 20) current	Preservation adj	ustment factor =		FL=de		
uplands, divide by 20) current or w/o pres with	Preservation adj	ustment factor =			elta x acres=	
uplands, divide by 20) current or w/o pres with	Preservation adj Adjusted mitigati	iustment factor =	1.03	Fo		

For each impact assessment area:

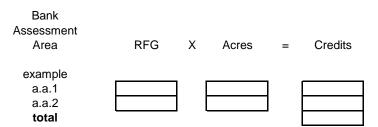
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

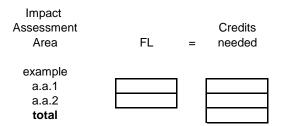
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

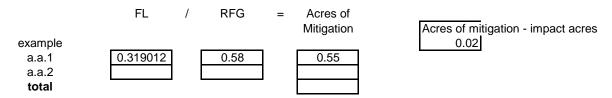


#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank





Site/Project Name		Application Number		Assessment Area Name or Number				
Southern Palm Beach Island Co	omprehensive	Application Number		A22622	anieni Alea Na			
Shore Stabilization Project (Pal		SAJ-2008-04086		Direct Temporary Impacts (>1 year)				
portion)	,							
Impact or Mitigation		Assessment conducted						
Impact (Direct Temporary > 1 ye	r)	CB&I	Area	(acres)	0.24			
Scoring Guidance	Optimal (10)	Modorata (7)	Minimal (4)			Not Present (0)		
The scoring of each		Moderate (7) Condition is less than	Winninda (4)			Not Present (0)		
indicator is based on what	fully supports optimal, but sufficient to Minimal level of support			Condition is ins	sufficient to provide wetland/	surface water		
would be suitable for the type of wetland or surface	wetlands/surface water	maintain most wetland/surface water	wetland /surface v functions	water		functions		
water assessed	functions	functions						
.500(6)(a) Location and Landscape Support w/o pres or current with 10 1	colonized pavemer the epibenthic com scleractinian corals Dasycladus, Halim the nearshore hard Pterogorigia, Muric habitat for immigra	nt. Benthic characterizat munities to be turf and it s, octocorals, bryozoans eda, and <i>Laurencia</i> . Sr Ibottom, including <i>Sider</i> ea, and <i>Eunicea</i> . The ting larvae of many imp	tion surveys within macroalgae, and a s, and zoanthids. C mall (<3 cm) colon <i>astrea</i> spp. and S nearshore hardbot ortant fisheries spe	the pro also sup commor ies of so colenast tom pro ecies. It	ject area reve porting wormin n macroalgal t cleractinian co <i>rea bournoni</i> . vvides an impo is also provic	k with primarily low relie ealed the dominant comp rock, sponges, tunicates axa are <i>Dictyota, Padina</i> orals have been docume . Common octocorals are ortant settlement and nu des foraging habitat for jund leatherback sea turtle	conents of a, <i>Hypnea,</i> ented on e rsery uvenile	
.500(6)(b) Water Environment (n/a for uplands)       The assessment area is in the nearshore habitat of the Atlantic Ocean with open circulation. It is often expenditude with generally clear water. Water quality will not be altered.         w/o pres or current with       with         6       6							posed to	
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 10 1	organisms thriving macroalgae assem scleractinian corals <i>Siderastrea</i> spp. a	The community structure is a high stress (low relief) to sub-climax (moderate relief) community, with some benthic organisms thriving in this habitat for many years (scleractinians, large sponges). It supports a multi-species macroalgae assemblage and a diverse invertebrate community in the form of wormrock, sponges, tunicates, scleractinian corals, octocorals, bryozoans, and zoanthids. The most abundant scleractinian species are <i>Siderastrea</i> spp. and <i>Solenastrea bournoni</i> . Size distribution indicates recruitment, but repeated burial of habitat limits succession and colony growth.						
Score = sum of above scores/30 (if uplands,	I							
divide by 20)	If preservation a	s mitigation,			For im	npact assessment areas		
current or w/o pres with	Preservation ad	justment factor =		FL=de	elta x acres=	0.14134411		
0.867 0.267	. inguesea magar							
	If mitigation							
				For mitigation assessment areas				
Delta = [with - current]	Time lag (t-fa	, i i i i i i i i i i i i i i i i i i i						
0.600	Risk factor =				RFG=delta/	(t-factor x risk)=		

0% (D ) (N				A 11 (1 AL 1					
Site/Project N		ch Island C	omprehensive	Application Number			Assessment Area Name or Number		
			Im Beach County	SAJ-2008-04086		•	Mitigation for Direct Temp Impacts (>1 yr)		
Impact or Miti	gation			Assessment conducted	d by:		ment date:		
Mitigation				CB&I Oct			014		
Scoring G	idanaa		Optimal (10)	Moderate (7)	Minim	ol (4)	Not Present (0)		
The scoring	of each		Condition is optimal and	Moderate (7) Condition is less than	Minima	di (4)	Not Present (0)		
indicator is based on what would be suitable for the			fully supports	optimal, but sufficient to maintain most	Minimal level of wetland /sur		Condition is insufficient to provide		
type of wetland	l or surface		wetlands/surface water functions	wetland/surface water	wetland/surface water functions		wetland/surface water functions		
water ass	essed			functions					
.500(6)(a) L w/o pres or current 0	ocation and Support	d Landscape with 7	water depth as the i		hardbottom re		ated sandy substrate in similar st in the adjacent area to facilitate		
.500(6)(b) W w/o pres or current 6	ater Enviro for uplands						n with open circulation. It is often y will not be not altered.		
1. Vegetation and/or and will create a re 2. Benthic Community sea turtles since pr				I provide substrate for benthic recruitment of macroalgae and sessile invertebrates fuge for fish and other motile marine organisms. It will create a foraging resource for referred macroalgae have been documented to grow on artificial reefs in the of Southeast Florida.					
			ı r		<u> </u>	·			
	m of above s nds, divide b	,	If preservation as	s mitigation,			For impact assessment areas		
current			Preservation adj	ustment factor -	1				
or w/o pres	or w/o pres with					FL=de	lta x acres=		
0.200		0.667	Adjusted mitigati	on delta =					
			4						
			If mitigation			Fo	or mitigation assessment areas		
Dolta	= [with - c		Time lag (t-fa	ector) –	1.03		0.45		
		anenij				RFG=d	elta/(t-factor x risk)=		
	0.467		Risk factor =	Risk factor = 1.00					

For each impact assessment area:

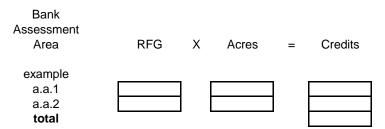
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

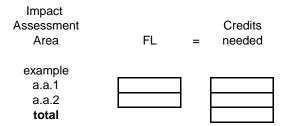
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

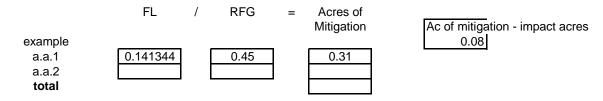


#### (b) Mitigation needed to offset impacts, when using a mitigation bank

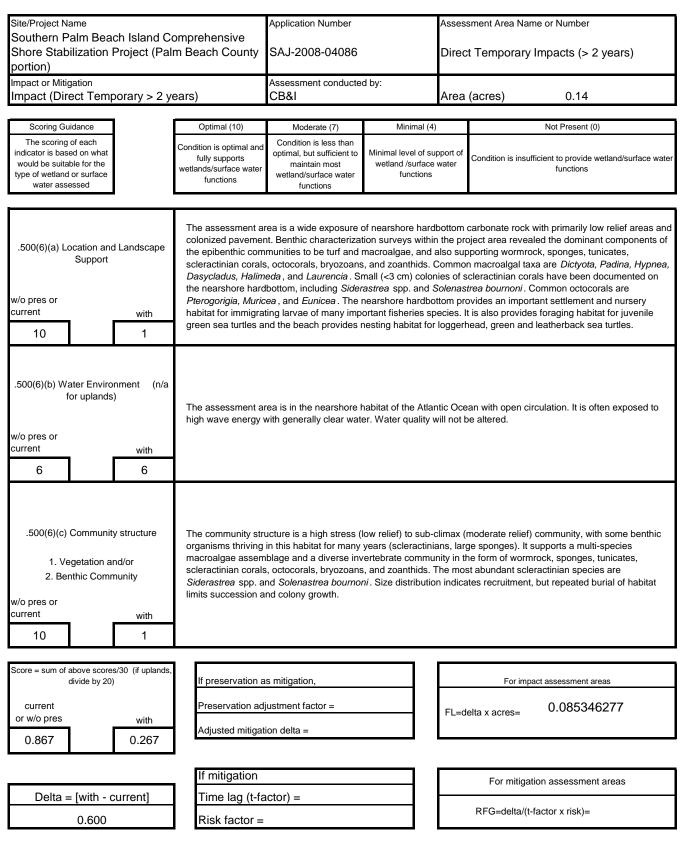
The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]



Site/Project N	ame			Application Number			Assessment Area Name or Number		
Southern P	alm Bea		omprehensive m Beach County	SAJ-2008-04086		-	tion for Direct Temp cts (>2 yr)		
Impact or Miti Mitigation	gation			Assessment conducter	d by:	Assess Oct. 2	ment date: 2014		
Cooring C:	vidanaa		Optimal (10)		Minimal	(4)	Net Present (0)		
Scoring Gu The scoring indicator is bas would be suita type of wetland water ass	of each ed on what ble for the for surface		Optimal (10) Condition is optimal and fully supports wetlands/surface water functions	Moderate (7) Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal Minimal level of wetland /surfa functio	Not Present (0) Condition is insufficient to provide wetland/surface water functions			
.500(6)(a) Li w/o pres or current 0	ocation and Support	d Landscape with 5	water depth as the		hardbottom re		ated sandy substrate in similar ist in the adjacent area to facilitate		
.500(6)(b) Wi t w/o pres or current 6	ater Enviro for uplands	•					an with open circulation. It is often ty will not be not altered.		
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community				fuge for fish and other r	notile marine o	rganisms. I	roalgae and sessile invertebrates t will create a foraging resource for ow on artificial reefs in the		
0		5							
	m of above s nds, divide b		If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres	1	with	Preservation adj Adjusted mitigat	justment factor =		FL=de	elta x acres=		
0.200		0.533							
			If mitigation			Fo	or mitigation assessment areas		
Delta =	Delta = [with - current] Time lag (t			actor) =	1.03		0.32		
0.333			Risk factor =		1.00	RFG=d	lelta/(t-factor x risk)=		

For each impact assessment area:

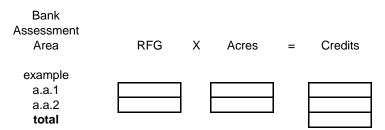
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

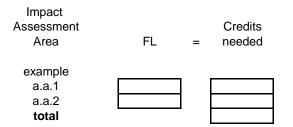
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

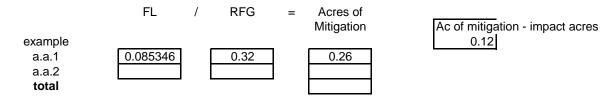


### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]

		A STREET AND A DESTREMAN					
Site/Project Name Southern Palm Beach Island Co	omprohonsivo	Application Number	/	Assessment Ar	ea Name or Number		
Shore Stabilization Project (Pal	•	SAJ-2008-04086	1	Indirect Impa	acts (1 year)		
portion)							
Impact or Mitigation Impact (Indirect Temporary 1 ye	ear)	Assessment conducted		Area (acres) 0.81			
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)		Not Present (0)		
The scoring of each indicator is based on what would be suitable for the	Condition is optimal and fully supports wetlands/surface water	Condition is less than optimal, but sufficient to maintain most	Minimal level of supp wetland /surface w		is insufficient to provide wetland/surface water functions		
type of wetland or surface water assessed	functions	wetland/surface water functions	functions				
.500(6)(a) Location and Landscape Support w/o pres or current with 10 1	colonized pavemer the epibenthic com scleractinian corals Dasycladus, Halim the nearshore hard Pterogorigia, Muric habitat for immigrat	nt. Benthic characterizat munities to be turf and r s, octocorals, bryozoans eda, and Laurencia. Sr Ibottom, including Sider ea, and Eunicea. The r ting larvae of many imp	tion surveys within t macroalgae, and al- s, and zoanthids. Co mall (<3 cm) colonie astrea spp. and So nearshore hardbotte ortant fisheries spe	the project area so supporting v ommon macroa es of scleractini olenastrea bour om provides an cies. It is also p	e rock with primarily low relief areas and a revealed the dominant components of vormrock, sponges, tunicates, Ilgal taxa are <i>Dictyota, Padina, Hypnea,</i> ian corals have been documented on <i>noni</i> . Common octocorals are a important settlement and nursery provides foraging habitat for juvenile en and leatherback sea turtles.		
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current with 6 6		rea is in the nearshore h with generally clear wate			open circulation. It is often exposed to I.		
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 10 1	organisms thriving macroalgae assem scleractinian corals	tructure is a high stress (low relief) to sub-climax (moderate relief) community, with some benthic g in this habitat for many years (scleractinians, large sponges). It supports a multi-species mblage and a diverse invertebrate community in the form of wormrock, sponges, tunicates, ls, octocorals, bryozoans, and zoanthids. The most abundant scleractinian species are and <i>Solenastrea bournoni</i> . Size distribution indicates recruitment, but repeated burial of habitat and colony growth.					
Score = sum of above scores/30 (if uplands, divide by 20)	If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres with 0.867 0.267	Preservation adj Adjusted mitigat	iustment factor =		FL=delta x acr	<sub>es=</sub> 0.486313627		
Della faith d	If mitigation	- ( - x)	[	For	mitigation assessment areas		
Delta = [with - current]	Time lag (t-fa	ictor) =	RFG=delta/(t-factor x risk)=				
0.600	Risk factor =						

Site/Project Name	0			Application Number		Δ <u>ε</u> ς	sment Area Name or Number		
Southern Paln	n Bead		omprehensive m Beach County	SAJ-2008-04086		Mitiga	Mitigation for Indirect Temp Impacts (1 yr)		
Impact or Mitigati Mitigation	ion			Assessment conducted by: CB&I			Assessment date: Oct. 2014		
						0			
Scoring Guidar The scoring of e			Optimal (10)	Moderate (7) Condition is less than	Minimal (	4)	Not Present (0)		
indicator is based of would be suitable type of wetland or s water assessed	on what for the surface		Condition is optimal and fully supports wetlands/surface water functions	optimal, but sufficient to maintain most wetland/surface water functions		e water	Condition is insufficient to provide wetland/surface water functions		
.500(6)(a) Loca Si w/o pres or current 0	tion and upport	I Landscape with 8	water depth as the		hardbottom res		lated sandy substrate in similar kist in the adjacent area to facilitate		
.500(6)(b) Water Environment for uplands)       (n/a for uplands)         The assessment area is in the nearshore habitat of the Atlantic exposed to high wave energy with generally clear water. Water w/o pres or current with         6       6									
.500(6)(c) Cor 1. Veget 2. Benthi w/o pres or current 0	tation ar	nd/or	and will create a ref sea turtles since pre	fuge for fish and other n	notile marine or	ganisms.	roalgae and sessile invertebrates It will create a foraging resource for ow on artificial reefs in the		
Score = sum of uplands,	f above so , divide by	· ·	If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres 0.200	Ī	with 0.733	Preservation adj Adjusted mitigat	ustment factor = ion delta =		FL=de	elta x acres=		
0.200		0.700	l						
			If mitigation			F	or mitigation assessment areas		
Delta = [v	with - c	urrent]	Time lag (t-fa	-factor) = 1.03			0.52		
0	).533		Risk factor =		1.00	RFG=0	delta/(t-factor x risk)=		

For each impact assessment area:

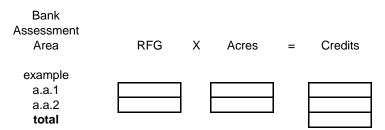
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

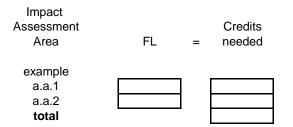
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

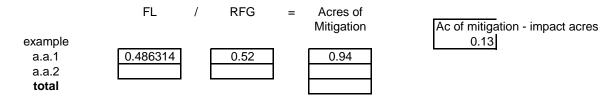


### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]

Site/Project Name			Application Number			Assessment Area Name or Number			
Southern Palm Beach Is	and Co	omprehensive	11						
Shore Stabilization Proje			SAJ-2008-04086		Indire	ct Tempoi	ary Impacts	(2 years)	
portion)									
Impact or Mitigation			Assessment conducted	d by:					
Impact (Indirect Tempora	ary 2 ye	ars)	CB&I			(acres)	0.67	1	
	r					1	N / D	. (0)	
Scoring Guidance		Optimal (10)	Moderate (7)	Minimal (4)			Not Presen	t (0)	
The scoring of each indicator is based on what would be suitable for the		Condition is optimal and fully supports wetlands/surface water	Condition is less than optimal, but sufficient to maintain most	Minimal level of sup wetland /surface		Condition is ir	sufficient to provic functions	le wetland/surface water	
type of wetland or surface water assessed		functions	wetland/surface water functions	functions	ons				
	L								
.500(6)(a) Location and Land Support w/o pres or current	dscape with	colonized pavement the epibenthic comu- scleractinian corals <i>Dasycladus, Halime</i> the nearshore hard <i>Pterogorigia, Murico</i> habitat for immigrat	ea is a wide exposure of it. Benthic characterizat munities to be turf and i of, octocorals, bryozoans eda, and Laurencia. Sr bottom, including Sider ea, and Eunicea. The r ing larvae of many imp nd the beach provides r	ion surveys within macroalgae, and a , and zoanthids. C mall (<3 cm) colon <i>astrea</i> spp. and S nearshore hardbot ortant fisheries sp	the pro also sup commor ies of s colenasi tom pro ecies. It	pject area rev pporting worm n macroalgal cleractinian o trea bournon pvides an imp t is also provi	realed the domin nrock, sponges, taxa are <i>Dictyo</i> corals have bee <i>i</i> . Common octo portant settleme des foraging ha	nant components of tunicates, <i>ita, Padina, Hypnea,</i> n documented on ocorals are nt and nursery ibitat for juvenile	
.500(6)(b) Water Environmen for uplands) w/o pres or current	ut (n/a with 6		ea is in the nearshore h vith generally clear wate				circulation. It is	often exposed to	
.500(6)(c) Community struct 1. Vegetation and/or 2. Benthic Community w/o pres or current 10		The community structure is a high stress (low relief) to sub-climax (moderate relief) community, with some benthic organisms thriving in this habitat for many years (scleractinians, large sponges). It supports a multi-species macroalgae assemblage and a diverse invertebrate community in the form of wormrock, sponges, tunicates, scleractinian corals, octocorals, bryozoans, and zoanthids. The most abundant scleractinian species are <i>Siderastrea</i> spp. and <i>Solenastrea bournoni</i> . Size distribution indicates recruitment, but repeated burial of habitat limits succession and colony growth.							
Score = sum of above scores/30 (i	if uplands,								
divide by 20)	. ,	If preservation as	s mitigation,			For i	mpact assessmen	t areas	
	with .267	Preservation adj Adjusted mitigati			FL=de	elta x acres=	0.4035	646797	
0.867 0	.201								
		If mitigation				For miti	gation assessm	ent areas	
Delta = [with - current	nt]	Time lag (t-fa							
0.600		Risk factor =				RFG=delta	/(t-factor x risk):	=	

Southern P Shore Stab	Site/Project Name Southern Palm Beach Island Comprehensive Shore Stabilization Project (Palm Beach County			Application Number SAJ-2008-04086			Assessment Area Name or Number Mitigation for Indirect Temp Impacts (2 yr)		
portion) Impact or Miti Mitigation	gation			Assessment conducted	d by:	Assess	Assessment date: Oct. 2014		
Scoring G	lidance		Optimal (10)	Moderate (7)	Minimal (	4)	Not Present (0)		
The scoring indicator is bas would be suita type of wetland water ass	of each ed on what able for the d or surface		Condition is optimal and fully supports wetlands/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of s wetland /surfac functions	f support of ace water wetland/surface water functions			
.500(6)(a) L w/o pres or current 0	ocation and Support	l Landscape with 6	water depth as the		hardbottom res		lated sandy substrate in similar xist in the adjacent area to facilitate		
.500(6)(b) W w/o pres or current 6	ater Enviro for uplands						an with open circulation. It is often ity will not be not altered.		
1. Ve	Communit egetation a nthic Comn	nd/or	and will create a ref sea turtles since pre	I provide substrate for benthic recruitment of macroalgae and sessile invertebrates fuge for fish and other motile marine organisms. It will create a foraging resource for referred macroalgae have been documented to grow on artificial reefs in the of Southeast Florida.					
Score = su	m of above s	cores/30 (if	r I			<b>—</b>			
	nds, divide b	,	If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres	1 1	with	Preservation adj Adjusted mitigat	ustment factor = ion delta =		FL=de	elta x acres=		
0.200		0.600							
r			If mitigation			F	or mitigation assessment areas		
Delta :	= [with - c	current]	Time lag (t-fa	actor) =	1.03	RFG=0	0.39 delta/(t-factor x risk)=		
	0.400		Risk factor =		1.00				

For each impact assessment area:

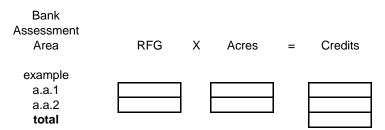
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

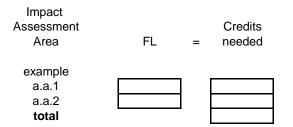
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

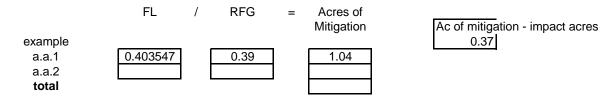


### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]

Site/Project Name	Application Number	A	Assessment Area Name or Number			
Southern Palm Beach Island Co Shore Stabilization Project (Pal	SAJ-2008-04086	c	Secondary Impacts			
portion)	SAJ-2000-04000	2				
Impact or Mitigation	Assessment conducted	d by:				
Impact (secondary)		CB&I	-	Area (acres) 0.75		
Scoring Guidance	Optimal (10)	Moderate (7)	Minimal (4)		Not Present (0)	
The scoring of each indicator is based on what	Condition is optimal and	Condition is less than optimal, but sufficient to maintain most	Minimal level of suppo	ort of		
would be suitable for the	fully supports wetlands/surface water		wetland /surface wa			
type of wetland or surface water assessed	functions	wetland/surface water functions	functions			
.500(6)(a) Location and Landscape Support w/o pres or current with 10 9	The assessment area is a wide exposure of nearshore hardbottom carbonate rock with primarily low relief areas and colonized pavement. Benthic characterization surveys within the project area revealed the dominant components of the epibenthic communities to be turf and macroalgae, and also supporting wormrock, sponges, tunicates, scleractinian corals, octocorals, bryozoans, and zoanthids. Common macroalgal taxa are <i>Dictyota, Padina, Hypnea, Dasycladus, Halimeda</i> , and <i>Laurencia</i> . Small (<3 cm) colonies of scleractinian corals have been documented on the nearshore hardbottom, including <i>Siderastrea</i> spp. and <i>Solenastrea bournoni</i> . Common octocorals are <i>Pterogorigia, Muricea</i> , and <i>Eunicea</i> . The nearshore hardbottom provides an important settlement and nursery habitat for immigrating larvae of many important fisheries species. It is also provides foraging habitat for juvenile green sea turtles and the beach provides nesting habitat for loggerhead, green and leatherback sea turtles.					
500(6)(b) Water Environment (n/a for uplands)       (n/a for uplands)         w/o pres or current with       The assessment area is in the nearshore habitat of the Atlantic Ocean with open circulation. It is often exposed high wave energy with generally clear water. Water quality will not be altered.         6       6						
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current with 10 9	organisms thriving in this habitat for many years (scleractinians, large sponges). It supports a multi-species macroalgae assemblage and a diverse invertebrate community in the form of wormrock, sponges, tunicates, scleractinian corals, octocorals, bryozoans, and zoanthids. The most abundant scleractinian species are <i>Siderastrea</i> spp. and <i>Solenastrea bournoni</i> . Size distribution indicates recruitment, but repeated burial of habitat limits succession and colony growth.					
Seere - sum of above seeres/20, (if uplands			——————————————————————————————————————			
Score = sum of above scores/30 (if uplands, divide by 20)	If preservation a	s mitigation,		For impac	t assessment areas	
current or w/o pres with 0.867 0.800	Preservation adj Adjusted mitigati	iustment factor = ion delta =		FL=delta x acres=	0.049674873	
	1					
	If mitigation			For mitigatio	n assessment areas	
Delta = [with - current]	Time lag (t-fa	For mitigation assessment areas				
0.067		/		RFG=delta/(t-fa	ctor x risk)=	
0.067	Risk factor =					

Site/Project N	lame			Application Number		Assess	sment Area Name or Number	
Southern Palm Beach Island Comprehensive						Assessment Alea Name of Number		
Shore Stabilization Project (Palm Beach County portion)			SAJ-2008-04086		Mitiga	ation for Secondary Impacts		
Impact or Mitigation			Assessment conducted	d by:		sment date:		
Mitigation				CB&I		Oct. 2	2014	
Scoring G	uidance		Optimal (10)	Moderate (7)	Minimal	(4)	Not Present (0)	
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed		Condition is optimal and fully supports wetlands/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions		ce water	Condition is insufficient to provide wetland/surface water functions		
			-					
.500(6)(a) L w/o pres or current 0	ocation and Support	d Landscape with 10	water depth as the		hardbottom res		dated sandy substrate in similar xist in the adjacent area to facilitate	
		10						
.500(6)(b) W w/o pres or current 6	ater Enviro for uplands						an with open circulation. It is often lity will not be not altered.	
1. Vegetation and/or     and will create a ref       2. Benthic Community     sea turtles since pre				I provide substrate for benthic recruitment of macroalgae and sessile invertebrates fuge for fish and other motile marine organisms. It will create a foraging resource for referred macroalgae have been documented to grow on artificial reefs in the of Southeast Florida.				
Canada			ı					
Score = sum of above scores/30 (if uplands, divide by 20)		If preservation a	s mitigation,			For impact assessment areas		
current or w/o pres with			djustment factor = FL=delta x acres=					
0.200		0.867	Adjusted mitigat	ion delta =				
L			4					
			If mitigation			F	or mitigation assessment areas	
Delta = [with - current]			Time lag (t-fa	actor) =	1.03	-	0.52 delta/(t-factor x risk)=	
0.667		Risk factor =		1.25				

For each impact assessment area:

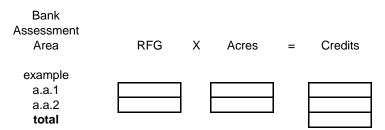
(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

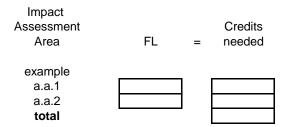
### (a) Mitigation Bank Credit Determination

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

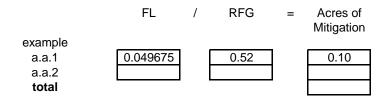


#### (b) Mitigation needed to offset impacts, when using a mitigation bank

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assesses in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.



#### (c) Mitigation needed to offset impacts, when not using a bank



Form 62-345.900(3), F.A.C. [effective date]

For each impact assessment area:

(FL) Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:

(RFG) Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable/((t-factor)(risk))

### (a) Mitigation Bank Credit Determination

### (b) Mitigation needed to offset impacts, when using a mitigation bank

### (c) Mitigation needed to offset impacts, when not using a bank

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and the total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.

	Impact Types	FL	/	RFG	=	Acres of Mitigation	*Note: for temporary impacts, <i>Mitigation</i> = ( <i>FL/RFG</i> ) - <i>Impact Area</i>
1	Permanent	2.40	]	0.52		4.63	]
	Direct Temporary						
2	(< 1 Year)	0.32		0.58		0.02	-
	Direct Temporary						
3	(>1 year)	0.14		0.45		0.08	
	Direct Temporary						
4	(>2 year)	0.09		0.32		0.12	
	Indirect Temp. (1		1				1
5	year)	0.49		0.52		0.13	
	Indirect Temp. (2						1
6	years)	0.40		0.39		0.37	
	Secondary						
7	(ETOF)	0.05		0.52		0.10	
	total					5.44	

Form 62-345.900(3), F.A.C. [effective date]