

PELICAN BAY SERVICES DIVISION

Municipal Service Taxing and Benefit Unit

NOTICE OF PUBLIC MEETING

MARCH 30, 2021

THE CLAM BAY COMMITTEE OF THE PELICAN BAY SERVICES DIVISION WILL MEET AT 9:00 AM ON TUESDAY, MARCH 30 AT THE COMMUNITY CENTER AT PELICAN BAY, 8960 HAMMOCK OAK DRIVE, NAPLES, FLORIDA 34108.

AGENDA

1. Roll call
2. Agenda approval
3. Approval of 01/12/2021 meeting minutes
4. Audience comments
5. Water Quality
 - a. Highlights and recommendations from 2020 annual report
 - b. 2021 reports: Six-month and annual report
 - c. Review and possibly reduce parameters for berm sites
6. Clam Pass
 - a. Highlights and recommendations from 2020 annual report
 - b. 2021 reports: biannual bathymetric surveys
 - c. Tidal ratio results for February
7. Clam Bay
 - a. Proposal for scaevola treatment/removal
 - b. Draft of FY22 budget
 - c. Canoe trail marker 8 and signs needing cleaning
8. Beach renourishment
 - a. Update on engineering work
9. Boater safety signage
 - a. Update on status of ordinance
10. Next meeting
11. Adjournment

The 2020 Water Quality Report can be accessed via this link:

<https://www.colliercountyfl.gov/your-government/pelican-bay-services-division>

ANY PERSON WISHING TO SPEAK ON AN AGENDA ITEM WILL RECEIVE UP TO THREE (3) MINUTES PER ITEM TO ADDRESS THE BOARD. THE BOARD WILL SOLICIT PUBLIC COMMENTS ON SUBJECTS NOT ON THIS AGENDA AND ANY PERSON WISHING TO SPEAK WILL RECEIVE UP TO THREE (3) MINUTES. THE BOARD ENCOURAGES YOU TO SUBMIT YOUR COMMENTS IN WRITING IN ADVANCE OF THE MEETING. ANY PERSON WHO DECIDES TO APPEAL A DECISION OF THIS BOARD WILL NEED A RECORD OF THE PROCEEDING PERTAINING THERETO, AND THEREFORE MAY NEED TO ENSURE THAT A VERBATIM RECORD IS MADE, WHICH INCLUDES THE TESTIMONY AND EVIDENCE UPON WHICH THE APPEAL IS TO BE BASED. IF YOU ARE A PERSON WITH A DISABILITY WHO NEEDS AN ACCOMMODATION IN ORDER TO PARTICIPATE IN THIS MEETING YOU ARE ENTITLED TO THE PROVISION OF CERTAIN ASSISTANCE.

**PELICAN BAY SERVICES DIVISION
CLAM BAY COMMITTEE MEETING
JANUARY 12, 2021**

The Clam Bay Committee of the Pelican Bay Services Division met on Tuesday, January 12 at 9:00 a.m. at the Community Center, 8960 Hammock Oak Dr., Naples, Florida 34108. In attendance were:

Clam Bay Committee

Susan O'Brien, Chairman
Denise McLaughlin

Rick Swider
Michael Weir

Pelican Bay Services Division Staff

Neil Dorrill, Administrator
Chad Coleman, Operations Manager
Darren Duprey, Assoc. Project Manager

Karin Herrmann, Ops. Analyst (*absent*)
Lisa Jacob, Project Manager
Barbara Shea, Admin. Assistant

Also Present

Mohamed Dabees, Humiston & Moore

Jeremy Sterk, Earth Tech

APPROVED AGENDA (AS AMENDED)

1. Roll call
2. Agenda approval
3. Approval of 10/27/2020 meeting minutes
4. Audience comments
5. Clam Bay
 - a. Highlights and recommendations from annual report
 - b. Estimated cost of implementing recommendations
 - c. Proposal for scaevola treatment
 - i. Update on other exotic treatment (*add-on*)
 - d. Update on canoe trail marker 8
 - e. Draft article for PB Post
6. Boater safety signage
 - a. Update from Coastal Zone Management
7. Clam Pass
 - a. Update on recent dredging and lessons learned
 - b. Results of post dredging survey
 - c. Next bathymetric survey
 - d. Tidal ratio results for days since dredging
 - e. 2020 physical and tidal monitoring report due March 22, 2021
8. Water Quality
 - a. 2020 WQ report due March 22, 2021

Pelican Bay Services Division Clam Bay Committee Meeting
January 12, 2021

- 8.5. Status on contracts for Clam Bay Monitoring and Water Quality Reporting (*add-on*)
9. Next meeting: March 30, 2021 at 1:30 p.m. (Community Center)
10. Adjournment

ROLL CALL

All members were present and a quorum was established

AGENDA APPROVAL

Ms. McLaughlin motioned, Ms. O'Brien seconded to approve the agenda as amended with the addition of items #5ci and #8.5. The motion carried unanimously.

APPROVAL OF 10/27/2020 MEETING MINUTES

Mr. Weir motioned, Ms. McLaughlin seconded to approve the 10/27/2020 meeting minutes as presented. The motion carried unanimously.

AUDIENCE COMMENTS

None

CLAM BAY

HIGHLIGHTS AND RECOMMENDATIONS FROM ANNUAL REPORT

Mr. Sterk, Environmental Consultant with Earth Tech, responded to questions/comments from committee members on his 2020 Annual Clam Bay Monitoring & Management Report. His comments included the following.

- Scaevola is invasive to the gopher tortoise habitat.
- The Clam Bay Management Plan includes archeological monitoring of three sites to ensure that these sites have not been disturbed.
- There are four stressed areas of mangroves which we have been monitoring for several years. These areas are not increasing or decreasing in size. It is recommended that we continue site visits, drone monitoring, and photo documentation of these areas, on a semiannual basis. Maintenance work on hand cut channels this year will target these four areas. At this time, it is unknown if these channels exist in two of these areas.

Ms. O'Brien commented that she would like the 2020 Clam Bay Monitoring Report to be posted on our PBSB webpage. Mr. Coleman commented that this report is not ADA compliant, and it may not be possible to post the report on our webpage. Ms. O'Brien suggested that staff problem-solves this issue.

ESTIMATED COST OF IMPLEMENTING RECOMMENDATIONS

Mr. Sterk commented that his recommendations would not cause any increase to the work order in place for Clam Bay monitoring by Earth Tech.

PROPOSAL FOR SCAEVOLA TREATMENT

Mr. Sterk reported that he is working on a scope and opinion of estimated cost for a scaevola treatment proposal. Once completed, the project will go out to bid. He commented that

Pelican Bay Services Division Clam Bay Committee Meeting
January 12, 2021

a site visit with staff occurred last week to determine access, which is a major concern for this project.

Mr. Sterk commented that the County's Coastal Zone Dept. has no immediate plans for any scaevola treatment projects. He noted that the Bay Colony Association has recently completed a "hand removal" scaevola removal project, and the PBF recently completed a scaevola removal project near South Beach just prior to their South Beach renovation project.

Mr. Sterk commented that our project will be carefully scheduled to occur outside of turtle nesting season and shorebird nesting season. He recommended that after the project is completed, quarterly maintenance should be completed in the subsequent year, and then at lesser intervals in future years. He also noted that replanting will be required.

UPDATE ON OTHER EXOTIC TREATMENT (ADD-ON)

Ms. Jacob commented that the 2021 exotic vegetation removal project (including 13 tasks for Clam Bay and Water Management areas) has been awarded to Aquagenix, as low bidder. Ms. O'Brien asked if in FY2022 bids for Clam Bay exotic treatment could be requested separately from Water Management exotic treatment. Ms. O'Brien requested additional information on a targeted area (5.21 acres) for exotic removal. Mr. Sterk commented that this area was chosen for this year's project as it includes numerous large exotic hardwood trees. Ms. O'Brien suggested that staff and/or Mr. Sterk determine whether this area is part of the "wetlands area" (PBF property) or Clam Bay.

UPDATE ON CANOE TRAIL MARKER 8

Mr. Sterk commented that he recently spoke with Mr. Chris D'Arco, Coastal Zone Management Division, who confirmed that the repair of canoe trail marker 8 is on his list of needed repairs. Mr. Sterk suggested the preemptive replacement of all the marker poles. Ms. O'Brien noted that the Clam Bay Report found that several of these signs are dirty. Mr. Sterk responded that he will look into whether these signs are "cleanable." Ms. O'Brien suggested the possibility of staff cleaning the canoe trail markers.

DRAFT ARTICLE FOR PB POST

Mr. Weir suggested that the article include a discussion of the decision to close South Beach for a brief time during the Clam Pass maintenance project, during the holiday season. Mr. Dorrill commented that it was the Pelican Bay Foundation who made the decision to close South Beach. This was clearly a safety issue. He noted that the original goal was for the project to be completed prior to the Christmas holiday. Dr. Dabees, Coastal Engineer with Humiston & Moore, commented that he coordinated with PBF staff on the day that regrading sand on South Beach had to occur. Ms. O'Brien suggested that the article address the reason why South Beach was closed at the last minute. Dr. Dabees commented that the one-day beach closure was just one day of inconvenience to PB residents. However, if a less flexible plan had been in place, then it may have been necessary to close the beach for one to two weeks. Dr. Dabees commented that on the day of the South Beach regrading, the PBF was informed, who in turn notified tram station attendants to announce the closure of South Beach for the day to residents.

Mr. Dorrill commented that we are working on a communications plan for the sidewalk project. He suggested that we are careful when referring to our Clam Pass maintenance/dredging projects, and noted that the perception of a hydraulic dredging project is quite different from a maintenance regrading project. Ms. O'Brien commented that sand was dredged from Clam Pass

**Pelican Bay Services Division Clam Bay Committee Meeting
January 12, 2021**

in December. Mr. Swider commented that our December Clam Pass project was a successful well-run project.

BOATER SAFETY SIGNAGE

UPDATE FROM COASTAL ZONE MANAGEMENT

Ms. O'Brien commented that a map of Clam Bay identifying the locations of the five boater safety signs was included in the agenda packet.

CLAM PASS

UPDATE ON RECENT DREDGING AND LESSONS LEARNED

Dr. Dabees provided a post-construction photo of Clam Pass to the committee. He commented on the recent Clam Pass project which included the following observations.

- Our contractor TSI Disaster Recovery LLC provided us with excellent work.
- The contractor, with great competence and equipment, was able to sweep Section "B" to our template, taking out 3000 yards of sand.
- The County's Park Shore beach renourishment project likely caused the excess sand to build up in Clam Pass.
- Although the final survey has not been completed, it is estimated that 10,000 yards of sand were removed from Clam Pass.
- Once the final survey is received, there will be a change order for the contractor, based on the survey.

Mr. Dorrill reported that when we had notified Mr. Hoppensteadt, PBF President, that extra sand would be placed on South Beach, he agreed to pay for the sand, estimated at \$40,000. Mr. Dorrill also noted that based on conversations with this contractor, that the contractor will continue to bid on our future projects.

Ms. McLaughlin commented that a lesson learned would be that whenever the County does a beach renourishment project south of Clam Pass, that it is inevitable that a Clam Pass maintenance project will follow.

Ms. O'Brien expressed concerns on the impact on Clam Pass if the County were to proceed in completing a beach resiliency project.

RESULTS OF POST DREDGING SURVEY

Dr. Dabees commented that the current bathymetric survey of all Clam Pass sections is in the process of being completed.

NEXT BATHYMETRIC SURVEY

Dr. Dabees commented that the last annual bathymetric survey was completed in May 2020. He has not made a decision on when to best schedule the 2021 annual survey.

TIDAL RATIO RESULTS FOR DAYS SINCE DREDGING

Dr. Dabees commented that he has not processed any tidal ratio data since the December Clam Pass project was completed.

2020 PHYSICAL AND TIDAL MONITORING REPORT DUE MARCH 22, 2021

**Pelican Bay Services Division Clam Bay Committee Meeting
January 12, 2021**

Ms. O'Brien commented that the 2020 physical and tidal monitoring report is due on March 22, 2021.

WATER QUALITY

2020 WQ REPORT DUE MARCH 22, 2021

Ms. O'Brien commented that the due date for the 2020 WQ Report is March 22.

STATUS ON CONTRACTS FOR C.B. MONITORING AND WQ REPORTING (ADD-ON)

Ms. Jacob commented that our existing Clam Bay monitoring contract with Earth Tech expires in March 2022. In anticipation of that expiration, staff will use the County's Professional Engineering Services for Environmental Engineering contract to bid out the next Clam Bay monitoring contract.

Ms. Jacob commented that the existing WQ monitoring contract expires in June 2021. She discussed the following two options to replace this contract: (1) go out for bid under the County's Professional Engineering Services contract or (2) have Turrell Hall work as a subcontractor under the existing Earth Tech contract.

NEXT MEETING

Ms. O'Brien commented that the next meeting will be held on March 30, which will include discussion on the 2020 WQ Report and the 2020 Physical and Tidal Monitoring Report.

ADJOURNMENT

The meeting was adjourned at 10:33 a.m.

Susan O'Brien, Chairman

Minutes approved [] *as presented* OR [] *as amended* ON [] *date*

Invoice Date: 02/08/21

Pollution Control Laboratory Billing

Invoice Number: 1020_PBCB
Pollution Control Revenue Number: 114-178975-487999
Project Name: CLAMBAY

To: Lisa Jacob
Pelican Bay Services
6200 Watergate Way
Naples, FL 34108

Samples received on: 10/07/20

Sample References: AF62781 AF62782 AF62783 AF62784 AF62785 AF62786 AF62787 AF62788 AF62789
AF62790 AF62791 AF63088 AF63089 AF63090 AF63091 AF63092 AF63093 AF63094 AF63095
AF63096 AF63352 AF63353 AF63354 AF63355 AF63356 AF63357 AF63358 AF63359 AF63360 AF63361

Detailed Invoice Information

Clam Bay

Chlorophyll a	31	\$9.74	\$301.94
Nitrogen- Total Kjeldahl	31	\$11.61	\$359.91
Nitrate-Nitrite (N)	31	\$7.00	\$217.00
Nitrite (N)	31	\$8.59	\$266.29
Orthophosphate (P)	31	\$8.59	\$266.29
Copper	31	\$8.71	\$270.01
Ammonia	31	\$8.81	\$273.11
Phosphorus- Total	31	\$9.71	\$301.01
Field Sampling	Oct/Nov/Dec		\$1,253.07
Invoice Total			\$3,508.63

We appreciate your business and your continued support. We remain committed to supplying you the highest quality analytical results possible. If you have any questions concerning this invoice, please contact us at (239) 252-6079

Electronic Data Deliverable Location: G:\Labs\Analytical Services\Projects\Clam Bay\2020\IST_QTR_FY21

COLLIER COUNTY POLLUTION CONTROL DEPARTMENT QUOTE FOR SERVICES

Project: Pelican Bay Berm Monitoring FY18 - FY20

Client: Marion Bolick/Lisa Jacob
Company: Pelican Bay Services
Due Date: On-going

Project Description: Collect and analyze water quality samples from 6 sites monthly within Pelican Bay Ber samples includes 1 field blank monthly, and one replicate quarterly.

Reporting Requirements: ADaPT data reports will be submitted quarterly 45 days after the last month of e Field Data Deliverable and Lab Data Deliverables will be submittted 45 days after the last month of each qu will be QA/QC'd and uploaded to FDEP's WIN database annually.

Special Instructions:

Field Services

Task	Hourly Rate	Field Time per event	# of Events	Total
Field Sampling	\$32.13	3.0	12.0	\$1,156.68
Field Sampling	\$32.13	3.0	12.0	\$1,156.68
Total Field				\$2,313.36

Analytical Services

Parameter	Unit Cost	*Quantity	Total Cost
Ammonia	\$8.81	88	\$775.28
TSS	\$8.74	88	\$769.12
Copper	\$8.71	88	\$766.48
Dissolved Oxygen (Field)	\$0.00	88	\$0.00
Nitrate	\$8.59	88	\$755.92
Nitrite	\$8.59	88	\$755.92
TN calc.	\$0.00	88	\$0.00
Nitrogen- Total Kjeldahl	\$11.61	88	\$1,021.68
Orthophosphate (P)	\$8.59	88	\$755.92
pH (Field)	\$0.00	88	\$0.00
Calcium	\$8.71	88	\$766.48
Magnesium	\$8.71	88	\$766.48
Phosphorus- Total	\$9.71	88	\$854.48
Salinity (Field)	\$0.00	88	\$0.00
Secchi Depth	\$0.00	88	\$0.00
Specific Conductivity (Field)	\$0.00	88	\$0.00
Temperature (Field)	\$0.00	88	\$0.00

Berm sites

Quote Date: 3/25/21

By: R. Watkins

Quote good for 30 days

"Restoring Beaches as Natural Coastal Systems"

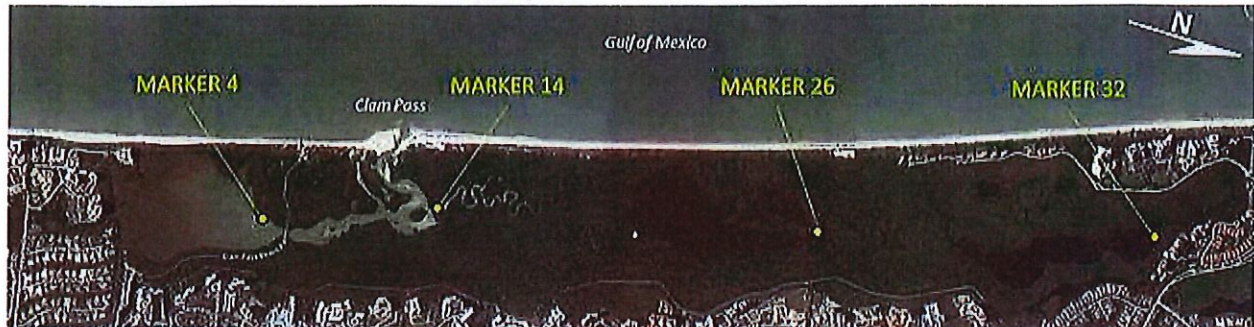


HUMISTON & MOORE
ENGINEERS
Consulting Coastal Engineers

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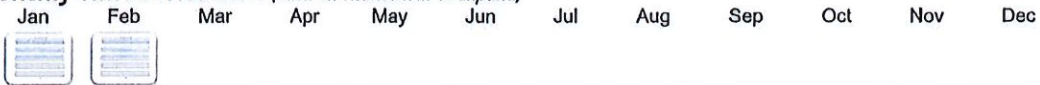
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Clam Pass Tide Monitoring - [Click here for Maintenance Dredging Project details](#)

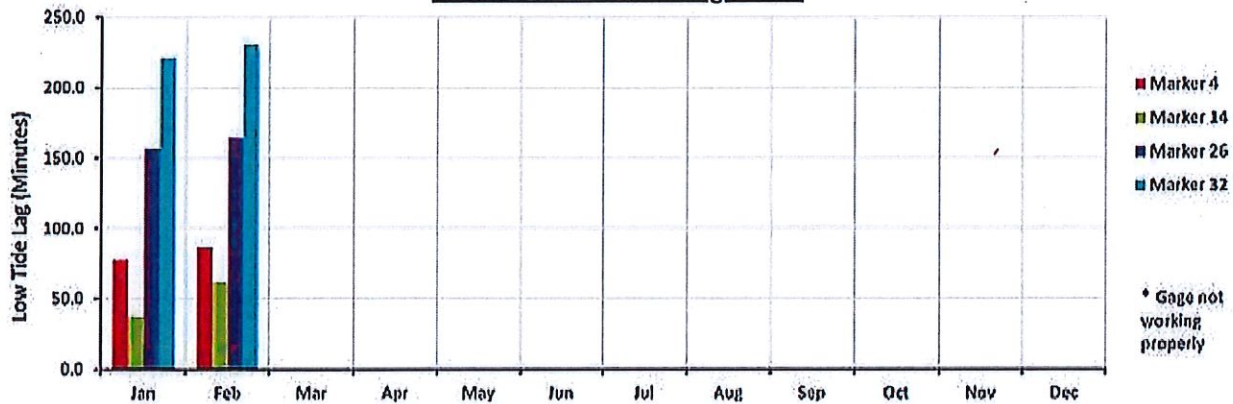


Tide Gages Location

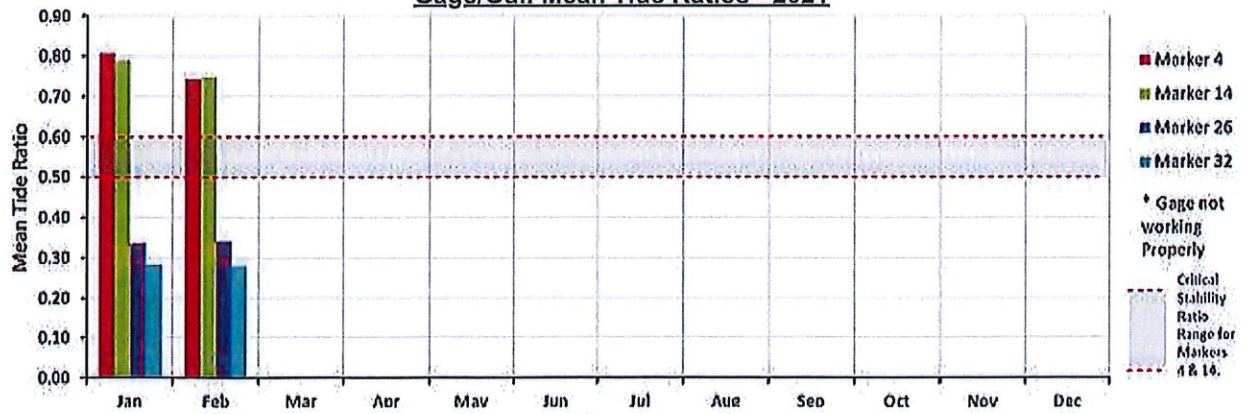
Monthly Time Series 2021 (Click on Thumbnails to Expand)



Mean Low Tide Time Lag - 2021



Gage/Gulf Mean Tide Ratios - 2021



Gage/Gulf Mean Tide Ratios - 2020

Scaevola removal/eradication scope of work and estimated costs for budgetary purposes
Total estimated cost range is \$210,000 to \$360,000 depending upon contractor's means and methods.

Assumptions:

- Haul route shall be designated from work area to beach ingress/egress location.
- Staging area is within close proximity to ingress/egress location for dumpsters, trailers and work vehicle.
- Approval of mechanical mulching within the beach dunes is approved by all local and state agencies. **Use of mechanical mulching for exotic eradication will be conducted under the supervision of a Gopher Tortoise Agent. Agent must be onsite during all mechanical mulching activities to ensure designated contractor adheres to best management practices to avoid impact to surrounding natural beach dune vegetation.*
- Contractor is responsible for preparing and obtaining required permit applications prior to starting work; PBSO will assist and pay for permit fees and submit applications for the following:
 - Vehicle on Beach Permits (one for each piece of equipment)
 - CCSL Permit
 - *Sea Turtle Permit (if performed during Sea Turtle Nesting Season)
- *Shorebird Monitoring required (if performed during Shorebird Monitoring Season)
- Contractor will be provided with most recent Gopher Tortoise survey

Task 1 Scaevola Removal/Eradication

Task 1 Option 1 Scaevola Hand Removal

Cost Estimate: \$250,000.00

Contractor will conduct one (1) exotic vegetation removal event within the ±2.0AC of designated Scaevola Hand Removal Areas (see map). All vegetation will be cut and stump treated with an appropriate herbicide. All horticultural debris from this task will be removed from the beach dune native vegetation area and properly disposed. This task will be supervised by an FDACS licensed project manager with certifications for Natural Areas Pesticide Applicators and Aquatic Herbicide Applicators. When exotic vegetation is removed, but the base of the vegetation remains, the base shall be treated with a US EPA approved herbicide and a visual tracer dye shall be applied.

Task 1 - Option 2 - Scaevola Eradication (Combo Chip-in-Place & Hand Removal) Cost Estimate: \$175,000.00

Contractor will conduct one (1) exotic eradication event within the ±2.0AC of designated Scaevola Areas (see map). All vegetation will be cut and stump treated with an appropriate herbicide. Horticultural debris will be chipped back into the beach dune native vegetation area. Mulch layers will not exceed 2" depth throughout any portion of the designated Scaevola Areas. This task will be supervised by an FDACS licensed project manager with certifications for Natural Areas Pesticide Applicators and Aquatic Herbicide Applicators. When exotic vegetation is cut, and the base of the vegetation remains, the base shall be treated with a US EPA approved herbicide and a visual tracer dye shall be applied. *The use of mechanical mulching for exotic eradication will be conducted under the supervision of a Gopher Tortoise Agent. GTA must be onsite during all mechanical mulching activities to ensure designated contractor adheres to best management practices to avoid impact to surrounding natural beach dune vegetation.*

Task 1 - Option 3 - Scaevola Mechanical Eradication

Cost Estimate: \$100,000.00

Contractor will conduct one (1) mechanical exotic eradication event within the ±2.0AC of designated Scaevola Areas (see map). A low ground pressure and rubber posi-track machine will be utilized to mechanically mow and mulch scaevola. Mechanical work will be conducted only during times of dry soil conditions to minimize ground disturbance. Mechanical management will be conducted in a manner that maintains the integrity of the overall beach dune community. *The use of mechanical mulching for exotic eradication will be conducted under the supervision of a Gopher Tortoise Agent. GTA must be onsite during all mechanical mulching activities to ensure designated contractor adheres to best management practices to avoid impact to surrounding natural beach dune vegetation.*

Task 2 - Follow-up Herbicide Treatment

Cost Estimate: \$10,000.00

30-45 days after the initial Scaevola eradication, the contractor will perform an herbicide treatment within the ±2.0AC of designated Scaevola Areas (see map). Any new growth of Scaevola will be cut and stump treated or foliar treated with a US EPA approved herbicide and a visual tracer dye. This task will be supervised by an FDACS licensed project manager with certifications for Natural Areas Pesticide Applicators and Aquatic Herbicide Applicators. This task will be performed prior to any supplemental beach dune plantings.

Task 3 - Supplemental Beach Dune Plantings

Cost Estimate: \$70,000.00

Contractor will supply and install plant material indicated below within the ±2.0AC Scaevola Area (see map). Plants will be installed in clusters to mimic the natural surroundings. Average spacing for dune plantings will be 2FT centers. At the time of installation all plant material will be initially watered and supplemented with crystalized hydrogel. *It is estimated that approximately ±22,000 units will be installed. Quantities are based on 85% coverage of 4" liners of sea oats, 5% coverage of 4" liners of dune sunflowers, 5% coverage of beach elder and 5% coverage of 4" liners of sea purslane.*

Task 4 - Year 1 - Ongoing Maintenance

Cost Estimate: \$15,000.00

Contractor will perform four (4) quarterly herbicide treatments within the ±2.0AC Scaevola Area (see map). This task will consist of selective cutting and spot treatments of new growth Scaevola or any other FLEPPC category I & II exotic vegetation. Maintenance events will be conducted in a manor to ensure that all newly planted vegetation is not damaged during these activities. This task will be supervised by an FDACS licensed project manager with certifications for Natural Areas Pesticide Applicators and Aquatic Herbicide Applicators.

Task 4 - Year 2 - Ongoing Maintenance

Cost Estimate: \$15,000.00

Contractor will perform four (4) quarterly herbicide treatments within the ±2.0AC Scaevola Area (see map). This task will consist of selective cutting and spot treatments of new growth Scaevola or any other FLEPPC category I & II exotic vegetation. Maintenance events will be conducted in a manor to ensure that all newly planted vegetation is not damage during these activities. This task will be supervised by an FDACS licensed project manager with certifications for Natural Areas Pesticide Applicators and Aquatic Herbicide Applicators.

Total estimated cost range is \$210,000 to \$360,000 depending upon contractor's means and methods.

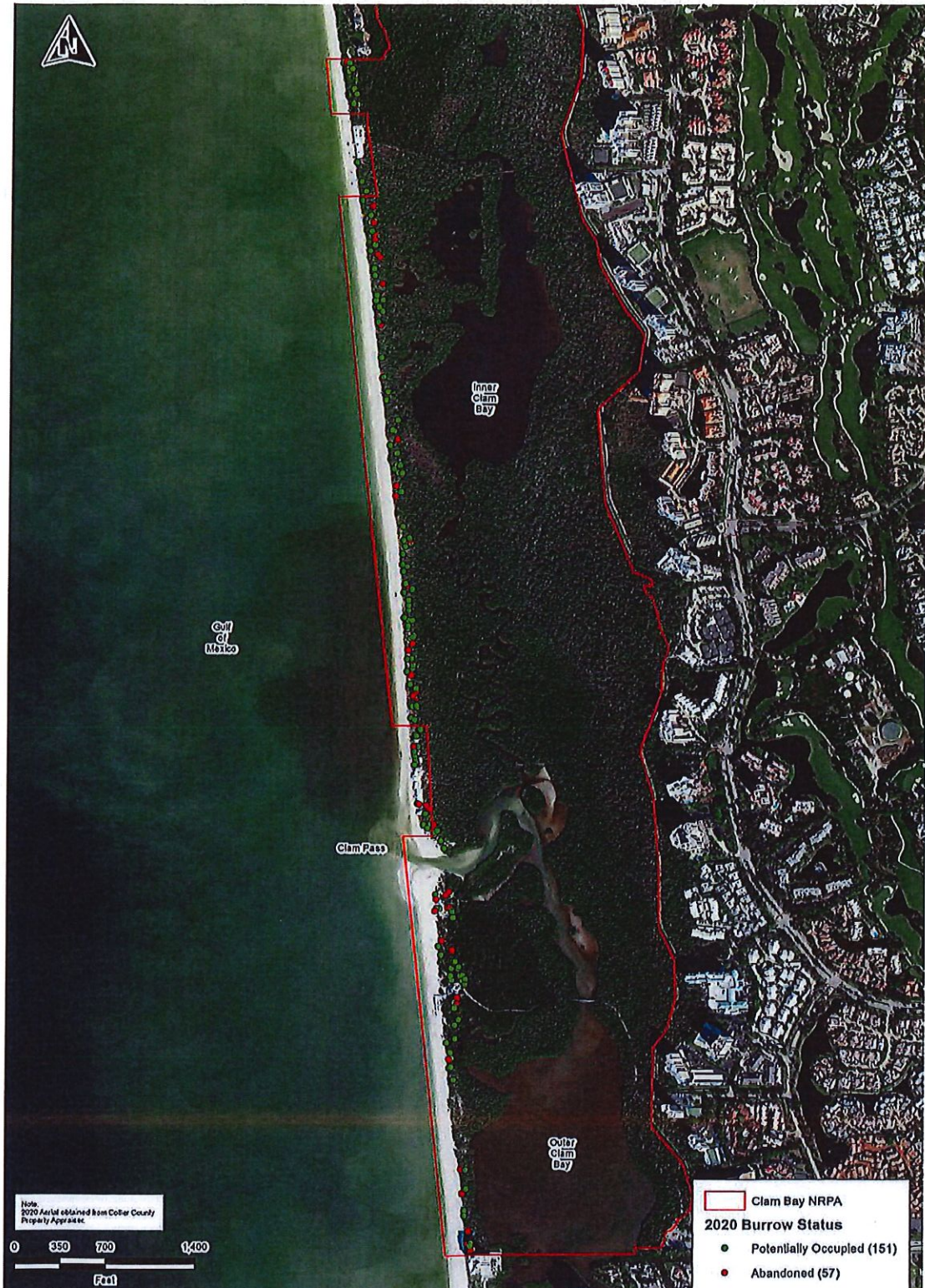


FIGURE 14. 2020 Gopher Tortoise Survey

8.2.1 Beach Naupaka (*Scaevola taccada*)

Based on mapping conducted in November 2020, approximately 1.11 acres of beach naupaka were identified along/within the dunes from Clam Pass to the Strand. Figure 18 details the areas identified. Beach naupaka is a Category I invasive exotic which has the ability to alter native plant communities, form dense monoculture areas, and create undesirable habitat for gopher tortoise. Management of beach naupaka is difficult as hand pulling can result in re-sprouting if not completely removed. Access for hauling away removed plant material is an added challenge. Maintenance for beach naupaka is tentatively planned for early 2021.



FIGURE 18. 2020 *Scaevola* Areas Map

DRAFT

FY 22 Clam Bay Budget

Current contracts and estimated costs

\$70,750 ¹	ETE	Clam Bay monitoring and annual report
33,600 ²	THA	Water quality monitoring and quarterly and annual reports
9,000	H&M	Monthly tidal analysis reports and aerial photos of Clam Pass
10,000	H&M	Annual bathymetric & tidal analysis report
14,000 ³	H&M	Annual bathymetric survey
25,000 ⁴	County Lab	Water quality sample collection, and analysis, and WIN entry
40,000	ETE	Hand-dug channel maintenance
80,000	Aquagenix	Exotic treatment
TBD		Scaevola treatment
1700	Verizon	Transmittal of data from tidal gauges
720	Locher	Web hosting for tidal gauges
5000		Equipment repair
	TBD	Reserves for contingencies
	TBD	Tax collector fees
	TBD	Property appraiser fees

n.b. \$150,000 available in County's 111 Fund
 FY20 fund balance will be available about March 31, 2020
 FY21 fund balance needs to be estimated before FY21 assessment is established

¹ Includes \$14,000 for T&M

² Includes \$8200 for T&M; **recommend reducing from 4 quarterly reports and 1 annual report to one 6-month and one annual report.**

³ Includes two bathymetric surveys per year; **recommend increasing bathymetric surveys from one to two per year.**

⁴ Includes \$14,000 for Clam Bay; \$8000 for berm sites; and \$3000 for WIN entry; **recommend reducing parameters for berm sites.**

Table 6a. Shoreline Change R-17 thru R-41 (Vanderbilt, Pelican Bay, North Clam Pass)

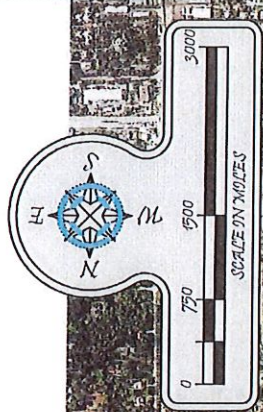
DEP Mon.	Design Standard (Ft)	Beach Width from Baseline (Ft)					Shoreline Change (Ft)			
		11/2005	6/2006	1/2017	3/2020	1/2021	2005 to 1/2021	2006 to 1/2021	1/2017 to 1/2021	3/2020 to 1/2021
Wiggins Pass										
R-17	-	51	77	17	-95	-93	-144	-170	-110	2
R-18	-	97	108	46	90	80	-17	-28	34	-10
R-19	-	111	99	77	136	126	15	27	49	-10
R-20	-	98	104	67	79	80	-18	-24	13	1
R-21	-	88	103	69	79	77	-11	-26	9	-2
R-22	100	106	106	103	109	109	3	3	6	0
R-23	100	100	121	105	112	115	15	-6	10	3
R-24	100	114	130	117	124	112	-2	-18	-5	-12
R-25	100	94	135	116	114	108	14	-27	-8	-6
R-26	100	109	148	133	117	116	7	-32	-17	-1
R-27	100	79	121	115	99	93	14	-28	-22	-6
R-28	100	96	138	119	105	89	-7	-49	-30	-16
R-29	100	86	144	119	110	103	17	-41	-16	-7
R-30	100	109	142	116	114	112	3	-30	-4	-2
R-31	100	109	132	125	123	111	2	-21	-14	-12
R-32	100	107	138	118	122	107	0	-31	-11	-15
R-33	100	90	103	105	90	90	0	-13	-15	0
R-34	100	80	103	95	101	80	0	-23	-15	-21
R-35	100	79	103	89	85	78	-1	-25	-11	-7
R-36	100	81	96	87	80	68	-13	-28	-19	-12
R-37	100	99	92	96	98	83	-16	-9	-13	-15
R-38	-	106	87	110	111	84	-22	-3	-26	-27
R-39	-	97	93	111	84	96	-1	3	-15	12
R-40	-	71	80	93	73	59	-12	-21	-34	-14
R-41	-	104	108	141	75	178	74	70	37	103
Clam Pass										
Reach	Average Beach Width (Ft)					Average Shoreline Change (Ft)				
Delnor-Wiggins R-17 to R-21	89	98	55	58	54	-35	-44	-1	-4	
Vanderbilt Beach R-22 to R-30.8	99	132	116	112	106	7	-25	-9	-5	
Pelican Bay Beach R-30.8 to R-37	92	110	102	100	88	-4	-21	-14	-12	
N. of Clam Pass R-38 to R-41	94	92	114	86	104	10	12	-9	19	
Monitoring Area R-17 to R-41	94	112	99	93	90	-4	-22	-9	-3	

Shaded portion of chart represents 2005/2006 project area.

Table 2b. Collier County Beach Nourishment History (R-17 to R-84 for 2005 thru 2020)

Date	Project	Project Type	Sand Placement	Volume (CY)
2005	Gulf Beach Restoration	Graded Beach	R-17 to R-20	157,500
2006	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	53,600
2007	Clam Pass Dredging	Inlet Dredge	R-42 to R-43.5	20,600
2009	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	32,500
2010	Naples Beach - Emergency Truck Haul	Truck Haul	R-30 to R-31	12,000
2011	Park Shore Beach - Emergency Truck Haul	Truck Haul	R-38 to R-40	10,000
2011	Naples Beach - Emergency Truck Haul	Truck Haul	R-30 to R-31	12,000
2011	Vanderbilt Beach - Emergency Truck Haul	Truck Haul	R-31 to R-32	10,000
2012	Naples Beach - Emergency Truck Haul	Truck Haul	R-31 to R-32	12,000
2013	Clam Pass Dredging	Inlet Dredge	R-40 to Inlet	10,400
2013	Clam Pass Dredging	Inlet Dredge	Inlet to R-44	9,600
2013	Doctors Pass Dredging	Inlet Dredge	Inlet to R-43	10,000
2016	Vanderbilt Beach	Truck Haul	R-31 to R-32	10,000
2016	Pelican Bay	Truck Haul	R-37 to R-38	22,000
2016	Park Shore (Segmented Fill Template)	Truck Haul	R-38 to R-39	10,000
2016	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-39	60,000
2016	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-38	60,000
2016	Clam Pass Dredging	Inlet Dredge	R-42 to R-43.5	14,300
2017	Vanderbilt Beach	Truck Haul	R-31 to R-32	10,000
2017	Pelican Bay	Truck Haul	R-37 to R-38	22,000
2017	Park Shore (Segmented Fill Template)	Truck Haul	R-38 to R-39	10,000
2017	Clam Pass Dredging	Inlet Dredge	R-40.5 to Inlet	3,000
2017	Clam Pass Dredging	Inlet Dredge	Inlet to R-43	2,400
2018	Clam Pass Dredging	Inlet Dredge	R-42 to R-43	8,500
2018	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	Jetty to R-58.5	5,800
2018	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	25,000
2018	Clam Pass	Truck Haul	R-42 to R-43	10,000
2018	Park Shore	Truck Haul	R-38 to R-39	10,000
2018	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-39	60,000
2020	Clam Pass Dredging	Inlet Dredge	R-40 to R-41	3,900
Total Volumes (Cubic Yards)				
Beach Placement Volume Collier Beach Project Area (Nearshore Disposal)				116,900
Beach Placement in the South Beach Project Area (Truck Haul)				104,680
Beach Placement in the Collier Beach Project Area (Truck Haul)				15,300
Nearshore Disposal Doctors Pass Dredging (Jetty to R-62):				116,900
Delnor-Wiggins - Beach & Nearshore Disposal within Monitoring Area (North of Project):				104,680
Total Project Area Sand Placement:				1,470,000
Total Monitoring Area Sand Placement:				1,820,000

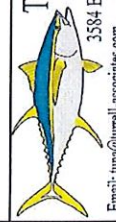
The volumes in cubic yards (CY) have been rounded for clarity.



MANATEE SIGN LEGEND	
NUMBER	SIGN
①	IDLE SPEED / NO WAKE WITHIN 500' OF LAUNCH
②	SLOW SPEED / MINIMUM WAKE
③	IDLE SPEED / NO WAKE
④	IDLE SPEED / NO WAKE
⑤	SLOW SPEED / MINIMUM WAKE OR INFORMATION SIGN



Putting signs 2, 3, & 4 on the three bridges near where these signs are shown and putting signs 1 & 5 in the locations shown appeared to be agreeable to PBS&D & CZM representatives at the meeting on Oct 20, 2020.



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CLAM BAY

SPEED ZONES AND SIGNAGE LOCATIONS

DESIGNED:	TH	DATE	SCALE	PROJECT
DRAWN BY:	RAU	-	-	-
CREATED:	02-18-14	-	-	-
JOB NO.:	9845	-	-	-
SHEET NO.:	07	-	-	-

SECTION- 09/09 TOWNSHIP- 49S RANGE- 25E