DATE: 11/27/07

ORM ACTION TRACKING SHEET (OATS)

APPLICATION NUMBER:	ACTION ID NUMBER: SWG-2007-1847	PROJECT MANAGER: Kimmel

APPLICATION RECEIVED: 10/30/07	APPLICATION COMPLETE: 10/30/07
APPLICANT/VIOLATOR INFORMATION: Applicant/Violator Name: City of Port Aransas	AGENT/CONTRACTOR INFORMATION: Agent/Contractor Name: Shiner Moseley & Associates
Address: 710 West Avenue A	Address: 555 N. Carancahua, Suite 1650
City, State, Zip: Port Aransas, TX 78373	City, State, Zip: Corpus Christi, TX 78478-0010
Work Phone: 361-749-4111	Work Phone: 361-857-2211
Home Phone:	Home Phone:

WORK SITE INFORMATION:

Waterway: Gulf of Mexico			County/City/State: Nueces/Port Aransas/Texas			
Area Office:	Authority:	10	404	X 10/404	9	103

PUBLIC NOTICE/COORDINATION LETTER INFORMATION:

Send Notice To:	Zone:	1	2	X 3	X 4	X 5

Mayor/City Manager: City of Port Aransas, TX	Postmaster: Port Aransas, TX
U.S. Park Service:	County Judge: Nueces County, TX
Adjacent Property Owners:	Navigation District:

PUBLIC NOTICE/COORDINATION LETTER INFORMATION (CONTINUED):

Issued:	_______ 30 Days
Extended:	_______ 15 Days
Ended:	

FINAL ACTION INFORMATION:

EA/SOF/404(B) (1):				Draft Permit Forwarded:		
Application Denied:				Permit Issued:		
Permit Expiration Date:				Fee:		
Application Withdrawn:				Mitigation:	Yes	No
Type of Action:	IP	LP	GP	NW	Mod	Transfer
	Desk Juris		Field Juris		No Permit Required	

UNAUTHORIZED ACTIVITY RESOLUTIONS:

After-the-Fact Issued:	Violation Restored:	Litigation:
After-the-Fact Penalty:	Case Closed:	

NON-COMPLIANCE RESOLUTIONS:

Mod: Vol. Rest.: Litigation: Penalty: Minor:

401 Cert.:	CZM:	Railroad Cert:
Related Action ID's:		

HDR | **SHINER MOSELEY AND ASSOCIATES, INC.**

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October 26, 2007 66107

Mr. Lloyd Mullins
Unit Leader
U.S. Army Corps of Engineers
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411

RE: CITY OF PORT ARANSAS-USACE PERMIT APPLICATION FOR BEACH MAINTENANCE ACTIVITES, PORT ARANSAS, NUECES COUNTY, TEXAS

Dear Mr. Mullins:

HDR|Shiner Moseley and Associates, Inc. has been engaged by the City of Port Aransas to obtain the necessary authorizations to conduct beach maintenance activities along an approximate 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits north to Lantana Drive (See Permit Drawings Sheet 1 of 8). Enclosed for your consideration are a completed permit application with drawings (Enclosure 1) and a completed CMP form (Enclosure 2).

I. PROJECT LOCATION

The proposed project is located along the Gulf of Mexico on an approximate 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits (located near the La Mirage Condominiums) north to Lantana Drive (See Permit Drawings Sheet 1 of 8). The project can be located on U.S.G.S. quadrangle maps entitled "Port Aransas". The approximate UTM coordinates at the northern limit (Lantana Drive) are: UTM Zone 14 691745E 3079488N (NAD27). The approximate coordinates at the southern limit (City of Port Aransas City limit) are UTM Zone 14 686747E 3072773N (NAD27).

II PROJECT PURPOSE AND NEED

The purpose of this application is to gain authorization for beach maintenance activities associated with the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, cans etc.) from the public beach and to preserve public vehicular access to the beach.

III. PROJECT DESCRIPTION

The City of Port Aransas actively cleans approximately 7 miles of contiguous beach within its jurisdiction that extends from the southern end of the Port Aransas City limits north to Lantana

HDR Engineering, Inc. | 555 N Carancahua Suite 1650 Corpus Christi, TX 78478-0010 | Phone (361) 857-2211 Fax (361) 857-7234 www.hdrinc.com

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Drive. The City's Public Works Department is responsible for beach maintenance and cleaning and maintenance of the City's sanitation, roads, and rights of way.

A. Criteria for Beach Cleaning Selection

The Public Works Director determines when the beaches are cleaned and when the vehicular travel way needs maintenance. The City has a three-tiered priority system to determine which areas of the 7 mile stretch of beach will be cleaned and in what order. Locations of beach maintenance priority areas A-C are included in Permit Drawings Sheet 2 of 8. Descriptions of each beach maintenance priority area are as follows:

- **Priority Area A** - High use areas including those portions of beach located between Lantana Drive south to Beach Access Road 1A. Priority A areas are cleaned and maintained daily first in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day.

- **Priority Area B** - Semi-heavily used areas including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

- **Priority Area C** - Low use areas including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas City limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower. Ground trash is handpicked from Priority C areas every day.

B. Survey to Determine Annual High Tide Line (HTL) and the Mean Tide Line (MTL)

In order to determine the approximate location of HTL and MTL, 6 cross-sectional surveys were conducted within the City's 7 mile jurisdiction (See Permit Drawings Sheet 1 of 8). The survey was conducted on June 4, 2007 and results are included in Permit Drawings Sheets 3 of 8 through 5 of 8. HTL was observed by HDR/Shiner Moseley survey personnel and MTL was based on Port Aransas and Bob Hall Pier tide gauge data.

C. Beach Maintenance Practices

Beach maintenance practices are typically used seasonally (April-August), but there is always the occasion that these practices can be used at other times in the year.

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For example, sargassum beach cleaning practices have been used in October for cleaning up tropical storm and hurricane storm debris that washed ashore piles of vegetative material. Beach maintenance on the roadway can occur at any time, during damaging high water events. Current beach maintenance practices performed by the City of Port Aransas in Priority Areas A, B, and C include:

1. Removal of all non-natural material such as lumber, plastic bottles, cans etc. from the beach to an off-site municipal sanitary landfill. This beach maintenance practice is typically utilized year round;

2. Movement of sand from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and MTL (See Permit Drawings Sheet 6 of 8). This activity can be described as beach grooming and is conducted to preserve the aesthetics of the beach. This activity is conducted seasonally but can be conducted during other times of the year if necessary;

3. Repositioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance (See Permit Drawings Sheet 6 of 8). This activity is conducted year-round; mainly during times of drought when the upper reaches of the beach are extremely dried out.

4. Re-location of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL (See Permit Drawings Sheet 7 of 8 and Sheet 8 of 8). The Texas General Land Office (TGLO) "The Texas General Land Office (TGLO) provides oversight for activities..." located within the foredune area. Once the sargassum material degrades, it is subsequently removed from the TGLO beach maintenance storage areas and placed in the surf just below MTL. The sand and sargassum is then allowed to re-distribute naturally along the shoreline. This activity is conducted seasonally but can be conducted during other times of the year if necessary. Sargassum material can be placed in three locations within the TGLO beach maintenance storage area:

   a. Front-stacking of small piles consisting of sand/sargassum above HTL at base of the foredune in accreting beaches only.

   b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.

   c. Back-stacking of small piles consisting of sand/sargassum in back of the main dune line on all beaches.

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5. Relocation of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into windrows both above and below MTL (See Permit Drawings Sheet 7 of 8). A motor grader is used to dig a trench and the sargassum windrow is then pushed into the trench and buried. This activity is conducted seasonally but can be conducted during other times of the year if necessary.

6. Conduct leveling of the beach, sand placement, and sargassum collection below MTL. This activity is conducted seasonally but can be conducted during other times of the year if necessary.

A cost evaluation and practicality review were conducted for alternative material placement options. Alternatives reviewed included landfilling, composting etc. These methods were deemed not to be physically, environmentally, or financially feasible.

D. Type of Equipment Utilized on each Stretch of Beach

Beach maintenance equipment is typically used seasonally (April-August), but there is always the occasion that the equipment can be used at other times in the year if necessary. The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August).

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C

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- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to an approved upland location.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment** - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

- **Skid-O-Can Pumper Trucks** – This piece of equipment is utilized to remove wastes from skid-o-cans located in Areas A, B, and C.

E. Beach Maintenance Staff

The City of Port Aransas has the following Public Works Staff assigned to beach maintenance:

- **4 Full-time Heavy Equipment Operators** - Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; Primarily responsible for removal of sargassum and roadway maintenance.

- **2 Supervisors** - Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff. Also can be responsible for running all heavy equipment such as front-end loaders, tractors, and motor.

- **6 Full-time Ground Custodians** – Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.

- **1 Skid-O-Kan Operator -** Responsible for maintaining skid-o-kans located on the beach. This includes the removal of waste via a waste pumping truck that is driven to each skid-o-kan location.

IV. ENDANGERED SPECIES

A. Sea Turtles

The City of Port Aransas has no plans to contract with independent turtle patrols on their 7 miles of maintained beach. Instead, the City will continue to work in conjunction with existing turtle patrols conducted by representatives from the University of Texas Marine Science Institute (UTMSI). UTMSI conducts volunteer turtle patrols daily from April 1 to mid-July. These patrols are conducted during the daylight hours, from approximately 6:30 am until 6 pm from the Mustang Island State Park north to the northern Port Aransas City limits.

The City of Port Aransas will conduct, in addition to the above mentioned turtle patrols, their own patrols during the work day, looking for both turtles and signs of turtle nesting. A Public Works representative will drive each stretch of beach prior to cleaning to look for turtles and turtle nests. If a turtle is located, a City Public Works representative will immediately report the siting to either Tony Amos with the UTMSI ARK program or Donna Shaver with the Padre Island National Seashore (PINS). Beach cleaning activities at a turtle siting location will cease until a scientific permit holder arrives on-site to recover the turtle and its' nest.

In March 2008, the City will enroll Public Works staff in a formal turtle patrol training class with a representative of PINS. A refresher course will be provided to Public Works staff every year prior to turtle nesting season. New employees who are hired on after turtle nesting season will be given a hand-out regarding turtles and will be required to take the training class during March of the following year.

B. Piping Plover

Despite minor disturbance from beach maintenance activities, piping plovers have continued to forage on wet beach areas. Clearing of sargassum and other debris from the beach may provide the piping plover with more surface area for foraging, since they prefer to feed on unvegetated areas.

The general length of time the plovers' foraging habitats are indirectly disrupted by maintenance activities (i.e. noise from heavy machinery) in any one priority area ranges from a few hours to approximately 3-4 days, depending upon the amount of

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sargassum and debris to be removed. For example, in Priority Area A it can take up to 3-4 days to clean after a heavy sargassum event or during heavy pedestrian/vehicle usage. It should be noted that heavy machinery does not remain in a static location within a priority area for more than a short period and is moving down the beach as cleaning is taking place. Piping plovers are temporarily affected by the noise from machinery and can move to an immediately adjacent section of beach during beach maintenance activities.

V. REQUESTED ACTION

HDR|Shiner Moseley respectfully requests that your office review and process this permit application as expeditiously as practicable. If you have any questions or require additional information, please contact me at 361-857-2211.

Sincerely,

HDR ENGINEERING, INC.

Chemaine Sahadi Koester

Chemaine Sahadi Koester, REM
Environmental Biologist

CSK/ljf

Enclosures: 1. Permit Application with Drawings
2. CMP Form

cc: Michael Kovacs, City Manager, City of Port Aransas
David Parsons, City Planner, City of Port Aransas

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT *(33 CFR 325)*	OMB APPROVAL NO. 0710-0003 Expires December 31, 2004

PRIVACY STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies. Submission of requested information is voluntary, however, if information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
		OCT 30 2007	

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME City of Port Aransas	8. AUTHORIZED AGENT'S NAME AND TITLE *(an agent is not required)* HDR|Shiner Moseley; Contact: Chemaine Sahadi Koester, REM
6. APPLICANT'S ADDRESS 710 West Avenue A Port Aransas, Texas 78373	9. AGENT'S ADDRESS 555 N. Carancahua Street, Suite 1650 Corpus Christi, Texas 78478-2211
7. APPLICANT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business 361-749-4111	10. AGENT'S PHONE NUMBERS WITH AREA CODE a. Residence b. Business 361-857-2211

11. **STATEMENT OF AUTHORIZATION**

I hereby authorize HDR|Shiner Moseley to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE

10/29/07
DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE *(see instructions)*
City of Port Aransas Beach Maintenance

13. NAME OF WATERBODY, IF KNOWN *(if applicable)* Gulf of Mexico	14. PROJECT STREET ADDRESS *(if applicable)* N/A
15. LOCATION OF PROJECT Nueces (COUNTY) Tx (STATE)	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN *(see instructions)*

N/A

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17. DIRECTIONS TO THE SITE

From Corpus Christi, take SH 368 over the JFK Causeway. Turn north (left) onto SH 361 towards Port Aransas, Texas. Turn east onto Beach Access Road 1A to the beach. Beach maintenance activities extend from the southern Port Aransas city limits (near the La Mirage Condominiums) north 7 miles to Lantana Drive.

18. Nature of Activity *(Description of project, include all features)*

1. Removal of all non-natural material such as lumber, plastic bottles, cans, etc. from the beach to an off-site sanitary landfill
2. Movement of sand from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and the mean high tide line (MTL). This activity can be described as beach grooming and is conducted to preserve the aesthetics of the beach.
3. Re-positioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance.
4. Re-positioning of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL. The Texas General Land Office (TGLO) issues leases and easements for structures and activities located in the foredune area. Once the sargassum material degrades, it is subsequently removed from TGLO beach maintenance storage areas and placed in the surf just below MTL. The sand and degraded sargassum is allowed to redistribute naturally along the shoreline. Sargassum can be placed in three locations within the TGLO beach maintenance storage area:
   a. Front -stacking of small piles consisting of sand/sargassum above HTL at the base of the foredune on accreting beaches only.
   b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.
   c. Back-stacking of small piles consisting of sand/sargassum in back of the main dune line on all beaches.
5. Conduct leveling of the beach, sand placement, and sargassum collection below MTL.

19. Project Purpose *(Describe the reason of purpose of the project, see instructions)*

The purpose of this application is to authorize beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, cans etc.) from the public beach.

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Beach maintenance activities associated with removal of sargassum from portions of the beach and the re-location of sand for beach grooming.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Approximately 22,800 cy of sand and sargassum could potentially be re-located over 7 miles of beach between the southern Port Aransas city limits and Lantana Rd.

22. Surface Area in Acres of Wetlands or Other Waters Filled *(see instructions)*

Approximately 170 acres of waters of the U.S. and wetlands over 7 miles of beach between the southern Port Aransas city limits and Lantana Rd.

23. Is Any Portion of the Work Already Complete? Yes ☒ No ☐ IF YES, DESCRIBE THE COMPLETED WORK

Beach maintenance is an on-going operation.

24. Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

Texas General Land Office; 1700 N. Congress Avenue, Austin, Texas

25. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application

AGENCY	TYPE APPROVAL *	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building and flood plain permits

26. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
		Charmaine Koester	10/29/07

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a materiel fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

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The applicant should sign this statement and return to:

U.S. Army Corps of Engineers (USACE)
Regulatory Branch
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411
Fax: 361-814-5912

USACE Permit Number SWG-2007-1847 (To be assigned by USACE)

Applicant's Name and Address (please print):
City of Port Aransas
710 West Avenue A
Port Aransas, Texas 78373

Agent's Name and Address (if applicable):
HDR|Shiner Moseley;
Contact: Chemaine Koester
555 N. Carancahua Street, Suite1650
Corpus Christi, Texas 78478-2211

Project Manager or Regulatory Specialist (if known):

____

The proposed activity complies with the enforceable policies of the Texas Coastal Management Program and will be conducted in a manner consistent with such policies.

Date: 10/29/07 Signature: Chemaine Koester
(authorized agent - HDR/Shiner Moseley)

Any questions regarding the Texas Coastal Management Program should be referred to:

Diane Garcia
Texas General Land Office
Coastal Coordination Council
1700 North Congress Avenue, Room 617
Austin, Texas 78701-1495
512-463-5385 512-475-0680 Fax
diane.garcia@glo.state.tx.us

NOTICE OF APPLICATION
INTERNAL USACE REVIEW
REGULATORY BRANCH, EVALUATION SECTION, SOUTH UNIT
STANDARD PERMIT

Your review of the proposed project plans is requested in order to ascertain a no affect/will affect decision in relation to USACE concerns. Please provide written or e-mailed comments, and any special conditions that would be needed if a permit is issued, to the POC by the comments-due date. Negative replies requested.

PERMIT NUMBER	Point of Contact (POC)	DATE NOTICE ISSUED	COMMENTS DUE BY *(5 WORKING DAYS)*:
SWG-2007-1847	**Matthew Kimmel 361-814-5847x127**	**7 Nov 2007**	**14 Nov 2007**

APPLICANT: City of Port Aransas
710 West Avenue A
Port Aransas, Texas 78373
Telephone: 361-749-4111
POC: Michael Kovacs

AGENT: Shiner Moseley and Associates, Inc.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478-0010
Telephone: 361-857-2211
POC: Chemaine Sahadi Koester

LOCATION: The project is located at Port Aransas Beach, from the southern city limits north to Lantana Drive. The project can be located on the U.S.G.S. quadrangle map entitled: PORT ARANSAS, Texas. Approximate UTM Coordinates in NAD 27 (meters): Zone 14; from Easting: 685,521; Northing: 3,070,683 to Easting: 691,676; Northing: 3,079,308.

PROJECT DESCRIPTION: The applicant proposes to conduct beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, etc.) from the public beach in the following manner:

1. Removal of all non-natural material such as lumber, plastic bottles, cans, etc. from the beach to an off-site sanitary landfill.
2. Movement of sand from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and the mean high tide line (MTL). This activity can be described as beach grooming and is conducted to preserve the aesthetics of the beach.
3. Re-positioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance.
4. Re-positioning of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL. The Texas General Land Office (TGLO) issues leases and easements for structures and activities located in the foredune area. Once the sargassum material degrades, it is subsequently removed from TGLO beach maintenance storage areas and placed in the surf just below MTL. The sand and degraded sargassum is allowed to redistribute naturally along the shoreline. Sargassum can be placed in three locations within the TGLO beach maintenance storage area.
   a. Front-stacking of small piles consisting of sand/sargassum above HTL at the base of the foredune on accreting beaches only.
   b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.
   c. Back-stacking of small piles consisting of sand /sargassum in back of the main dune line on all beaches.
5. Conducting leveling of the beach, sand placement, and sargassum collection below MTL.

The applicant's plans are enclosed in 8 sheets.

FOR STAFF ARCHAEOLOGIST:	☒**Ms. Nikki Minnichbach** ☐**Mr. Jerry Androy**		**Date Reviewed:**	**11/14/07**				
1. Known Properties:				**in the permit area** **in the immediate vicinity/similar topographic.**				
2. Recommended Action:	**No Action** ☒		**Survey/Assessment** ☐	**Avoidance** ☐				
3. SHPO Coordination:	**YES** ☐		**NO** ☒					
4. Public Notice Statement:	**A**☒	**B**☐	**C**☐	**D**☐	**E**☐	**F**☐	**G**☐	**H**☐ **(See Notes)**

STAFF ARCHAEOLOGISTS NOTES:

USACE COMMENTS OR CONCERNS:

Copies Furnished:

ARCHAEOLOGY REVIEW:

CESWG-PE-E
NICOLE MINNICHBACH
JERRY ANDROY

REAL ESTATE REVIEW:

CESWG-RE-A
SAL ARCIDIACONO
MARIA L. HENKEL

AREA OFFICE REVIEW:

CESWG-AO-N
DARRELL W. JOHNSON

CESWG-AO-S
RALPH RUBALCABA.

CESWG-AO-B

PROGRAMS & PROJECT MANAGEMENT DIVISION

CESWG-PPMD
ARTHUR J. JANECKA

OPERATIONS/NAVIGATION REVIEW:

CESWG-OD-N
RONNIE BARCAK
FRANK GARCIA
CYNTHIA BURKE
RHONDA BROWN

ENGINEERING DIVISION REVIEW:

CESWG-EC
DAVID B. CAMPBELL

PUBLIC AFFAIRS OFFICE REVIEW:

CESWG-PA
MARILYN URICH

Public Notice

U.S. Army Corps	Permit Application No:	SWG-2007-1847
Of Engineers	Date Issued:	27 November 2007
Galveston District	Comments Due:	27 December 2007

U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

PURPOSE OF PUBLIC NOTICE: To inform you of a proposal for work in which you might be interested. It is also to solicit your comments and information to better enable us to make a reasonable decision on factors affecting the public interest. We hope you will participate in this process.

AUTHORITY: This application will be reviewed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

APPLICANT:
City of Port Aransas
710 West Avenue A
Port Aransas, Texas 78373
Telephone: 361-749-4111
POC: Michael Kovacs

AGENT:
Shiner Moseley and Associates, Inc.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478-0010
Telephone: 361-857-2211
POC: Chemaine Sahadi Koester

LOCATION: The project is located along a 7 mile stretch of the Gulf of Mexico at Port Aransas Beach, within the City of Port Aransas. The project area begins at the southern city limits and extends north to Lantana Drive. The project can be located on the U.S.G.S. quadrangle map entitled: PORT ARANSAS, Texas. Approximate UTM Coordinates in NAD 27 (meters): Zone 14; from Easting: 685,521; Northing: 3,070,683 to Easting: 691,676; Northing: 3,079,308.

PROJECT DESCRIPTION: The applicant proposes to conduct beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, etc.) from the public beach in the following manner:

1. Removal of all non-natural material such as lumber, plastic bottles, cans, etc. from the beach to an off-site sanitary landfill.
2. Movement of sand from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and the mean high tide line (MTL). This activity can be described as beach grooming and is conducted to preserve the aesthetics of the beach.
3. Re-positioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance.
4. Re-positioning of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL. The Texas General Land Office (TGLO) issues leases and easements for structures and activities located in the foredune area. Once the sargassum material degrades, it is subsequently removed from TGLO beach maintenance storage areas and placed in the surf just below MTL. The sand and degraded sargassum is allowed to redistribute naturally along the shoreline. Sargassum can be placed in three locations within the TGLO beach maintenance storage area.
   a. Front-stacking of small piles consisting of sand/sargassum above HTL at the base of the foredune on accreting beaches only.
   b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.
   c. Back-stacking of small piles consisting of sand /sargassum in back of the main dune line on all beaches.
5. Conducting leveling of the beach, sand placement, and sargassum collection below MTL.

NOTES: This public notice is being issued based on information furnished by the applicant. This information has not been verified. The project plans, in 8 sheets, can be viewed in their entirety on http://www.swg.usace.army.mil/reg/pn.asp. Copies of the full plans may be requested by contacting the project manager listed on page 4 of this public notice.

A preliminary review of this application indicates that an Environmental Impact Statement (EIS) is not required. Since permit assessment is a continuing process, this preliminary determination of EIS requirement will be changed if data or information brought forth in the coordination process is of a significant nature.

Our evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404 (b)(1) of the Clean Water Act (CWA).

OTHER AGENCY AUTHORIZATIONS: Texas Coastal Zone consistency certification is required. The applicant has stated that the project is consistent with the Texas Coastal Management Program goals and policies and will be conducted in a manner consistent with said Program.

This project would result in a direct impact of greater than three acres of waters of the state or 1500 linear feet of streams (or a combination of the two is above the threshold), and as such would not fulfill Tier I criteria for the project. Therefore, Texas Commission on Environmental Quality (TCEQ) certification is required. Concurrent with U.S. Army Corps of Engineers (Corps) processing of this application, the TCEQ is reviewing this application under Section 401 of the CWA and in accordance with Title 30, Texas Administrative Code Section 279.1-13 to determine if the work would comply with State water quality standards. By virtue of an agreement between the Corps and the TCEQ, this public notice is also issued for the purpose of advising all known interested persons that there is pending before the TCEQ a decision on water quality certification under such act. Any comments concerning this application may be submitted to the Texas Commission on Environmental Quality, 401 Coordinator, MSC-150, P.O. Box 13087, Austin, Texas 78711-3087. The public comment period extends 30 days from the date of publication of this notice. A copy of the public notice with a description of work is made available for review in the TCEQ's Austin office. The complete application may be reviewed in the Corps office listed in this public notice. The TCEQ may conduct a public meeting to consider all comments concerning water quality if requested in writing. A request for a public meeting must contain the following information: the name, mailing address, application number, or other recognizable reference to the application; a brief description of the interest of the requester, or of persons represented by the requester; and a brief description of how the application, if granted, would adversely affect such interest.

NATIONAL REGISTER OF HISTORIC PLACES: The staff archaeologist has reviewed the latest published version of the National Register of Historic Places, lists of properties determined eligible, and other sources of information. The following is current knowledge of the presence or absence of historic properties and the effects of the undertaking upon these properties: The permit area has been so extensively modified that little likelihood exists for the proposed project to impinge upon a historic property, even if present within the affected area.

THREATENED AND ENDANGERED SPECIES: Threatened and/or endangered species or their critical habitat may be affected by the proposed work. Consultation with the U.S. Fish and Wildlife and/or the National Marine Fisheries Service will be initiated to assess the effect on endangered species.

ESSENTIAL FISH HABITAT: This notice initiates the Essential Fish Habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action would not have a substantial adverse impact on Essential Fish Habitat or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

PUBLIC INTEREST REVIEW FACTORS: This application will be reviewed in accordance with 33 CFR 320-330, the Regulatory Programs of the Corps of Engineers, and other pertinent laws, regulations and executive orders. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal, will be considered: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people.

SOLICITATION OF COMMENTS: The Corps of Engineers is soliciting comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Impact Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

This public notice is being distributed to all known interested persons in order to assist in developing facts upon which a decision by the Corps of Engineers may be based. For accuracy and completeness of the record, all data in support of or in opposition to the proposed work should be submitted in writing setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition.

PUBLIC HEARING: Prior to the close of the comment period any person may make a written request for a public hearing setting forth the particular reasons for the request. The District Engineer will determine whether the issues are substantial and should be considered in the permit decision. If a public hearing is warranted, all known interested persons will be notified of the time, date, and location.

CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before December 28, 2007. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. **If no comments are received by that date, it will be considered that there are no objections**. Comments and requests for additional information should be submitted to:

Matthew Kimmel
Regulatory Branch, CESWG-PE-RCC
U.S. Army Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411
361-814-5847 Phone
361-814-5912 Fax

DISTRICT ENGINEER
GALVESTON DISTRICT
CORPS OF ENGINEERS

Public Notice

U.S. Army Corps Of Engineers Galveston District

Permit Application No:	SWG-2007-1847
Date Issued:	30 November 2007
Comments Due:	31 December 2007

U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

PURPOSE OF PUBLIC NOTICE: To inform you of a proposal for work in which you might be interested. It is also to solicit your comments and information to better enable us to make a reasonable decision on factors affecting the public interest. We hope you will participate in this process.

AUTHORITY: This application will be reviewed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

APPLICANT: City of Port Aransas
710 West Avenue A
Port Aransas, Texas 78373-4128
Telephone: 361-749-4111; POC: Michael Kovacs

AGENT: Shiner Moseley and Associates, Inc.
555 North Carancahua Street, Suite 1650
Corpus Christi, Texas 78478-0010
Telephone: 361-857-2211; POC: Chemaine Sahadi Koester

LOCATION: The project is located along a 7-mile stretch of the Gulf of Mexico at Port Aransas Beach, within the City of Port Aransas, Nueces County, Texas. The project area begins at the southern city limits and extends north to Lantana Drive. The project can be located on the U.S.G.S. quadrangle map entitled: PORT ARANSAS, Texas. Approximate UTM Coordinates in NAD 27 (meters): Zone 14; from Easting: 685,521; Northing: 3,070,683 to Easting: 691,676; Northing: 3,079,308.

PROJECT DESCRIPTION: The applicant proposes to conduct beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, etc.) from the public beach in the following manner:

1. Removal of all non-natural material such as lumber, plastic bottles, cans, etc. from the beach to an off-site sanitary landfill.

2. Movement of sand from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and the mean high tide line (MTL). This activity can be described as beach grooming and is conducted to preserve the aesthetics of the beach.

3. Repositioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance.

4. Repositioning of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL. The Texas General Land Office (GLO) issues leases and easements for structures and activities located in the foredune area. Once the sargassum material degrades, it is subsequently removed from GLO beach maintenance storage areas and placed in the surf just below MTL. The sand and degraded sargassum is allowed to redistribute naturally along the shoreline. Sargassum can be placed in three locations within the GLO beach maintenance storage area:

a. Front-stacking of small piles consisting of sand/sargassum above HTL at the base of the foredune on accreting beaches only.
b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.
c. Back-stacking of small piles consisting of sand /sargassum in back of the main dune line on all beaches.

5. Conducting leveling of the beach, sand placement, and sargassum collection below MTL.

NOTES: This public notice is being issued based on information furnished by the applicant. This information has not been verified. The applicant's plans are enclosed in 8 sheets.

A preliminary review of this application indicates that an Environmental Impact Statement (EIS) is not required. Since permit assessment is a continuing process, this preliminary determination of EIS requirement will be changed if data or information brought forth in the coordination process is of a significant nature.

Our evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404 (b)(1) of the Clean Water Act (CWA).

OTHER AGENCY AUTHORIZATIONS: Texas Coastal Zone consistency certification is required. The applicant has stated that the project is consistent with the Texas Coastal Management Program goals and policies and will be conducted in a manner consistent with said program.

This project would result in a direct impact of greater than three acres of waters of the state or 1500 linear feet of streams (or a combination of the two is above the threshold), and as such would not fulfill Tier I criteria for the project. Therefore, Texas Commission on Environmental Quality (TCEQ) certification is required. Concurrent with U.S. Army Corps of Engineers (Corps) processing of this application, the TCEQ is reviewing this application under Section 401 of the CWA and in accordance with Title 30, Texas Administrative Code Section 279.1-13 to determine if the work would comply with State water quality standards. By virtue of an agreement between the Corps and the TCEQ, this public notice is also issued for the purpose of advising all known interested persons that there is pending before the TCEQ a decision on water quality certification under such act. Any comments concerning this application may be submitted to the Texas Commission on Environmental Quality, 401 Coordinator, MSC-150, P.O. Box 13087, Austin, Texas 78711-3087. The public comment period extends 30 days from the date of publication of this notice. A copy of the public notice with a description of work is made available for review in the TCEQ's Austin office. The complete application may be reviewed in the Corps office listed in this public notice. The TCEQ may conduct a public meeting to consider all comments concerning water quality if requested in writing. A request for a public meeting must contain the following information: the name, mailing address, application number, or other recognizable reference to the application; a brief description of the interest of the requester, or of persons represented by the requester; and a brief description of how the application, if granted, would adversely affect such interest.

NATIONAL REGISTER OF HISTORIC PLACES: The staff archaeologist has reviewed the latest published version of the National Register of Historic Places, lists of properties determined eligible, and other sources of information. The following is current knowledge of the presence or absence of historic properties and the effects of the undertaking upon these properties:

> The permit area has been so extensively modified that little likelihood exists for the proposed project to impinge upon a historic property, even if present within the affected area.

THREATENED AND ENDANGERED SPECIES: Threatened and/or endangered species or their critical habitat may be affected by the proposed work. Consultation with the U.S. Fish and Wildlife and/or the National Marine Fisheries Service will be initiated to assess the effect on endangered species.

ESSENTIAL FISH HABITAT: This notice initiates the Essential Fish Habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action would not have a substantial adverse impact on Essential Fish Habitat or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

PUBLIC INTEREST REVIEW FACTORS: This application will be reviewed in accordance with 33 CFR 320-330, the Regulatory Programs of the Corps, and other pertinent laws, regulations and executive orders. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal, will be considered: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people.

SOLICITATION OF COMMENTS: The Corps is soliciting comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Impact Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

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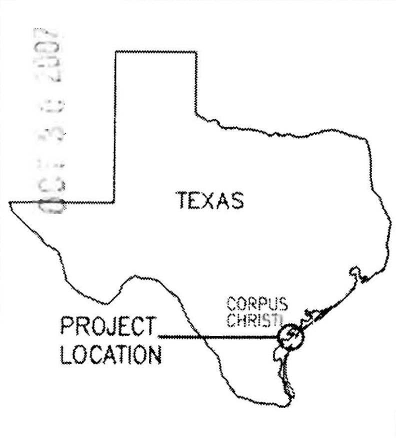
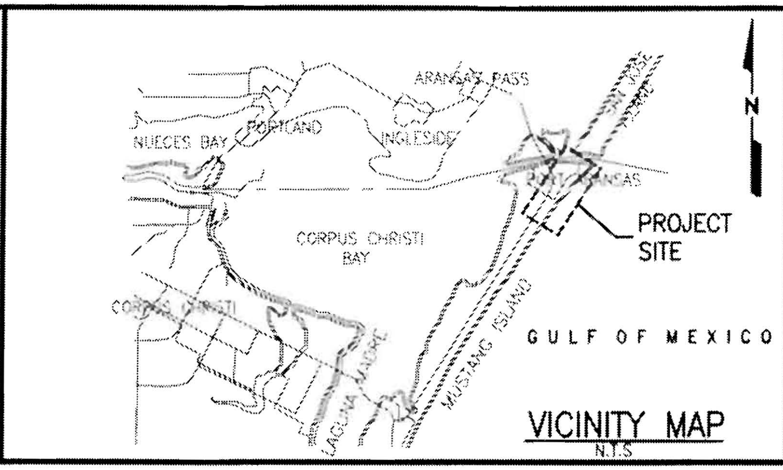
PUBLIC HEARING: Prior to the close of the comment period any person may make a written request for a public hearing setting forth the particular reasons for the request. The District Engineer will determine whether the issues are substantial and should be considered in the permit decision. If a public hearing is warranted, all known interested persons will be notified of the time, date, and location.

CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before **31 December 2007**. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. **If no comments are received by that date, it will be considered that there are no objections**. Comments and requests for additional information should be submitted to:

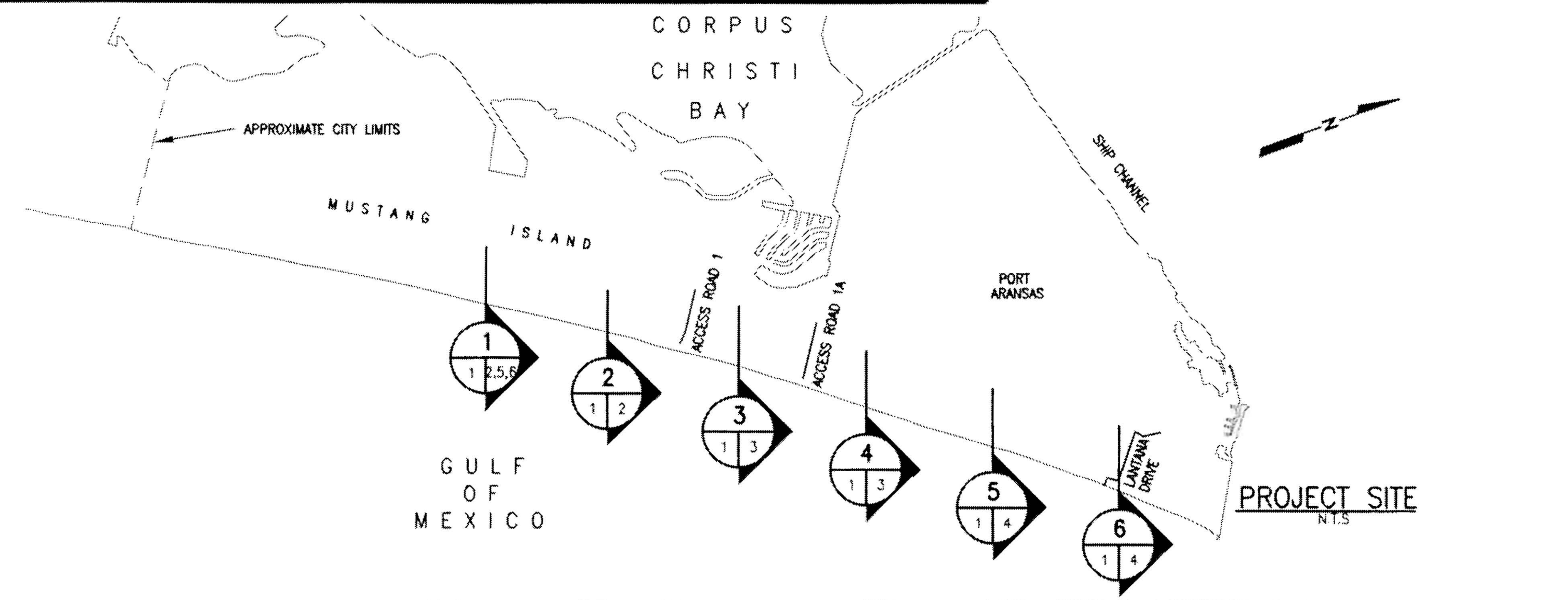
Matthew Kimmel
Regulatory Branch, CESWG-PE-RCC
U.S. Army Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318
361-814-5847 Phone
361-814-5912 Fax

DISTRICT ENGINEER
GALVESTON DISTRICT
CORPS OF ENGINEERS





PROJECT LOCATION



OCT 3 0 2007

FOR COE USE ONLY
Permit Application No.: SWG-2007-1897
Applicant Name: City of Port Aransas
Sheet 1 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107	SHEET 01 of 08

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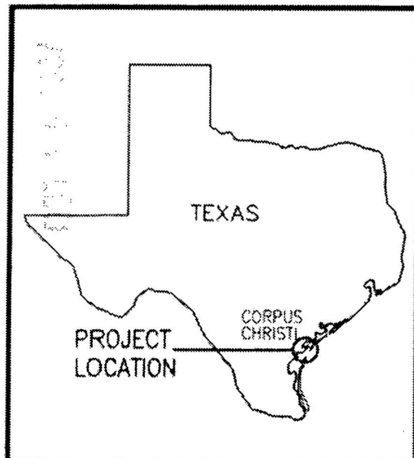
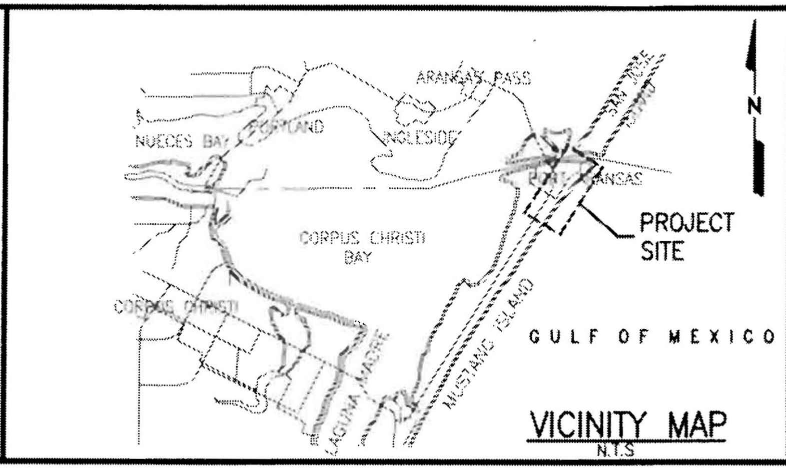
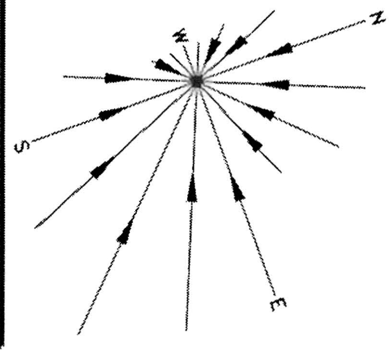
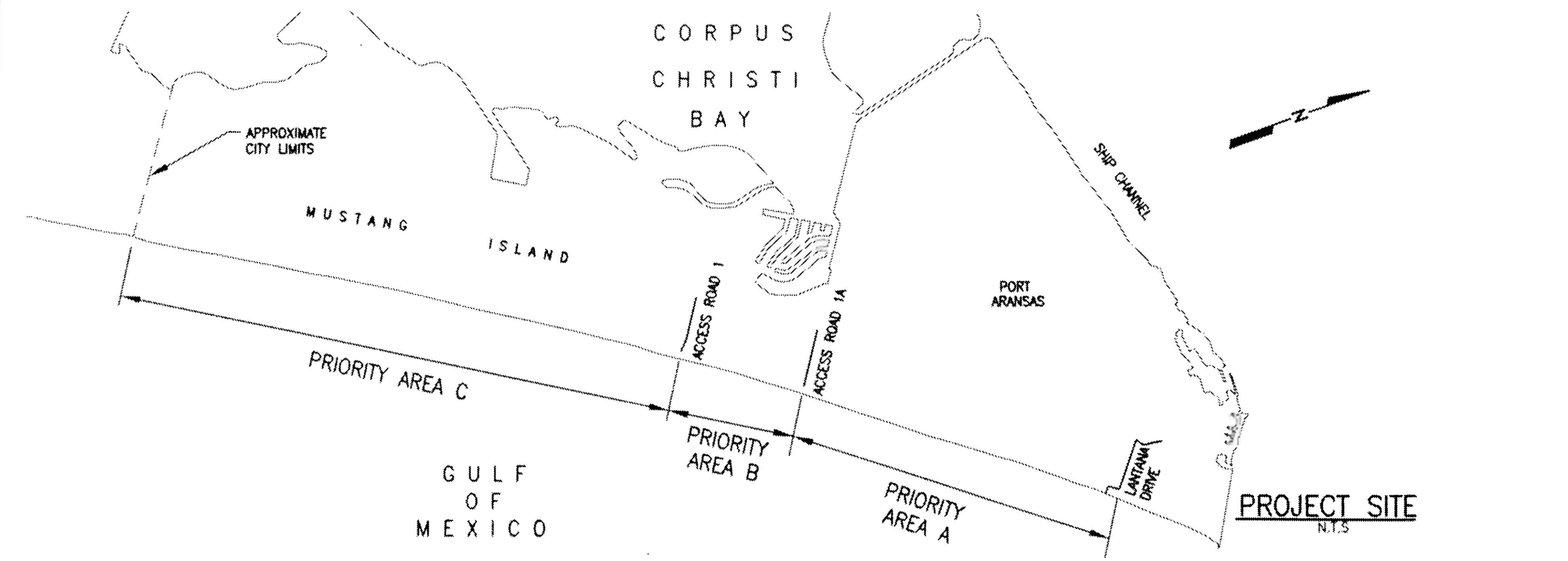






BEACH MAINTENANCE PRIORITY AREAS



FOR COE USE ONLY	APPLICANT: CITY OF PORT ARANSAS
Permit Application No.: SWG-2007-1847	PROJECT NAME: GULF BEACH CLEANING
Applicant Name: City of Port Aransas	COUNTY: NUECES
Sheet 2 of 8	DATE: 08/07 · REV. DATE: 8-14-2007 · DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 · SHEET 02 of 08

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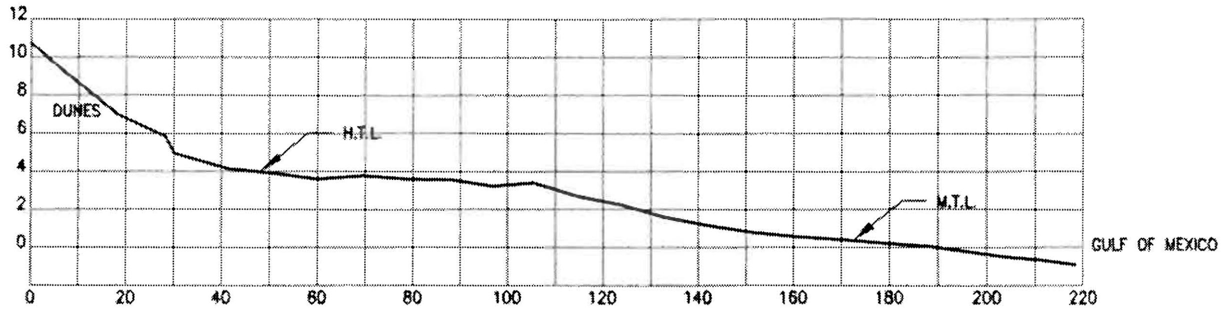
EXISTING CONDITIONS 1/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 1 IS LOOKING NORTH AT MIRAGE CONDOMINIUM.
4. SECTION 2 IS LOCATED AT MARKER 48 LOOKING NORTH.

OCT 3 0 2007



2 | 1 | 2 EXISTING CONDITIONS - SECTION

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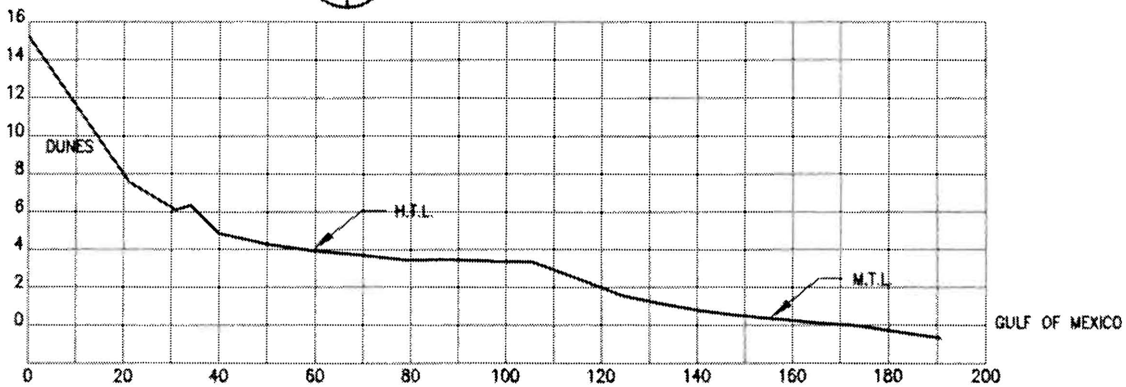

1 | 1 | 2,5,6 EXISTING CONDITIONS - SECTION

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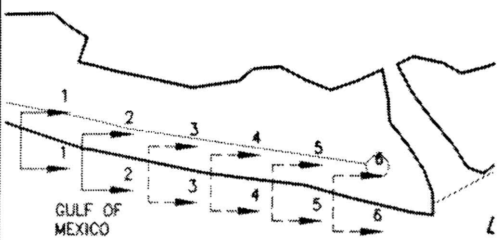

HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 3 of 8

APPLICANT: CITY OF PORT ARANSAS	
PROJECT NAME: GULF BEACH CLEANING	
COUNTY: NUECES	
DATE: 08/07	REV. DATE: 8-14-2007	DATUM: NAVD'88

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 03 of 08

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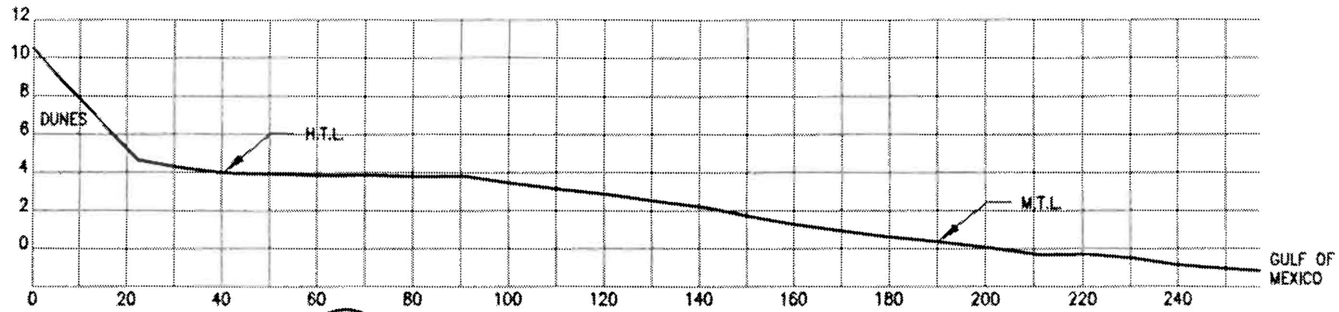
EXISTING CONDITIONS 2/3

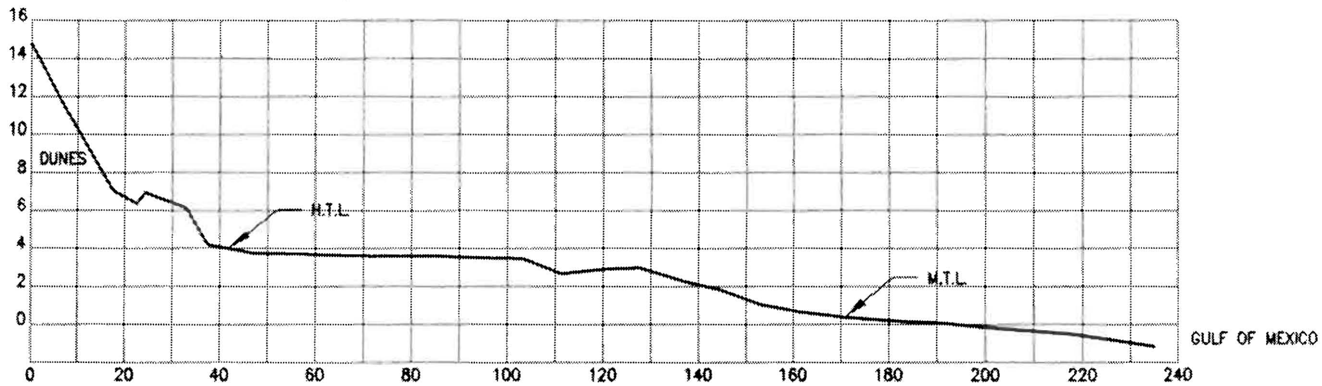
NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 3 IS LOCATED 300' NORTH OF MARKER 35 LOOKING NORTH.
4. SECTION 4 IS LOCATED AT MARKER 22 LOOKING NORTH.



4 | 1 3 — EXISTING CONDITIONS - SECTION

SCALE: GRAPHIC



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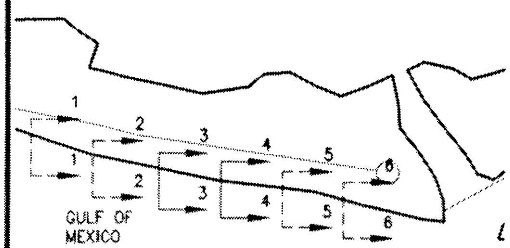


HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 4 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

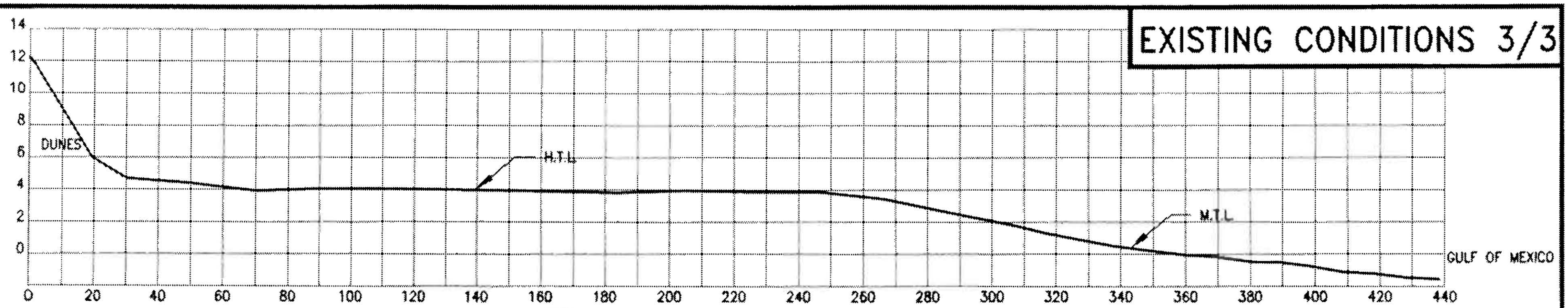
DATE: 08/07 | REV. DATE: 8-14-2007 | DATUM: NAVD'88

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

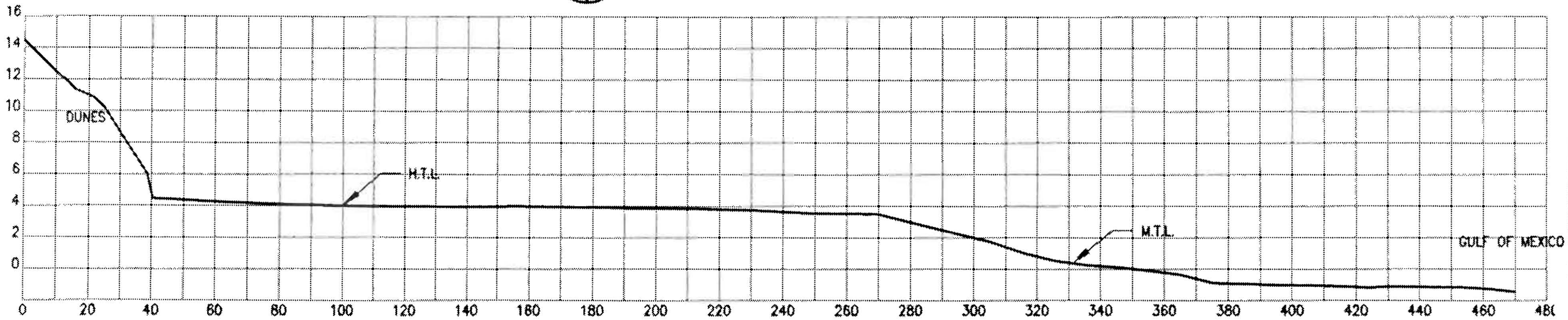
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 04 of 08

EXISTING CONDITIONS 3/3



6 | 1 | 4
EXISTING CONDITIONS - SECTION
SCALE: GRAPHIC

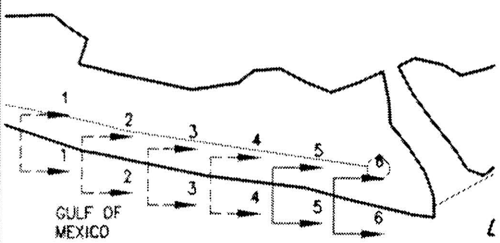


5 | 1 | 4
EXISTING CONDITIONS - SECTION
SCALE: GRAPHIC

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR/SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 5 IS LOCATED AT MARKER 10 LOOKING NORTH.
4. SECTION 6 IS LOCATED SOUTH OF LANTANA DRIVE BY DUNES CONDOMINIUM.

HORIZONTAL 0 25' 50'
VERTICAL 0 5' 10'



FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 5 of 8

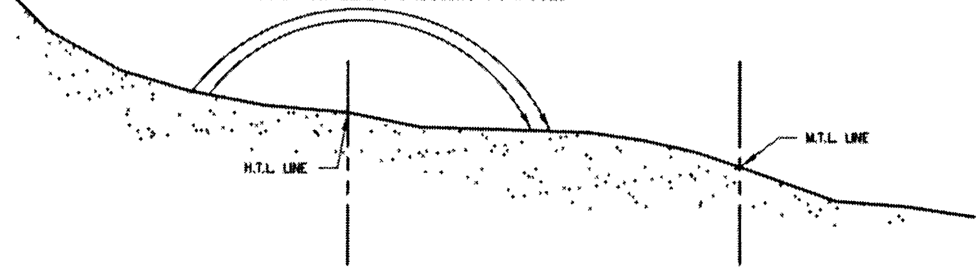
APPLICANT: CITY OF PORT ARANSAS
PROJECT NAME: GULF BEACH CLEANING
COUNTY: NUECES

DATE: 08/07	REV. DATE: 8-14-2007	DATUM: NAVD'88	PROJECT No: 66107	SHEET 05 of 08

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

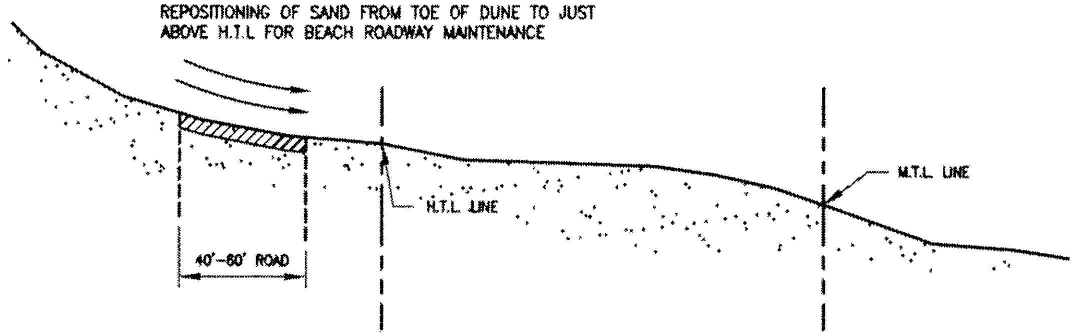
PROPOSED BEACH MAINTENANCE PRACTICES

OCT 30 2007



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.



2 | 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

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FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 6 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 06/07 | REV. DATE: 8-14-2007 | DATUM:

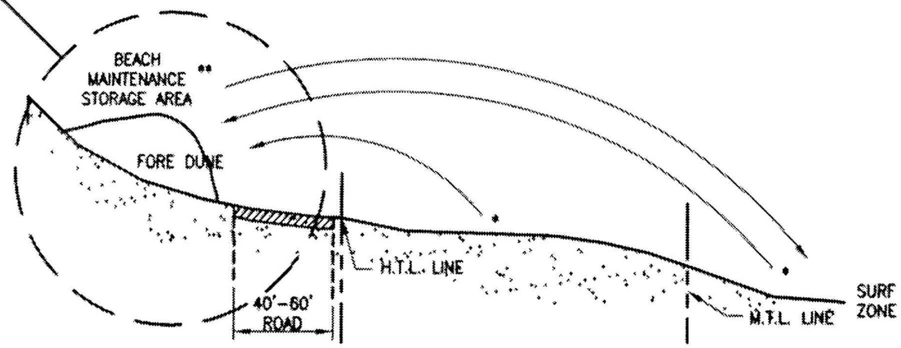
HDR | SHINER MOSELEY AND ASSOCIATES, INC.

555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 06 of 08

PROPOSED BEACH MAINTENANCE PRACTICES

1 | 7 | 8 — SEE DETAIL FOR ALTERNATE PLACEMENT AREAS ON SHEET 8 OF 8

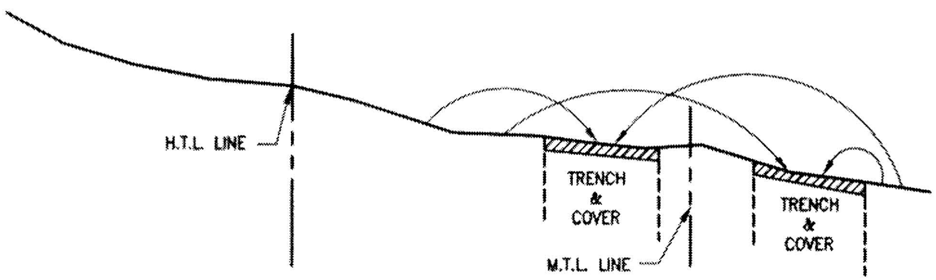


* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.

1 | 1 | 2,5,6 — PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

1 | 5 | 5 — PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

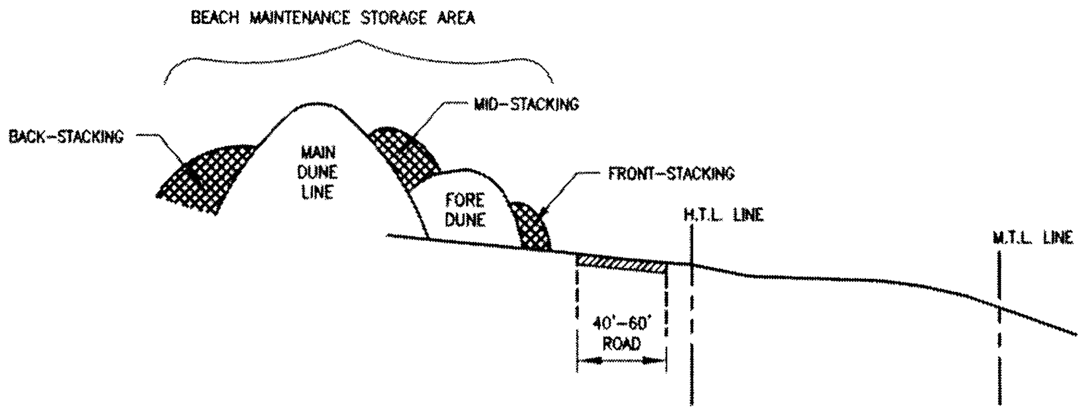
FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 7 of 8

APPLICANT: CITY OF PORT ARANSAS
PROJECT NAME: GULF BEACH CLEANING
COUNTY: NUECES
DATE: 06/07 | REV. DATE: 8-14-2007 | DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 07 of 08

PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 | 2,5,6

PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

ALTERNATE PLACEMENT AREAS

SAND/SARGASSUM IS PROPOSED TO BE PLACED IN THREE LOCATIONS WITHIN THE BEACH MAINTENANCE STORAGE AREA:

A. FRONT -STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM ABOVE H.T.L AT BASE OF FOREDUNE ON ACCRETING BEACHES ONLY.

B. MID-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM WITHIN TROUGHS BEHIND THE FOREDUNE ON ALL BEACHES.

C. BACK-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM IN BACK OF THE MAIN DUNE LINE ON ALL BEACHES.

FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 8 of 8

APPLICANT: CITY OF PORT ARANSAS
PROJECT NAME: GULF BEACH CLEANING
COUNTY: NUECES
DATE: 06/07 | REV. DATE: 8-14-2007 | DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 08 of 08

Kimmel, Matthew L SWG

From: Ofilia Perez [Ofilia.Perez@noaa.gov]
Sent: Friday, December 14, 2007 2:59 PM
To: Guevin, Bryan L SWG; Jaynes, Thelma C SWG; Kimmel, Matthew L SWG; Herrington.Jim@epamail.epa.gov
Subject: No comments

The NOAA's National Marine Fisheries Service (NMFS) has reviewed the Department of the Army permit applications listed below. The resources affected are not ones for which NMFS is responsible and, therefore, we have no comment regarding issuance of the permits.

Notice: 24381(01)
Applicant: Steve Cowart
Notice date: 12/10/07

Notice: SWG-2007-659
Applicant: City of Pearland
Notice date: 12/12/07

Notice: SWG-2007-975
Applicant: Jack Miller
Notice date: 12/13/07

Notice: SWG-2007-1847
Applicant: City of Port Aransas
Notice date: 11/30/07

TASK IV DELIVERABLE
FINAL REPORT TO THE TEXAS GENERAL LAND OFFICE
GLO Contract No. 06-076C, Work Order No. 1311-06-001

STRATEGIES FOR MANAGING SEDIMENT ON PUBLIC BEACHES CITY OF PORT ARANSAS, TEXAS

Kimberly K. McKenna, P.G.
P.O. Box 9586, Newark, DE 19714
k.k.mckenna@comcast.net

INTRODUCTION

In 2005, Hurricanes Emily, Katrina, and Rita deposited large amounts of sand on the public beaches of Port Aransas, Texas. Because the City of Port Aransas (City) is the custodian of the public beach within its borders, it ensures that access is not blocked or prohibited. In response to the storm deposits, the City relocated the accumulated sand to the water's edge and along the line of vegetation. Some local residents became concerned about potential impacts of this procedure on beach stability. To address the concerns, the City Council created the Beach Maintenance Committee (BMC) composed of local scientists, business people, and residents to review the beach maintenance actions and provide the City Council with recommendations for management practices for beach cleaning and disposal of unwanted trash that would comply with local, state, and federal rules for erosion response, dune protection, and public access.

The objective of this study is to review the beach management practices of the City and recommend alternatives to existing practices to ensure public beach access, and protection of the beach/dune environment. This report provides background information on beach use, maintenance practices, shoreline change patterns, and discussions by the BMC, and recommends changes in some maintenance practices.

The City of Port Aransas is a destination resort located at the north end of Mustang Island in south Texas (Figure 1). The main attraction is the 7.5 miles of white, sandy beaches that line the Gulf of Mexico. The small town with 3700 year-round residents changes into a bustling community of 80,000 during the peak visitation periods (Spring Break and summer weekends in June through August) (D. Parsons, City of Port Aransas, 2006, personal communication). The additional human insurgence places stresses on the management of the beach/dune environment as tourists can have different expectations for their beach experience than local residents. All management efforts need to provide an accessible environment that is safe and clean.

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The City approved a set of policies for managing this complex natural resource that is prone to flooding and provides protection to highly valued land: the *Port Aransas Coastal Management Plan* (1995). This plan, adopted by the City and certified as rule by the Texas General Land Office (Land Office) provides the baseline policies for preserving the public use of the beach and ensuring protection of dunes.

Figure 1. City of Port Aransas location map, aerial vertical photograph, and photograph of the dunes and beach.

The City is bound by its *Coastal Management Plan* to protect access to and use of the public beaches (section VIII, B. 3 on page 33). The City has interpreted this section to maintain trouble-free driving on the beach road (or vehicular travel way) as it has continued this practice for a several decades. The City's Public Works Department is responsible for not only beach maintenance and cleaning, but for the City's sanitation, roads, and rights of way. The Public Works Director determines when the beaches are cleaned or when the vehicular travel way needs maintenance. Determinations are based upon use and conditions, and are not a regularly scheduled or routine activity. Figure 2 shows the nomenclature typically used by the City for its beaches.

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Figure 2. Aerial photograph of a section of public beach in Port Aransas with terminology describing areas (base photograph from http://earth.google.com).

ISSUES

Preserving public access to the beaches and keeping them clean are two priority issues for the City. Another critical component that should be incorporated in the City's access and cleaning priorities is the protection of existing foredunes, and the practice of allowing natural dune formation. Dunes are essential for providing a sand supply to the beaches and for protecting landward properties during storms.

As a destination resort, the City hosts tourists from Texas and elsewhere who are drawn to the Gulf waters and white sandy beaches. The City charges a parking fee to offset the costs of maintaining public access and permits can be obtained from various locations within the City including beach vendors. Two issues of concern arise from the popularity of the City's beaches: maintaining access (while protecting dunes) and keeping the beaches clean.

ISSUE #1 MAINTAINING ACCESS, VEHICULAR TRAVEL WAYS, AND PEDESTRIAN SAFETY AREAS

Vehicular Travel Way and Beach Parking

Driving on the beach is a well established tradition in Texas as the long stretches of beach were the first traveled roadways and the City continues the tradition. To maintain a usable road surface ("hard pack") for trouble-free driving by both four-wheel and two-wheel drive vehicles, the City's Public Works staff generally grades (blades) the vehicular travel way (beach road) and the beach parking area. Blading the backshore area occurs more often during dry periods, when the water table occurs at greater depths.

In the summer of 2006, blading was not necessary to maintain the travel way because of wetter conditions and an elevated water table (Figure 3). At times, when it is necessary to remove the sand from the travel way and parking area, the sand is pushed into the pedestrian beach area and spread above the mean high water (MHW) line. The sand from the travel way typically does not contain trash.

Figure 3. View of the City's vehicular travel way located on the backshore adjacent to the dunes. This area has not been bladed since June 2006 (photograph taken August 8, 2006).

Grading the vehicular travel way can be considered beach scraping or an artificial manipulation of the beach profile and that has invoked discussions on beach and dune stability and impact to native fauna. In some areas of the U.S. coast, scraping the dry portion of the beach has become a practice for protecting dunes and structures. Here, as in some other areas of the Texas coast, this practice is used to allow continued public driving access. However, scraping the back beach can destroy coppice mounds, prevent new coppice mounds from forming, and can lower the beach elevation. This can allow storm surge, waves, and run-up to propagate further inland as the volume of beach sand is decreased. Studies have found that modest scraping of "surplus" sand and placing it at the toe of the dunes helps protect them, but conclude that this practice should be used only as a temporary measure (Kana and Svetlichny, 1982; Bruun, 1983) and limited to the area inundated by daily tides (McNinch and Wells, 1992). Most of the City's beaches are wide enough so that the location of the vehicular travel way is not exposed to the normal range of tidal waters. However, scraping the vehicular travel way should only be completed in an emergency situation.

Environmental issues may also arise when the travel way is scraped. In this portion of the Texas coast, some endangered sea turtle species nest in the backshore and dunes, and scraping could potentially destroy nests. A 1998 study of the impacts of beach scraping on macroinvertebrates on Bogue Banks, North Carolina found that ghost crabs did not recover for six to eight months following the scraping event, and that they probably would not recover if the beach was scraped every year (Lindquist, 2001). The Lindquist study suggests that moving beach sand, even within the beach/dune system, can have deleterious consequences and should be limited to emergencies only. But how do you balance providing relatively trouble-free public access with protecting the wildlife that helps draw the public to the beaches? The City's *Coastal Management Plan* (1995) prohibits beach maintenance activities that result in the "significant redistribution of sand or alter the beach profile" (see section VIII, B, 12 on page 39). According to some residents, "significant" quantities of sand have been removed or relocated, and the beach profile has been lowered so that ground water floods the beach road after high rain events. Current scraping practices should be evaluated and altered to minimize the impacts to the beach/dune system and its native fauna. Monitoring the maintenance activity with respect to changes in the beach profile and impacts to fauna can provide the information that can be used to better manage the vehicular travel way.

Pedestrian Beach (Safety) Area

The Pedestrian Beach Area is marked by wooden bollards on the beach and is a designated safety area free from vehicles from the water to the backshore (Figure 2). This protected area stretches from Lantana Drive (south) to Access Road 1A (Figure 4). The pedestrian beach is heavily used by the local population, tourists, and concessionaires who rent beach umbrellas and sell beach permits and other items. This area is inundated by tidal waters and seaweed and trash from the Gulf of Mexico are often deposited here.

Clearing trash and debris from the pedestrian beach areas is usually completed manually by the Public Works staff and front-end loaders are used to remove large amounts of accumulated seaweed. Normal amounts of seaweed are left on the beach throughout the City limits. The seaweed provides food and habitat for shorebirds and invertebrates, and it can trap blowing sand.

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Figure 4. Aerial photograph showing beach access roads in the City of Port Aransas (base photograph from http://earth.google.com).

ISSUE #2 MARINE DEBRIS, RECREATIONAL TRASH, ORGANIC DEPOSITS

The amount of marine debris along Mustang Island and North Padre Island can sometimes be overwhelming. Figure 5 shows a recent deposit of seaweed. Marine debris and floating organic material are deposited as a result of two Gulf currents – the Loop Current which moves water from the Mexican Yucatan Peninsula to the Florida Straits, and its offshoot Gyre Current, an opposing current that moves southwestward along the Texas coast. Prevailing winds from the southeast push the marine debris onshore. While recreational trash is a problem, the majority of the trash appears to be from shrimp boats (Amos, undated report to the Padre Island National Seashore).

To maintain a safe pedestrian area and driving and parking areas, the City has removed trash and excessive seaweed deposited on the beach using a front-end loader. The mixture of seaweed, sand, and trash were placed in piles adjacent to the vegetation line along the landward boundary of the vehicular travel way. Sometimes, seaweed was taken to southern areas (near Access Road 1) where there is less public use and the shoreline is eroding. The deposits can facilitate the creation of new dunes. The City must limit the trash in the seaweed so as not to create solid waste according to rules of the Texas Commission of Environmental Quality (TCEQ) (Texas Administrative Code 30 Ch. 330 Municipal Solid Waste §§330.1-330.25). In addition, large amounts of decaying seaweed can create an unpleasant odor.

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Figure 5. Photograph showing a pocket of extreme amounts of seaweed deposited in the pedestrian beach area.

SHORELINE CHANGE

As the state geological survey, the Texas Bureau of Economic Geology (BEG) is directed to determine shoreline change rates for the Gulf and bay beaches. Shoreline change rates are indicators of beach stability or erosion and are helpful for planning and managing coastal projects. Previous studies have combined aerial photography and beach profiles to determine shoreline change over time periods ranging from short term -1970's to 1980's (Paine and Morton, 1989) to long-term – 1800's to 1982 (Morton, 1993). These publications provide the trends for particular time periods but those trends may change as the shoreline is in constant flux due to the dynamics of sediment supply, long-term relative sea level rise, and episodic storm events. The latest shoreline mapping technique uses LIDAR (Light Detection and Ranging) surveys and beach profiles to measure the topography of the beaches and dunes. The BEG compares the elevation information gained from these surveys with historical shorelines to calculate annual rates of shoreline change (Gibeaut, et. al, 2001).

When the long-term (1800's and 1930's to 1980's and 2000) shorelines are compared, the Gulf beaches of Mustang Island and North Padre Island are experiencing net erosion (Morton, 1993; Gibeaut, et al, 2001). Figure 6 shows the shoreline changes for the City with the trends as provided in the figure legend (BEG http://coastal.beg.utexas.edu/website/coastal%5Fhazards2/viewer.htm). The beaches here vary from erosion (about -1.5 meters [4.92 feet] per year) in the southern region of the City limits to accretion (about +0.5 meters [1.64 feet] per year) near the Horace Caldwell Pier (Gibeaut, et. al, 2001). The installation of the Aransas Pass jetties in 1911 has led to the impoundment of sand on both sides of the pass and the shoreline change rates vary from erosion (- 6 ft/yr) to stable (-2 ft/yr to +2ft/yr) and accreting (+3 ft/yr). Data providing specific shoreline change rates in numerical format are available from the BEG at http://coastal.beg.utexas.edu/website/coastal%5Fhazards2/viewer.htm.

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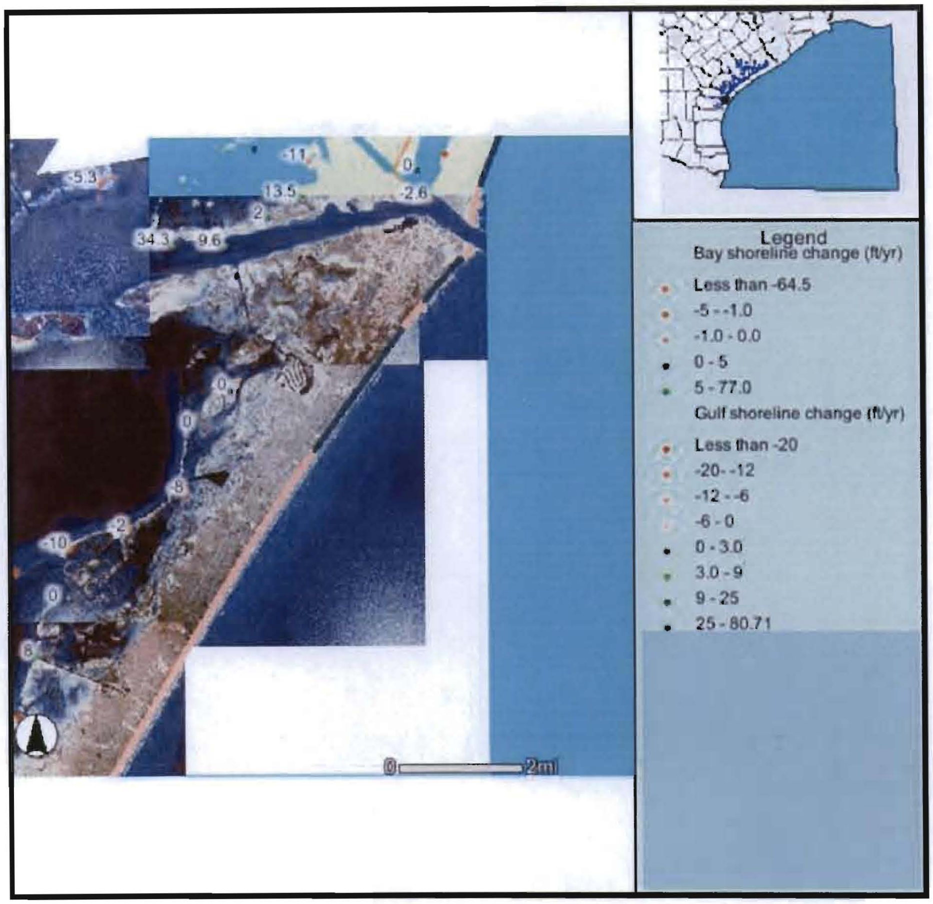

Figure 6. Shoreline change map for northern Mustang Island and including the City of Port Aransas. In general, pink dots represent erosional and green dots represent stable shorelines (from the University of Texas at Austin Bureau of Economic Geology http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm).

OPTIONS DISCUSSED BY THE BEACH MAINTENANCE COMMITTEE (BMC)

The bulk of discussions by the BMC were about the City's beach maintenance activities, beach access, dune protection, and environmental concerns. Local citizens provided input and City staff provided information on how beaches were maintained and offered ideas for changes to maintenance procedures. This section summarizes ideas that were discussed by the BMC and other information that may help the City in making management decisions.

1. Dividing beach maintenance practices into three work zones.

The BMC and City staff discussed alternative beach maintenance strategies for different sections of the beach. Area A represents the pedestrian beaches from Lantana Drive to Access Road 1A. This area receives the most day use as many people walk to the beach from homes, condominiums, and motels. Area B represents the beach parking area from Access Road 1A to Access Road 1. This area receives the most "pull-up" parking. Access Road 1 south to the City limits represents Area C which is the least developed and receives the least amount of visitors. Discussions focused on prioritizing the City's

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maintenance in each management area. The consensus was that Area A would be given highest priority because of its heavy use. The bollards that mark the landward limit of the Pedestrian Beach actually extend about 200 feet south of Access Road 1A, into Area B, but management criteria will follow those set for the Pedestrian Beach in Area A. Area B would be considered a transition zone between intensively managed Area A and minimally managed Area C (Port Aransas Beach Maintenance Committee, 2006).

Figures 7, 8, and 9 show the three management areas with the corresponding shoreline change rates as provided by the BEG in the *Texas Coastal Hazards Atlas* ArcIMS data set (http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm). The purpose of adding the shoreline change rates to the management area maps is to show where eroding beaches occur and beach maintenance practices should take into consideration the fluctuations of the shoreline. Eroding shorelines could become potential flood hazard areas and it may be possible to mitigate the effects of shoreline erosion during beach cleaning by placing collected seaweed along the vegetation to trap blowing sand.

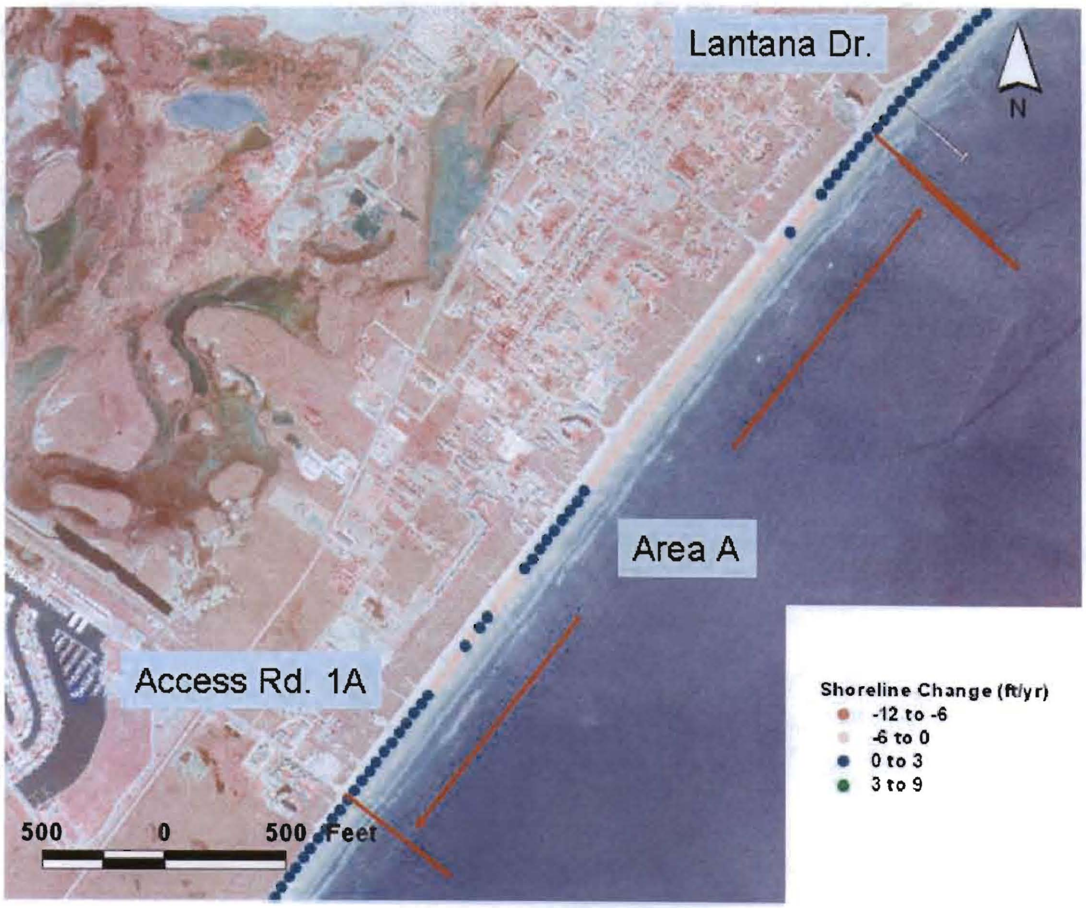

Figure 7. Aerial photograph showing proposed management Area A and the corresponding shoreline change rates. Pink circles represent erosional trends and green circles represent stable trends (sources: digital shoreline change http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm and DOQQ data from the Texas Natural Resources Information System at http://www.tnris.org/NAIPSearch/CountyQuads.jsp?Counties=355&map.x=440&map.y=163).

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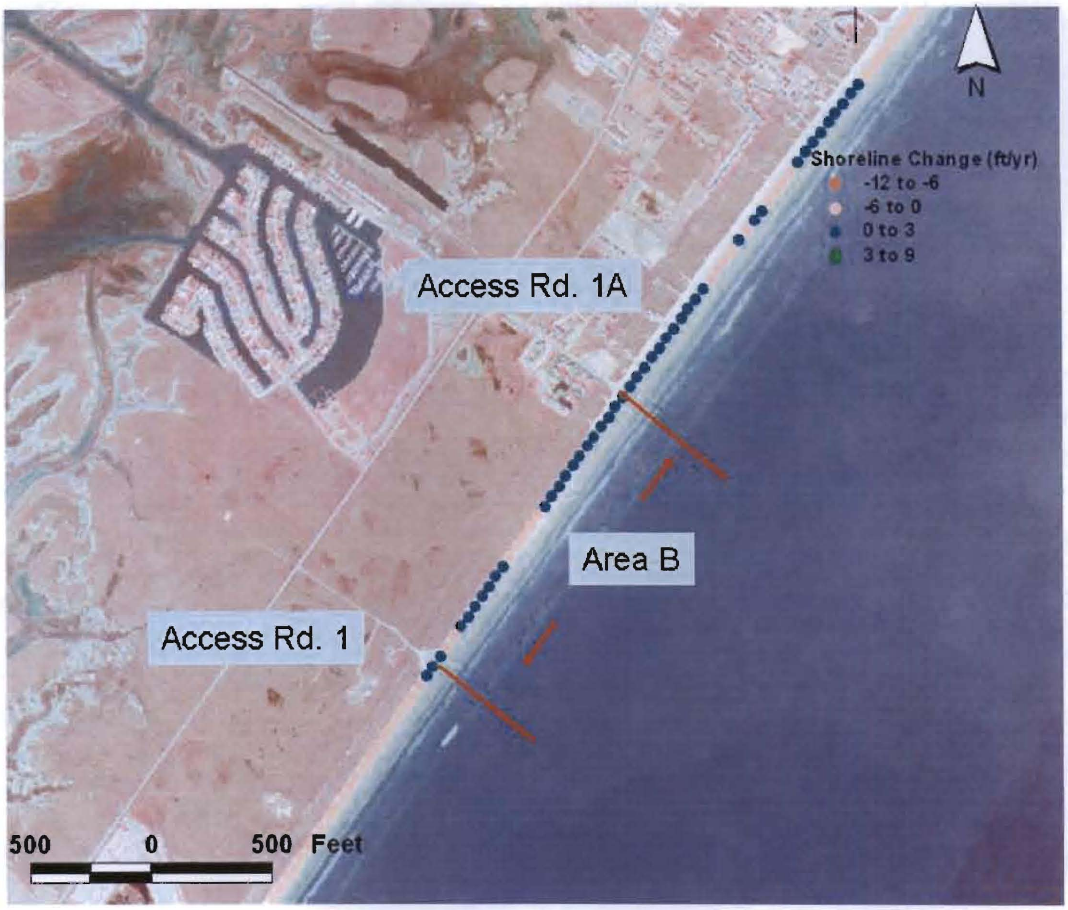

Figure 8. Aerial photograph showing proposed management Area A and the corresponding shoreline change rates. Pink circles represent erosional trends and green circles represent stable trends (sources: digital shoreline change http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm and DOQQ data from the Texas Natural Resources Information System at http://www.tnris.org/NAIPSearch/CountyQuads.jsp?Counties=355&map.x=440&map.y=163).

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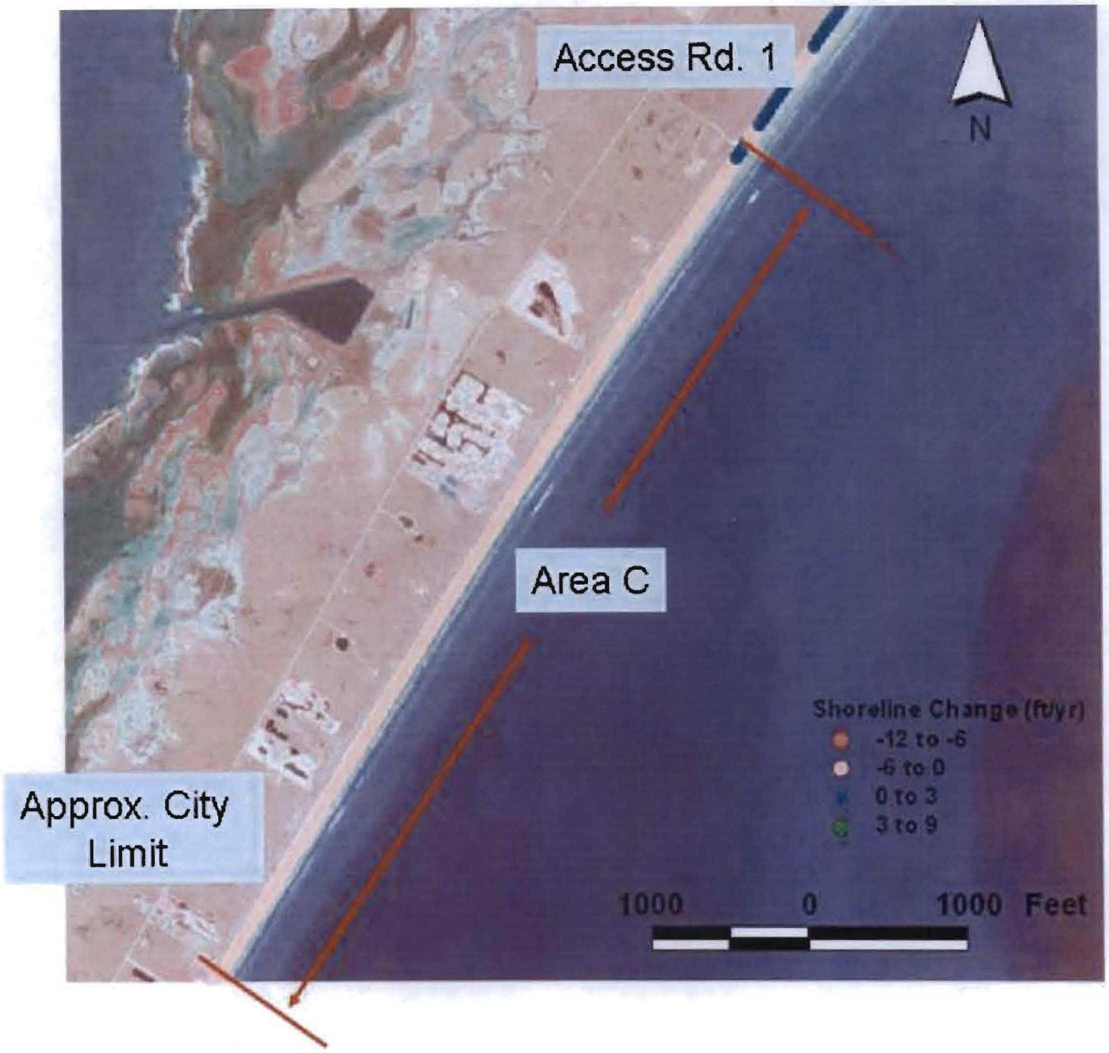

Figure 9. Aerial photograph showing proposed management Area A and the corresponding shoreline change rates. Pink circles represent erosional trends and green circles represent stable trends (sources: digital shoreline change http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm and DOQQ data from the Texas Natural Resources Information System at http://www.tnris.org/NAIPSearch/CountyQuads.jsp?Counties=355&map.x=440&map.y=163).

2. Limiting grading of the vehicular travel way by adding water on the backshore to maintain trafficability.

Under dry conditions, backshore sands tend to be soft and it can be difficult for two-wheel drive vehicles to operate easily. Sandy beaches are firmer when damp and can support traffic. Wetting the beaches can increase the tensile strength, cohesion, and friction of the sand surface (Kim and Sture, 2004). In theory, wetting could improve the trafficability on the backshore. The City would need to experiment with the amounts of water added to the backshore, and determine the required reapplication schedule. The use of fresh water was suggested for ecological reasons, but could add to maintenance costs if treated drinking water is used rather than non potable water. This action may also involve drilling new wells and acquiring permits for allocation. Though, this suggestion could be a worthwhile endeavor if traffic can move freely on the travel way.

3. Moving the bollards that are located along the line of vegetation seaward 25 to 40 feet so that traffic can continue on a harder surface and to allow natural dune growth.

The City beaches have a good supply of sand and wind to move it. These are essential circumstances for sand to accumulate in the landward side of the bollards and eventually form dunes, and this is a positive benefit for storm protection. However, moving the bollards seaward could reduce the size of the beach where the public now has free and unrestricted access. Also, if the bollards that line the Pedestrian Beach safety area are moved seaward, this could reduce the amount of space that is available for visitors between the high water line and the bollards.

The rules for restored dunes adopted under the City's *Coastal Management Plan* state that the restored area extend no further seaward than 20 feet of the landward boundary of the public beach (line of vegetation) and should not restrict public use at normal high tide (see section VIII, B. 9 on page 36). The City may be able to negotiate this distance with the Texas General Land Office (Land Office) and the Office of the Attorney General if the City can demonstrate that dunes could naturally form seaward of the 20-foot boundary.

In addition, care needs to be taken in moving the vehicular travel way seaward. The beach surface should be sufficiently firm to carry vehicles. Soft zones can be common on the beach and can be found typically near the upper level of wave run-up at high tide (because air pockets can be trapped under the wet sand).

4. Using the land owned by the Land Office as a test area for seaweed and sand disposal.

One suggested alternative location for placing sand and seaweed is known as the Land Office land. Figures 10a and 10b are aerial photos showing the general location of this "wedge" of land which is located between Lantana Drive and Access Road 1A. Figure 11 shows the general morphology of the area behind the present-day foredunes. Prior to the installation of the Aransas Pass jetties in 1911, this land would have been classified morphologically as the backshore and foredunes (seaward of the line of vegetation). Since construction of the jetties, this portion of the shoreline has widened, new foredunes formed, and the line of vegetation moved seaward. The Land Office issues leases and easements for the few structures that are located in this area. The land is conveniently located to the public beaches, but any City dune project or test area for seaweed disposal located on this land will require consultation with the Land Office.

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a.

b.

Figures 10 a. and b. Aerial photographs showing the approximate location of the land owned by the Land Office (between the blue lines). (Photographs courtesy of D. Parsons, City of Port Aransas, 2006.)

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Figure 11. Photograph of the Land Office land behind the present-day foredunes (view to the south).

5. Finding a commercial use for seaweed.

Information on commercial uses of seaweed for fertilizer is available through many websites. (An example can be found at Neptune's Harvest – an organic fertilizer that is a combination of fish and seaweed http://www.dirtworks.net/Neptune's-Information.html). The City may want to investigate the feasibility of selling the seaweed to a processor, but only for excessive beach deposits, not for offshore commercial harvest. The seaweed may need to be free of trash to be marketable. The City may also want to compost trash-free seaweed at an off-beach location and use it for fertilizer on City properties.

6. Testing beach cleaning equipment.

Appendix A provides a list of websites for purchasing beach cleaning machinery. Some of the machinery has been used by other U.S. coastal communities with success in both dry and wet sand. Some communities fabricate their own beach-cleaning machines (J. Van Fossen, City of Ocean City, Maryland, personal communication, 2006). Many companies would provide demonstrations of their products at no cost to the City.

7. Testing snow blower-type of equipment to project seaweed only into existing foredunes.

The City should carefully coordinate a demonstration project for the projection of seaweed into the dunes, as the activity will definitely raise attention from visitors. Items to monitor include elevation and vegetation changes in the demonstration area.

8. Allowing light seaweed accumulations to remain on the beach.

Allowing the natural accumulation of seaweed on the public beach serves to provide food and habitat for shorebirds and invertebrates, and it can trap blowing sand. Some tourists may consider the beach dirty, however the City could provide pamphlets that describe the importance of leaving some seaweed on the beach.

9. Taking advantage of natural driving areas in areas with no Pedestrian Beach safety area.

The southern portion of the Pedestrian Beach safety area ends near Access Road 1A. South to the City limits, the City allows parking closer to the Gulf and through beach drivers can follow the vehicular travel way designated by the City. The vehicular travel way could be moved seaward to more firm areas of the beach; however, the City may need to review or alter its code (Section 23-143 of the Port Aransas Code) that prohibits the operation and parking of vehicles within 50 feet of the water's edge.

10. Avoiding depositing sand in the seaward direction.

With the use of new beach cleaning equipment or new management techniques of the vehicular travel way, there should be very little to no need to relocate sand. However, in the case of emergencies, the City should designate an area to receive redistributed sand. The Port Aransas *Coastal Management Plan* states that sand should be returned to a location seaward of the City's dune protection line or within critical dune areas (section VIII, B., 12, page 39). This can include areas seaward along the vegetation line, or with consultation, the land owned by the Land Office. If the beach area from the spring high tide line and seaward is chosen for the redistribution of sands, then the City must apply for a permit from the US Army Corps of Engineers (USACE), (Section 404 (b)(1) of the Clean Water Act 33 U.S.C. 1344 and Section 10 of the Rivers and Harbors Act of 1899 33 U.S.C. 403) (Figure 12). Permit applications are subject to public notice and comment, and the USACE must address public concerns when considering issuing, denying, or conditioning a permit.

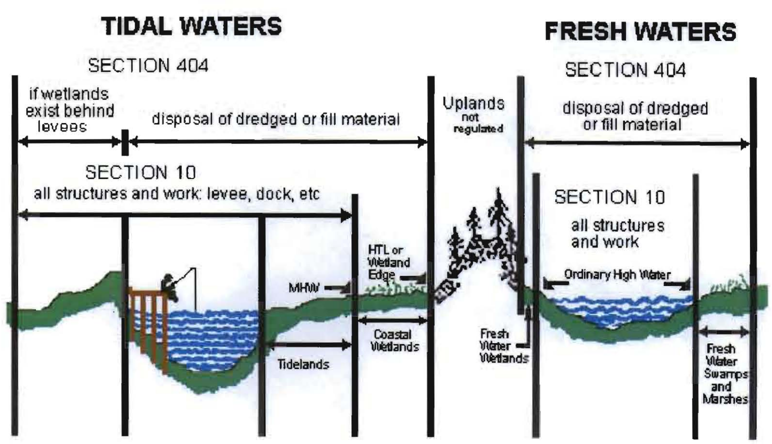

Figure 12. Illustration showing U.S. Army Corps of Engineers permitting jurisdiction (from USACE, http://www.spn.usace.army.mil/regulatory/jd.html, 2006)

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RECOMMENDATIONS

The goal for the City should be to maintain a clean, natural, and public-accessible beach using the best management strategies in regards to the environment. The following recommendations are provided as ideas for the City to consider for its beach maintenance practices.

I. MAINTENANCE OF VEHICULAR TRAVEL WAYS

1. Determine seasonal traffic patterns and maintenance needs for peak use times or special events and establish maintenance goals and methods for obtaining them.

2. Halt the practice of using box blades, graders, or front-end loaders to scrape the travel way unless emergency conditions exist.

3. Establish a protocol for emergency relocation of sand from the vehicular beach travel way. Example actions are:

    a. Redirect sand that accumulates from storm deposits, taking care not to lower the beach profile below the pre-storm elevation, and place sand in pre-determined areas (General Land Office land or along the line of vegetation on the eroding stretches of shoreline-avoid areas located seaward of the spring high tide line unless a permit from the US Army Corps of Engineers has been obtained); or
    b. No Action - Leave newly deposited sand in travel way and reroute travel way; or
    c. Allow scraping of the travel way only when the City determines that public safety is at risk; or
    d. Designate emergency placement areas.

4. Relocate the landward bollards of the beach vehicular travel way no more than 20 feet seaward of the line of vegetation if there is enough room for vehicles to pass, if the bollards do no interfere with normal high tide, and the Pedestrian Beach safety area is unaffected. The 20-foot determination is a requirement stated in the City's *Coastal Management Plan* regarding restored dunes on public beaches (section VIII, B. 9 on page 36). The bollards can be compared to sand fencing in that the bollards can be used to mark the landward limit of public access and can slow winds allowing sand deposition and dune growth. The Land Office (and Office of the Attorney General) may choose to negotiate this distance with the City if the City can show that dunes would naturally form. Such evidence could include aerial photographs, beach/dune profiles, or on-ground photographs of former locations of the foredunes. The City and the Land Office could evaluate the impacts of the bollards on public beach access and dune growth at a later time and renegotiate moving the bollards further seaward.

5. The City should inspect driving conditions and post placards for drivability (ex. soft – four-wheel drive only).

6. Provide public information pamphlets with Beach Parking Permits or placards that discuss driving in soft sand, suggest limiting beach driving hours to daytime and early evening in case help is needed, and provide numbers of towing companies.

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II. REMOVAL AND DISPOSAL OF MARINE DEBRIS, RECREATIONAL TRASH, AND SEAWEED

1. Purchase or design and utilize beach cleaning equipment that can separate trash, seaweed, and sand. (See Appendix A for information on beach-cleaning equipment.) The equipment should be designed to remove debris on wet sand in the high public use areas such as the Pedestrian-only beach and be able to handle excessive amounts of seaweed.

2. Clean beaches during times when visitation is minimized (late night or early morning).

3. Haul away separated recreational trash and marine debris to a local transfer area or landfill.

4. Establish a protocol for responding to excessive seaweed deposits that includes the following:

    a. Create a temporary off-beach storage site.
    b. Extract trash from seaweed prior to moving to storage site.
    c. Temporarily store seaweed to compost. (The clean-up, staging, trash extraction, and composting would not require a municipal solid waste permit from the TCEQ – see 30 TAC §330.13 (g) and §332 for information on exemptions).

5. Allow light accumulations of seaweed to remain on the beach.

6. Utilize restricted beach cleaning practices during sea turtle nesting season. Example actions are:

    a. Hand pick only.
    b. Use mechanical methods for beach cleaning during daylight hours after a check on nesting activities.
    c. Cordon off nest areas and avoid cleaning these areas with heavy equipment.

7. Hire seasonal employees or utilize the Sunny Beaches non-profit organization (http://www.sunnybeaches.org) for additional assistance in hand picking beach debris.

8. Provide training for all beach cleaning equipment operators.

9. Provide public information pamphlets with the beach parking permits that describe the importance of the beach/dune system, the natural environment and its flora and fauna, marine debris, proper disposal of recreational trash, and how to drive on a beach. Encourage good stewardship of the public beach and nesting areas.

10. Request that state and federal authorities continue to support and enforce rules for disposing of marine debris (MARPOL – marine pollution from ships).

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III. RECOMMENDATIONS BY MANAGEMENT AREA

A. AREA A (LANTANA DRIVE TO ACCESS ROAD 1A)

1. Relocate dune bollards no more than 20 feet seaward if the bollards do not interfere with normal high tide, and the Pedestrian Beach safety area is unaffected. The City could negotiate the distance if it can show that dunes would naturally form seaward (see discussion on pages 12 - item #3 and 16 - item #4).

2. Discontinue scraping of vehicular travel way during wet seasons. Determine the feasibility and water and cost estimates for wetting the vehicular travel way during drier conditions.

3. Extensively hand pick trash or use beach cleaning equipment that can separate trash and seaweed from wet sand in the Pedestrian Beach safety area.

4. Develop a protocol for removal of excess sand, seaweed, and trash.

B. AREA B (ACCESS ROAD 1A TO ACCESS ROAD 1)

1. Discontinue scraping of vehicular travel way during wet seasons. Determine the feasibility and water and cost estimates for wetting the vehicular travel way during drier conditions.

2. Use beach cleaning equipment on the beach that can separate trash and seaweed from wet sand.

C. AREA C (ACCESS ROAD 1 TO THE CITY LIMITS)

1. Discontinue scraping of vehicular travel way during wet seasons. Determine the feasibility and water and cost estimates for wetting the vehicular travel way during drier conditions.

2. Use beach cleaning equipment on the beach that can separate trash and seaweed from wet sand.

3. At a minimum, provide vehicular travel way maintenance and seaweed clean up seaward of residential areas and at designated camping areas.

References

Amos, A. F., undated, A Study of Shoreline Trash: 1989-1998 Padre Island National Seashore, Texas, (http://falcon.tamucc.edu/~ejones/papers/pins.pdf#search=%22%22marine%20debris%22%20tony%20amos%22).

Bruun, P., 1983, Beach scraping-Is it damaging to beach stability?: Coastal Engineering, 7; pp.167-173.

Gibeaut, J. C., Hepner, Tiffany, Waldinger, R. L., Andrews, J. R., Gutiérrez, Roberto, Tremblay, T. A., and Smyth, R. C., 2001, Changes in Gulf shoreline position, Mustang and North Padre Islands, Texas: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for the Texas Coastal Coordination Council pursuant to National Oceanic and Atmospheric Administration, under Award No. NA97OZ0179 and GLO Contract No. 00-002R, 28 p.

Kana, T. W. and Svetlichny, M., 1982, Artificial manipulation of beach profiles: *in* Edge, B. L., ed. Proceedings of the Eighteenth Coastal Engineering Conference Vol. II, Cape Town, South Africa, American Society of Civil Engineers, New York, New York, pp. 903-922.

Kim, T-H, and Sture, S., 2004, Effect of moisture on attraction force in beach sand, Marine Georesources and Geotechnology vol. 22, pp. 33-47.

Lindquist, N., 2001, Impacts of Beach Nourishment and Beach Scraping on Critical Habitat and Productivity of Surf Fishes, North Carolina Sea Grant College Project No. 98-EP-05 (http://www.ncseagrant.org/index.cfm?fuseaction=research_item&category=Environmental%20Pilot&type=research&id=704)

McNinch, J. E. and Wells, J. T., 1992, Effectiveness of beach scraping as a method of erosion control, Shore and Beach, vol. 60, no. 1, pp. 13-20.

Morton, R. A., 1993, Shoreline movement along developed beaches of the Texas Gulf coast: a user's guide to analyzing and predicting shoreline changes: Open File Report 93-1, The University of Texas at Austin, Bureau of Economic Geology, 79 p. plus map.

Port Aransas Beach Maintenance Committee, 2006, Recommendations for Changes in Beach Maintenance Practices, compiled by R. L. Watson, 11 p. (http://texascoastgeology.com/beach_recommendations.pdf)

Port Aransas Coastal Management Plan, 1995, adopted by rule by the General Land Office http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=1&ch=15&rl=24.

Funding

Funding for the purchase of new beach-cleaning equipment is available through a competitive grant process from the Land Office Beach Maintenance Reimbursement Fund Program (http://www.glo.state.tx.us/coastal/beachmaintenance/index.html); the Coastal Impact Assistance Program (http://www.glo.state.tx.us/coastal/ciap/index.html); or the Coastal Management Program (http://www.glo.state.tx.us/coastal/grants/index.html). In addition, the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program offers competitive grants for marine debris prevention and removal projects (http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners_funding/callforprojects2.html). Public information documents may also be supported by these programs.

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APPENDIX A INFORMATION SOURCES

List of Websites that Offer Beach Cleaning Equipment

1. Barber Surf Rake http://www.hbarber.com/cleaners/SurfRake/specifications.aspx
2. Cherrington http://www.cherrington.net/pulltype.htm#4000
3. Beach Tech http://www.beach-tech.com
4. S40 Beach Cleaner http://www.sisis.com/machinery/S40.html
5. Rockland Beach King II http://www.cleanbeach.com/beachking.htm
6. Beach Groomers http://www.beachgroomers.com
7. Contant Snow Blower http://www.citysnowblowers.com/indexan.htm
8. National Air Vibrator Company (industrial vibrating tables and shakers) http://www.navco.org
9. Broyhill Beach and Park Maintenance System http://www.broyhill.com/pages/beach_loadnpack.cfm

Other Websites of Interest

1. Beach cleaning practices of Ocean City, MD; San Diego, CA; and Minneapolis, MN http://www.americancityandcounty.com/mag/government_day_beach/

2. Beach cleaning equipment used in Ocean City, MD http://www.town.ocean-city.md.us/pwmaint/beachdivision.html

3. BEG shoreline change maps http://coastal.beg.utexas.edu/website/lowercoast/viewer.htm

4. Texas Natural Resource Information System (TNRIS) base maps (DOQQ) http://www.tnris.org/NAIPSearch/CountyQuads.jsp?Counties=355&map.x=440&map.y=163

5. Trafficability on beaches:

   Mulhearn, P. J., 2001, Methods of obtaining soil strength data for modeling vehicle trafficability on beaches, DSTO Aeronautical and Maritime Research Laboratory Report No. DSTO-GD-0299, Victoria Australia, 20 pp. http://www.dsto.defence.gov.au/publications/2379/DSTO-GD-0299.pdf#search=%22trafficability%20on%20beaches%22

   U.S. Marine Corps (USMC Training Manual): http://www.tpub.com/content/USMC/mcwp212/css/mcwp212_106.htm

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Richard L. Watson, Ph.D., PG

Consulting Geologist

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(361) 332-9720 cell TexasCoastGeology.com
Richard@TexasCoastGeology.com

Comments on Permit Application No. SWG-2007-1847
Permit Application by City of Port Aransas, Texas
Permit Application Issue Date 30 November 2007

Comments by Richard L. Watson 12 December 2007

I have reviewed the permit application No. SWG-2007-1847 prepared by Shiner Moseley and Associates, Inc. for the City of Port Aransas, Texas.

I strongly object to any permit which allows the City of Port Aransas to transport sand deposited naturally by wind or wave action on the beach, the upper beach, or the dunes in a seaward direction. I believe that in some states, this is called sand mining and is strictly forbidden.

There are several proposed actions in this permit application which threaten the long term growth of the foredune ridge system which is the primary hurricane protection for Port Aransas and is in effect a Natural Dune Seawall. The area shown as priority area A has been stable or accreting slightly since jetty construction. Priority area C is showing significant erosion and shoreline retreat. Priority area B is transitional between A and C and may be either stable or retreating and is likely to retreat due to erosion in the future.

The natural direction of sand transport across the beach is from the sea to the land by the prevailing SE winds. During the winter months, there is minor transport in the seaward direction by strong north winds. It is sand movement landward by the SE winds which provides the entire sand source for growth and re-growth of the foredune ridges. Hurricanes and strong tropical storms severely erode the foredune ridge, in some cases as much as 200 ft in a single storm. We are fortunate to have strong, wide and high dune ridges on Mustang Island which serve to protect the property landward of the dunes from frontal hurricane surge overwash, even during severe storms. These dunes are protecting over one billion dollars worth of assessed developed property in Port Aransas.

Growth and healing of the dunes is dependent on sand transport by the wind, and occasionally by development of berms on the backshore by small tropical storms and passage of distant storms such as Hurricane Rita. It takes decades for the dunes to rebuild and heal after erosion by a major storm such as Hurricane Carla (1961) or Allen (1980). After Hurricane Rita, the City of Port Aransas, spent months moving thousands of dump

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trucks of sand from the upper beach to the edge of the water without a Corps permit. That sand was a high berm deposited by Rita. It was sand which was destined to make our dune ridges even stronger. It was my objections to moving that sand seaward that lead to the Corps determining that the City was operating without a permit in moving sand below the MHT line.

In response to my objections about the City's poor beach management practices in the past, the City created a temporary committee to look into the matter. It was composed of citizens which included three coastal scientists, including myself as a non-voting member. In addition the GLO participated in all meetings as did City staff. The GLO also hired a coastal expert (Kimberly K. McKenna, P.G.). MS McKenna attended at least one of our meetings and based her report on our findings, with some changes. The committee unanimously accepted the McKenna report as the final report of the committee. That report was highly critical of moving sand in the seaward direction. A copy of the McKenna report can be found at the following location. It is also presented as an enclosure.

http://texascoastgeology.com/mckenna_report.pdf

Please deny the permit parts 2 and 3 insofar as they move sand from the dune area, or upper or middle beach in a seaward direction. If sand must be moved, it should be placed in front of the foredune system, within the foredunes, or used to build an additional dune ridge landward of the main foredune ridges. This will, at least, allow the sand to reach its natural destination and strengthen the Natural Dune Seawall which is our only hurricane surge overwash protection.

Item 4, removal of Sargassum and sand between HTL and below MTL. It is necessary to remove Sargassum from the heavily used tourist beaches. If this is used to further strengthen the dunes by front stacking, mid stacking and back stacking, it is good use of the sand and seaweed and helps retain the nutrient value of the seaweed which is probably the primary nutrient source for dune vegetation. However, temporary storage of this material in the front of the dune ridges followed by later excavation of it will leave that section of the foredune ridge weak and unvegetated and very subject to rapid erosion during a storm.

The foredune ridge is best protected from small storms when the seaward edge of the dune ridge is a gentle, natural vegetated slope. In that situation wave runup does the least damage. When the edge is a vertical unvegetated scarp as it will be after excavation, the dune ridge will not have vegetative cover, or a root system to protect it and it will be rapidly undercut by waves with subsequent slope failure and rapid dune erosion, even in small storms. Any sargassum and contained sand removed should be placed in or beyond the dune system <u>and left in place permanently</u>. It will rapidly vegetate, strengthen the dune system, and lose the unsightly appearance of freshly deposited material.

Item 5. Conducting leveling of the beach, sand placement and sargassum collection below

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MTL. Beach leveling is unnecessary and kills any incipient vegetation. Likewise scraping of minor sargassum accumulations should not occur. Left alone, it will quickly dry out and blow inland where it serves as a nutrient to the natural dune vegetation.

In summary, I strongly object to moving any sand in the seaward direction from any location on the beach or from within the dunes. If sand and/or Sargassum must be moved, it should be moved only in a landward direction and used to further strengthen our Natural Dune Seawall to protect the property behind that dune ridge. This takes no public money and provides better storm protection than costly and unsightly engineered structures.

Since this permit will enable the City, in its beach maintenance operations, to do permanent damage to the dunes by inhibiting their natural growth, I would like to request that the Corps hold a public hearing and require a full EIS.

This is my area of expertise. I have over 40 years of continuing studies of the Texas coast and its natural processes. Further information can be found at the following website. This includes photos of the City removing thousands of dump trucks of sand from the upper beach and depositing it in the water.

http://texascoastgeology.com/pabeach/naturalduneseawall.html

Thank you very much for your consideration.

Sincerely,

Richard L. Watson

Richard L. Watson, Ph.D., PG
http://TexasCoastGeology.com

The following link is the permit application.
http://www.swg.usace.army.mil/reg/notice/PN2007-1847.pdf

The plans associated with this application can be found at the following link.
http://www.swg.usace.army.mil/reg/notice/2007-1847.pdf

Enclosures:

McKenna Report - STRATEGIES FOR MANAGING SEDIMENT ON PUBLIC BEACHES CITY OF PORT ARANSAS, TEXAS

Fax Recd 12/20/07

DEC 26 2007

TEXAS PARKS & WILDLIFE

December 21, 2007

Mr. Matthew Kimmel
Regulatory Branch, CESWG-PE-RC
U.S. Army Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

Mr. Mark Fisher, 401 Coordinator
Mail Code 150
TCEQ
P.O. Box 13087
Austin, Texas 73711-3087

Re: Permit Application Number SWG-2007-1847
City of Port Aransas

Texas Parks and Wildlife Department has reviewed permit application number SWG-2007-1847, dated November 30, 2007. The applicant proposes to conduct beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, etc.) from the public beach. The applicant proposes to conduct "be ach grooming" by moving sand from above the annual high tide line (HTL) and placing it on the beach between HTL and the mean high tide line (MTL), repositioning sand from the toe of the dune line to just above HTL for beach roadway maintenance, temporarily removing sargassum, and conducting leveling below MTL. The project is located along a 7-mile stretch of the Gulf of Mexico at Port Aransas Beach, within the City of Port Aransas, Nueces County, Texas.

Beaches are a highly dynamic and valuable habitat for wildlife along the south Texas coast. Beaches provide foraging and shelter for numerous species of shorebirds, wading birds, and crustaceans. Several species of endangered sea turtles come ashore and nest along south Texas beaches. Currently, erosion is the most critical issue facing Texas beaches. Beaches erode due to natural processes (wind and wave action, longshore sediment transport) as well as anthropogenic pressures (vehicular traffic, dune encroachment, and alteration of sediment transport processes). Sand dune complexes counteract erosion by widening and building the beach. Dunes also protect barrier island communities from storm surge. Beach accretion is dependent on the continued function of the dunes and the presence of sand stabilizers, such as sargassum mats that wash up along the shore. In addition to slowing natural beach erosion, sargassum mats are critical foraging habitat for many wading birds and shorebirds, including the endangered Piping Plover.

On page 1 of the public notice, the applicant proposes to remove all non-natural material from the beach and place it in an off-site sanitary landfill. The applicant should specify removal method (manual or mechanical) and equipment. Mechanical removal could negatively impact feeding and foraging of shorebirds, in addition to posing a threat to nesting sea turtles. Sea turtles nest during the day and night, depending on species. Female turtles coming ashore to nest are sensitive to disturbance and grooming activities could prevent them from nesting. In addition, nests below the sand could be impacted or destroyed by the use of a bulldozer or other mechanized equipment.

In order to preserve the aesthetics of the beach, the applicant proposes to move sand from above the annual HTL and place the sand between HTL and MTL. Under natural conditions, sand above the HTL is blown back into the toe of the dune, thereby nourishing the dunes and increasing dune growth. If this sand is removed and placed below the HTL, the sand may be washed into the water, and lost to longshore sediment transport. This may cause the beach to erode faster. In addition, placement of sand could cover sea turtle nests in the area. This could cause eggs not to hatch or prevent hatchlings from leaving the nest.

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This type of grooming is purely for aesthetics, can damage natural resources, and should be removed from the permit application.

The applicant has also proposed to reposition sand from the toe of the dune to just above HTL. Removing sand from the toe of the dune will affect decrease the amount of sand available to the dunes, and could affect dune growth. The applicant should describe what equipment will be used in addition to how sand will be repositioned relative to the toe of the dune.

On page 2 of the public notice, the applicant has proposed to temporarily remove sargassum located between HTL and below MTL and place it into beach maintenance storage areas until it has degraded. Sargassum, while sometimes viewed as an inconvenience by beachgoers, serves an important ecological function. Sargassum that washes ashore serves as a stabilizer for the constantly eroding beach. Sargassum mats act as a stabilizer for the beach by preventing sand in the surf zone from being lost to longshore sediment transport. This aids beach accretion. Also, sargassum mats on the shore are covered by sand in high tide and helps to build the beach up faster. In addition to erosion control, sargassum also provides habitat for numerous invertebrates and vertebrate species. As sargassum washes ashore, it becomes a critical forage area for many species of wading birds and shorebirds, including piping plovers. TPWD recommends that sargassum mats be left in place on the beach. Non-natural items can be removed manually from sargassum to avoid hazards to humans.

The activities proposed by the applicant have the potential to negatively impact the beach ecosystem. Indirect impacts, such as increased beach erosion, as well as direct impacts, such as harassing or harming sea turtles and turtles nests, should be addressed by the applicant prior to agency review. Also, the applicant should specifically describe what equipment is to be used in removal/repositioning, as well as frequency and duration of beach maintenance activities. TWPD cannot fully review this permit until the applicant addresses these issues.

TPWD recommends that the Corps not issue this permit as currently proposed. The applicant should consult with resource agencies, revise the current permit plans and resubmit the application to the USACE.

Questions can be directed to Erin McCarthy (361-825-3204) in the Corpus Christi office or Jamie Schubert (281-534-0135) in the Dickinson office.

Sincerely,

Rebecca Hensley
Regional Director
Coastal Fisheries Division

RH:WJS:EMM

Coastal Coordination Council

P.O. Box 12873 ♦ Austin, Texas 78711-2873 ♦ (800) 998-4GLO ♦ FAX (512) 475-0680

December 21, 2007

Ms. Chemaine Sahadi Koester
Shiner Moseley and Associates Inc
555 North Carancahua Street, Suite 1650
Corpus Christi Texas 78478-0010

Re: Corps of Engineers Permit Application No. SWG-2007-1847
City of Port Aransas
CMP#: 08-0039-F1

Dear Ms. Koester:

Pursuant to Section 506.20 of 31 TAC of the Coastal Coordination Act, the project referenced above has been reviewed for consistency with the Texas Coastal Management Program (CMP).

Based on information you have supplied regarding the project referenced above, it has been determined that this project is above the Texas Commission on Environmental Quality (TCEQ) thresholds for referral to the Coastal Coordination Council (CCC). The TCEQ will be solely responsible for determining the project's consistency with the goals and policies of the CMP. This determination will accompany TCEQ's Section 401 certification for the permit referenced above.

Sincerely,

Tammy Sue Brooks

Tammy S. Brooks
Consistency Review Coordinator
Texas General Land Office

cc: Matthew Kimmel, COE
Michelle Horrocks, TCEQ
Manuel Freytes, GLO Field Service
GLO PSC Lower Coast

Port Aransas Beach Permit

Kimmel, Matthew L SWG

From: Johnny French [jfrench@stx.rr.com]
Sent: Tuesday, December 25, 2007 5:48 PM
To: Kimmel, Matthew L SWG
Cc: Mullins, Henry L SWG; Pat Clements; Mary Orms; Jim Shiner; Jim Suydam; William Kopecky; Vicki Harraghy; Tyler Thorsen; Teresa Carrillo; Roy's Bait & Tackle; Richard Watson; Pat Suter; Noneita West; NICK MEYER; Neil McQueen; Michael McCutchon; Lois Huff; Johnny French; John Sullivan; John S. Adams; John Kelley; Joe Lynch; Joan Vieth; Jim Needham; Gretchen Ray; Ellis Pickett; David Sikes; David Ryan; Craig Harris; Charles Cox; Carolyn Moon; Carlos Truan; Carl R. Codney; Camest West; C.H. Givens; Bruce Laser; Brandi Williams; Betsy A. Churgai; Barb Reynolds; Anne Benning; Mark Crider; Bill Kelly; Henry Garrett; John Marez; Larry Elizondo, Sr.; Melody Cooper; Mike Hummell; Nelda Martinez; Priscilla Leal; Murphy, Carolyn E SWG; Jennifer Smith-Engle; Chuck Cazalas; Chirinos, Fanny; Beth Wilson; Ray Allen
Subject: Additional Comments on PNs SWG-2007-1847 & 24192
Attachments: ATT122528.txt; ATT122529.txt; ATT122530.txt

Dear Mr. Kimmel,

Allow me to add a couple of attachments to my December 23, 2007 email (copy below) commenting on Public Notices SWG-2007-1847 and 24192. These attachments are copies of a series of emails which provide general background for the concerns previously expressed and elaborate on the beach grooming symposium mentioned. The added information was discussed at and shortly following the October 9, 2007 meeting of Coastal Bend Bays Foundation. Please make the contents of the attachments part of the administrative record of the permit applications and consider them as part of the Corps' decision-making process.

Thank you,

Johnny French
----- Original Message -----
From: Johnny French
To: Kimmel, Matthew L SWG
Cc: Lloyd Mullins ; Pat Clements ; Mary Orms ; Jim Shiner ; Jim Suydam ; William Kopecky ; Vicki Harraghy ; Tyler Thorsen ; Teresa Carrillo ; Roy's Bait & Tackle ; Richard Watson ; Pat Suter ; Noneita West ; NICK MEYER ; Neil McQueen ; Michael McCutchon ; Lois Huff ; Johnny French ; John Sullivan ; John S. Adams ; John Kelley ; Joe Lynch ; Joan Vieth ; Jim Needham ; Gretchen Ray ; Ellis Pickett ; David Sikes ; David Ryan ; Craig Harris ; Charles Cox ; Carolyn Moon ; Carlos Truan ; Carl R. Codney ; Camest West ; C.H. Givens ; Bruce Laser ; Brandi Williams ; Betsy Churgai ; Barb Reynolds ; Anne Benning ; Mark Crider ; Michael McCutchon ; Bill Kelly ; Henry Garrett ; John Marez ; Larry Elizondo, Sr. ; Melody Cooper ; Mike Hummell ; Nelda Martinez ; Priscilla Leal ; Carolyn E. Murphy ; Jennifer Smith-Engle ; Chuck Cazalas ; Chirinos, Fanny ; Beth Wilson ; Ray Allen
Sent: Sunday, December 23, 2007 4:45 PM
Subject: Comments on PNs SWG-2077-1847 & 24192

Dear Mr. Kimmel,

These are my comments on the applications by the Cities of Port Aransas and Corpus Christi for Department of the Army 10/404 permits SWG-2007-1847 and 24192, respectively to maintain and groom the beaches of Mustang and North Padre Islands. Comments on the latter application were also sent to you previously via email (copy attached) dated May 24, 2006.

My 2006 comments relating to the biological impacts of the proposed activities obviously apply to the application for SWG-2007-1847 as well, but I must add that in recent months concerns have been publicly expressed over the possibility that sequestering sargassum in stockpiles instead of letting it dry *in situ* on the beach, decompose, and be scattered by the winds over the terrestrial as well as the aquatic environments of the barrier islands may adversely modify the natural fertilization processes at work which sustain the vegetation holding the dunes and the rest of the sandy portions of the island in place. This and other issues about beach grooming, its impacts, alternatives and mitigation are to be the subjects of a symposium being planned for 2008, likely in May. One of the possible features of the symposium would be a demonstration of various techniques and equipment for removing and separating seaweed and other debris from the sand, then restoring the adjacent beach and dune faces.

It has also been suggested that several of the grooming methods for which the applicants seek Corps of Engineers (Corps) authorization are in part physically responsible for the ongoing erosion of the beaches they wish to maintain. Unless the Corps has seen evidence that each of the proposed grooming methods do not contribute to the cumulative effects of beach erosion caused by subsidence, sea level rise, seawalls, jetties and dams, it should hesitate to authorize them. No doubt the Corps' own studies of the effects of its civil works on coastal erosion has shed some light on the dangers of proceeding without assurances that the methods are at least benign. The symposium mentioned above would provide an opportunity for the applicants, the Corps, and the public to discuss and possibly to observe alternatives in addition to the ones proposed for beach grooming, and should be used as a source of additional information before deciding to issue these and similar permits.

Cumulative impacts were among my major concerns regarding beach grooming in May 2006. One of the specific issues, the concentration of human uses on the south end of Mustang Island by a City of Corpus Christi ordinance, was mooted by a public vote in November 2006. However, by authorizing the addition of 7 miles of beach via permit SWG-2007-1847, the cumulative impact of the two proposed permits would now cover almost every bit of gulf beach in Nueces County, including all the piping plover and sea turtle habitat that entails. The formal Endangered Species Act (ESA) consultation I recommended last year for Corpus Christi's permit is still on-going, and now must consider the cumulative effects of authorizing that extra 7 miles. Furthermore, that expanded consultation, always requiring the use of the best scientific information available, should also recognize and take into account the physical impacts to the barrier island mentioned above, and it would accordingly be wise to incorporate new methods and technologies such as those proposed for demonstration at the symposium. If possible, the completion of the consultation should be delayed until after the symposium. Otherwise, the consultation may have to be reinitiated within months.

The other significance of adding the two cities' applications together is that their effect becomes significant in the sense recognized under the guidelines of the National Environmental Policy Act. Adding the effects of just the two permit authorizations may well be enough to trigger the requirement for an Environmental Impact Statement (EIS), but, when one considers that these permits and their ESA consultation become precedents for other beach grooming actions along the Texas coast, that requirement is unavoidable. I therefore recommend the Corps prepare an EIS for beach grooming, rather than continue to consider beach grooming piece-meal.

To facilitate the beach grooming EIS, the Corps should consider coordinating at least one of its associated public hearings with the beach grooming symposium, perhaps even becoming one of its sponsors. If the Corps declines to prepare the EIS and to issue the two permits, it should at least include conditions requiring substantial monitoring of beach erosion and biological impacts, and also include adaptive management conditions taking the monitoring results into account.

Sincerely,

Johnny French

Kimmel, Matthew L SWG

From: Kraus, Nicholas C ERDC-CHL-MS
Sent: Tuesday, December 25, 2007 8:26 PM
To: Kimmel, Matthew L SWG
Cc: Anthamatten, Fred L SWG; Murphy, Carolyn E SWG
Subject: FW: Comments on PNs SWG-2077-1847 & 24192
Attachments: PermitApplication24192.zmc

Hello Matthew,
I know that the permit process does not call for the research arm of the Corps, On the other hand, this is a tricky issue, I believe. If you need assistance, I am familiar with the area and can come up to speed on beach grooming issues.

Nick Kraus

From: richard@texascoastgeology.com [mailto:richard@texascoastgeology.com]
Sent: Sunday, December 23, 2007 6:05 PM
To: Undisclosed-Recipient:;
Subject: Fw: Comments on PNs SWG-2077-1847 & 24192

Johnny French's comments to the Corps of Engineers on the applications from the City of Port Aransas and the City of Corpus Christi for beach grooming permits.

Richard L Watson, Ph.D., PG
http://TexasCoastGeology.com

----- Original Message -----
From: Johnny French

Sent: Sunday, December 23, 2007 4:45 PM
Subject: Comments on PNs SWG-2077-1847 & 24192

Dear Mr. Kimmel,

These are my comments on the applications by the Cities of Port Aransas and Corpus Christi for Department of the Army 10/404 permits SWG-2007-1847 and 24192, respectively to maintain and groom the beaches of Mustang and North Padre Islands. Comments on the latter application were also sent to you previously via email (copy attached) dated May 24, 2006.

My 2006 comments relating to the biological impacts of the proposed activities obviously apply to the application for SWG-2007-1847 as well, but I must add that in recent months concerns have been publicly expressed over the possibility that sequestering sargassum in stockpiles instead of letting it dry *in situ* on the beach, decompose, and be scattered by the winds over the terrestrial as well as the aquatic environments of the barrier islands may adversely modify the natural fertilization processes at work which sustain the vegetation holding the dunes and the rest of the sandy portions of the island in place. This and other issues about beach grooming, its impacts, alternatives and mitigation are to be the subjects of a symposium being planned for 2008, likely in May. One of the possible features of the symposium would be a demonstration of various techniques and equipment for removing and separating seaweed and other debris from the sand, then restoring the adjacent beach and dune faces.

It has also been suggested that several of the grooming methods for which the applicants seek Corps of Engineers (Corps) authorization are in part physically responsible for the ongoing erosion of the beaches they wish to maintain. Unless the Corps has seen evidence that each of the proposed grooming methods do not contribute to the cumulative effects of beach erosion caused by subsidence, sea level rise, seawalls, jetties and dams, it should hesitate to authorize them. No doubt the Corps' own studies of the effects of its civil works on coastal erosion has shed some light on the dangers of proceeding without assurances that the methods are at least benign. The symposium mentioned above would provide an opportunity for the applicants, the Corps, and the public to discuss and possibly to observe alternatives in addition to the ones proposed for beach grooming, and should be used as a source of additional information before deciding to issue these and similar permits.

Cumulative impacts were among my major concerns regarding beach grooming in May 2006. One of the specific issues, the concentration of human uses on the south end of Mustang Island by a City of Corpus Christi ordinance, was mooted by a public vote in November 2006. However, by authorizing the addition of 7 miles of beach via permit SWG-2007-1847, the cumulative impact of the two proposed permits would now cover almost every bit of gulf beach in Nueces County, including all the piping plover and sea turtle habitat that entails. The formal Endangered Species Act (ESA) consultation I recommended last year for Corpus Christi's permit is still on-going, and now must consider the cumulative effects of authorizing that extra 7 miles. Furthermore, that expanded consultation, always requiring the use of the best scientific information available, should also recognize and take into account the physical impacts to the barrier island mentioned above, and it would accordingly be wise to incorporate new methods and technologies such as those proposed for demonstration at the symposium. If possible, the completion of the consultation should be delayed until after the symposium. Otherwise, the consultation may have to be reinitiated within months.

The other significance of adding the two cities' applications together is that their effect becomes significant in the sense recognized under the guidelines of the National Environmental Policy Act. Adding the effects of just the two permit authorizations may well be enough to trigger the requirement for an Environmental Impact Statement (EIS), but, when one considers that these permits and their ESA consultation become precedents for other beach grooming actions along the Texas coast, that requirement is unavoidable. I therefore recommend the Corps prepare an EIS for beach grooming, rather than continue to consider beach grooming piece-meal.

To facilitate the beach grooming EIS, the Corps should consider coordinating at least one of its associated public hearings with the beach grooming symposium, perhaps even becoming one of its sponsors. If the Corps declines to prepare the EIS and to issue the two permits, it should at least include conditions requiring substantial monitoring of beach erosion and biological impacts, and also include adaptive management conditions taking the monitoring results into account.

Sincerely,

Johnny French

From: richard@texascoastgeology.com [mailto:richard@texascoastgeology.com]
Sent: Tuesday, December 25, 2007 8:16 PM
To: Undisclosed-Recipient:;
Subject: Fw: sargassum success

----- Original Message -----
From: Johnny French

Subject: Re: sargassum success

Fred, I concur strongly that the symposium needs to be held soonest. John, as Tony Amos' data shows, while the bulk of the weed appears on our beaches from April through July, there is no time of the year that at least small amounts would not be available with which to test the machinery.

There are other considerations, too. Sea turtle nesting begins in April, and it is important that we see the demonstrations before then in case there is an opportunity to get new equipment or to teach the City crews to operate the front-end loaders and dump trucks in current use differently. The beaches will also be less crowded with people in late winter than in July, and yet not so miserably hot and damp that symposium attendees would avoid the field demos.

Jay Reining dodged my question at the end of the forum about the status of the Corps permit for the City's unauthorized beach grooming within Corps jurisdiction, i.e., below the mean high tide line as Richard Watson described in his talk. Someone, apparently either from the City or a consultant working toward that permit, told me afterword they were working very hard on the conditions necessary to protect the turtles and piping plovers. I was very surprised to learn from Tony that during the associated ESA consultation no one had contacted him about his decades of observations of weed, trash, turtles, and shorebirds, and I urged him to contact the FWS to offer his assistance ASAP. Tom Shearer, please remind Mary Orms that Tony is a major resource of the best scientific information available to her for the BO.

From what several of the forum speakers said and showed in their slides, the beach cleaning adversely alters the slope of the beach, interferes with natural wave and dune processes, and has an unknown effect not only on the food chain of the beach and foredune area, but potentially on all of the inland island ecosystems. This last is because the dried and fragmented weed is normally blown inland like some vast fertilizer application. Equally apparent is that several methods of disposing of the scaped-up sand and weed may violate the Dune Protection Act by covering dune vegetation, and the sharp angles left by accumulations of dumped weed and sand at the dune edge concentrate wave back-wash downward, increasing the rate of erosion of the beach and, eventually, the dunes. Richard showed a couple of ways changing the driving and dumping patterns have reduced beach grooming impacts, both physically and aesthetically.

Several speakers and members of the audience addressed the advantages of leaving the seaweed alone and concentrating instead on hand-picking the other trash and debris. Nobody addressed the other side of beach grooming, in which the purpose is not to clean the beach, but which involves reshaping the beach to make it easier or more difficult to drive upon, depending upon the situation, such as traffic control during events like the C-Sculptures and Beach-to-Bay races. One speaker observed that the alternative of burying the seaweed in the intertidal zone created a serious driving hazard.
----- Original Message -----

From: Fred J. McCutchon

Sent: Wednesday, October 10, 2007 10:36 AM
Subject: RE: sargassum success

The symposium needs to be before March, if possible. I am participating in the ASBPA conference in Galveston Oct. 22-24. We will be considering two model resolutions, one urging the GLO to fund local initiatives to clean the beaches of trash under the Adopt-a-Beach Program, and one to fund new studies on the best practices for approaching sargassum on the beaches. These model resolutions will hopefully be finalized through input from a variety of local government leaders, and are designed for adoption by local govts like Corpus Christi, Nueces County, and so on.

The initial drafts are attached; suggestions welcome.

There are some ideas being discussed for protecting the sand budget (reducing removal of sand) during seaweed removal. However, the presentation last night was informative on the benefits of leaving at least some of the beached sargassum in place. I was disappointed more local officials were not there. Understand Mike being on call. He's informed already. Glad to see Commr. Cazalas and some City & County staff.

TODAY is deadline to submit resume to Judge Loyd Neal for appointment to the Beach Management Advisory Committee. 888-0444 for details.

Frederick J. McCutchon

From: Michael McCutchon [mailto:mmccutch@stx.rr.com]
Sent: Tuesday, October 09, 2007 5:22 PM
To: John Adams; Jeanne Adams; Marie Adams; Clo Allsopp; Pete Allsopp; tony amos; 'James B. Blackburn Jr.'; 'Grady Blount'; Lori Busch; 'Teresa Carrillo'; CGuerra@express-news.net; Pat Clements; Robyn Cobb; CPIZANA@stx.rr.com; 'Claude D'Unger'; flissot@swbell.net; Frank Floyd; joe fox; Johnny French; Roland Gaona; Henry Garrett; Murphy Givens; 'Vicki Harraghy'; 'Lois Huff'; jadams@lighthouse.tamucc.edu; james.needham@tamucc.edu; District33 Ortiz JR; 'John Kelley'; 'William Kopecky'; Joe Lynch; Denise Malan; John Marez; Fred J. McCutchon; 'Neil McQueen'; 'NICK MEYER'; caroyln Moon; Carolyn E SWG Murphy; Dicky Neely; 'Joe Nick Patoski'; 'Ellis Pickett'; 'David Ryan'; 'Rene Saenz'; Cliff Schlarach; 'A. R. Schwartz'; Tom Shearer; 'David Sikes'
Subject: Re: sargassum sucess

I was on call, and missed it. I had asked that city staff be present. Any indication of that? Any report you can give me?

On 10/9/07 4:58 PM, "John Adams" <jsahips@yahoo.com> wrote:

folks, last night at the bays foundation meeting we were exposed to one of the most informative and useful meetings that we have had in a long time.

the presentations were to the point, and all concluded that the method that we are presently using today to "clean" the beach allows for much needed improvements. to that end, we are in the process of organizing a 2-3 day sargassum symposium, perhaps sometime in early june (when the sargassum is abundant). the purpose of the symposium would be to have speakers/presentation from all perspectives of the "cleaning the seaweed off the beach" issue.

please pass this on or reply, to include folks that you think might be an asset to this symposium. as time goes by, we will be soliciting ideas for topics, venue, equipment demonstrations, dates, etc. i hope this will be an all inclusive symposium, touching the scientific, economic, ecological, practical, and aestetic aspects of sargassum removal from our beaches.

thanks

jsa

Kimmel, Matthew L SWG

From:	Kraus, Nicholas C ERDC-CHL-MS
Sent:	Tuesday, December 25, 2007 8:26 PM
To:	Kimmel, Matthew L SWG
Cc:	Anthamatten, Fred L SWG; Murphy, Carolyn E SWG
Subject:	FW: Comments on PNs SWG-2077-1847 & 24192
Attachments:	PermitApplication24192.zmc

Hello Matthew,
I know that the permit process does not call for the research arm of the Corps, On the other hand, this is a tricky issue, I believe. If you need assistance, I am familiar with the area and can come up to speed on beach grooming issues.

Nick Kraus

From: richard@texascoastgeology.com [mailto:richard@texascoastgeology.com]
Sent: Sunday, December 23, 2007 6:05 PM
To: Undisclosed-Recipient:;
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To facilitate the beach grooming EIS, the Corps should consider coordinating at least one of its associated public hearings with the beach grooming symposium, perhaps even becoming one of its sponsors. If the Corps declines to prepare the EIS and to issue the two permits, it should at least include conditions requiring substantial monitoring of beach erosion and biological impacts, and also include adaptive management conditions taking the monitoring results into account.

Sincerely,

Johnny French

12/26/2007

Kimmel, Matthew L SWG

From: Hal Suter [rabblerouser@stx.rr.com]
Sent: Sunday, December 30, 2007 10:52 PM
To: Kimmel, Matthew L SWG
Subject: Beach Access Coalition comments on permitapplication by Port Aransas
Attachments: BAC comments in re P.A..doc

Matthew L. Kimmel SWG

Dear Sir:

Attached you will find the Beach Access Coalition's comments on permit application # SWG-2007-1847 by the City of Port Aransas. Thank you and a Happy New Year to all!

Hal Suter
Chairman
Beach Acess Coaltion
P.O. Box 3512
Corpus Christi, Texas 78404

Matthew L. Kimmel SWG December 30, 2007

Beach Access Coalition Comments on
Permit Application # SWG- 2007-1847
City of Port Aransas

The Beach Access Coalition (BAC) is a coalition of surfers, wind surfers, kite boarders, recreational fishermen, environmentalists, and every conceivable beach user. After defeating an attempt by the City of Corpus Christi to close a section of beach to vehicular access, we have stayed together and remain an advocacy organization for beach goers. We are naturally interested in any action that might impact the public enjoyment of our beaches-both near term and long term.

The BAC has taken no formal position on the application by the City of Port Aransas and ultimately by the City of Corpus Christi to remove and dispose of the sargassum that accumulates on our area beaches, but we do have several questions that we would like to be addressed before a permit is issued

On December 13 John Adams, a member of our organization, attended a meeting with representatives of the City of Corpus Christi, Port Aransas, and the Corps of Engineers. At the meeting Mr. Adams mentioned the fact that the BAC was organizing a symposium on seaweed removal to be held in the spring as "seaweed season" commences. He asked that if the symposium reveals a better method of removal would it be easy and expedient for the applicant(s) to amend the permit to incorporate the better method. He was told that an amendment to a permit would not be difficult to obtain. The BAC would like to formally ask if that assertion is standard operating procedure or not. If a permit has been issued would not the City of Port Aransas, or for that matter Corpus Christi, have to formally apply to amend their permit? If so, does the applicant formally intend to do this? Would this require a majority vote of the City Council? What are the odds of the applicant obtaining a majority vote of the City Council to amend a permit once one has been issued? Finally, how long would the amendment process take? In light of such questions, it might be better to delay the issuance of the permit until it is determined whether or not a better, less beach destructive method of beach grooming is available inasmuch as the symposium will be held in plenty of time for seaweed removal to commence before the major wave of tourism envelops the applicant(s).

The BAC also has questions about the moving of sand. We realize that the days of having to go to the beach with a shovel and a board as necessary equipment to get out of soft sand is a thing of the past, but the current practice of scraping the beach and, in particular, moving the sand seaward appears to be detrimental to the long term health of the beach, especially by changing the beach profile and increasing the prospect of erosion.

The BAC additionally has questions about the proposal to dig a trench in front of the fore dunes to store the removed sargassum and then at some later date put it back in the water. How does this practice affect the dunes? Does the backing and filling have detrimental effects or not? The permit, perhaps because of the newness of the proposal, is rather unclear on how this proposed practice repeated year after year may affect the fore dune ridge.

Because of these questions and others that may arise as this new proposal is implemented the Beach Access Coalition requests that a public meeting be held in order for this and other questions to be addressed It may also be necessary for an EIS to be prepared as well. Thank you.

Hal Suter Cliff Schlabach

Chairman, Beach Access Coalition Co-Chairman,
P.O Box 3512
Corpus Christi, Texas 78404

United States Department of the Interior

JAN 07 2008

Fax Rec'd 12/31/07

FISH AND WILDLIFE SERVICE
Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

December 31, 2007

Matthew Kimmel
Department of the Army
Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411-4318

Consultation No. 21410-2008-I-0099

Dear Mr. Kimmel:

The U.S. Fish and Wildlife Service (Service) has reviewed a Public Notice, dated November 30, 2007, for U.S. Army Corps of Engineers (USACE) and Texas Commission on Environmental Quality (TCEQ) Permit Application SWG-2007-1847. The applicant, City of Port Aransas, requests authorization to conduct beach grooming activities. The project area is along a 7-mile stretch of beach, within the City of Port Aransas, from the southern city limit boundary north to Lantana Drive, in Port Aransas, on Mustang Island, Nueces County, Texas.

This report was prepared under the authority of and in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It represents the coordinated views of the Department of the Interior. The recommendations in this report have been coordinated with representatives of the Texas Parks and Wildlife Department (TPWD), the Texas General Land Office (TGLO), the TCEQ, the National Marine Fisheries Service (NMFS) and the Environmental Protection Agency (EPA).

The applicant proposes to remove non-natural items, such as lumber and plastic bottles, to an off-site sanitary landfill. The applicant proposes to move sand/sargassum from the area between the annual high tide line (HTL) to below the mean high tide line (MTL). The sargassum and associated sand would be placed to storage areas at the base of the foredunes above the HTL and, when degraded, placed in the surf just below the MTL. According to the permit application, storage areas for the sand/sargassum material include: small piles above the HTL at the base of the foredunes on accreting beaches; within troughs behind the foredunes; and in areas behind the main dune line. Also the applicant proposes to conduct the following sand repositioning activities: movement of sand from above the HTL to between the HTL and the MTL; movement of sand from the toe of the dune line to just above the HTL; and movement of sand and leveling of the beach below the MTL. According to the permit application the purpose of the proposed activities is for beach grooming to preserve the aesthetics of the beach.

The Service is concerned about the impacts of the proposed work on federally listed threatened and endangered species, including nesting sea turtles and wintering piping plovers; the impacts of the movement of sand and sargassum on foraging shorebirds; the impacts of the deposition and removal of material in the sand dunes on wildlife, including nesting birds; and the impacts of the proposed movement of materials to and from the beach on natural erosion and accretion processes.

The description of the applicant's proposed work, as outlined in the permit application lacks a number of details that the Service needs to appropriately assess the potential impacts of the proposed work and to develop comprehensive recommendations for the application. The Service recommends that the applicant provide to the Service and the other resource agencies the following information:

1. Identify, in detail, the equipment and methodology proposed to be used for the removal of debris, relocation of sargassum, and movement of sand.

2. Outline the frequency and timing of the proposed activities, both throughout the year, and during the day.

3. Identify the datum used to define the HTL and the MTL.

4. Identify the areas, within the 7-mile long project area, referenced as "accreting beaches" in the permit application and the methodology used to characterize portions of the beach as accreting or otherwise; that is, stable or eroding.

5. Provide the locations and sizes, within the 7-mile long project area, of the proposed sargassum placement sites.

6. Explain the methodology to be utilized for determining the desired state of degradation of sargassum that would require the placement of sargassum material into the surf.

7. Given the potential for significant impacts of the proposed work, provide an explanation as to the need, as identified in the permit application, for the work "to preserve the aesthetics of the beach".

8. Provide an alternatives analysis that assesses the proposed project actions, other alternatives for the proposed activities, and the impact of all the alternatives on shoreline erosion throughout the project area as well as on the shoreline south of the project area.

A Bureau of Economic Geology Study (Gibeaut et al. May 2001) reported that Mustang and North Padre Island Gulf shorelines are, for a variety of reasons, undergoing long term retreat. Coastal erosion is an issue of high concern for the State of Texas as evidenced by the authorization and funding of the Coastal Erosion Planning and Response Act (CEPRA) by the 76th Texas Legislature. The actions proposed by Permit Application SWG-2007-1847 include altering the shoreline profile over a significant distance, potential compaction with heavy equipment, and relocation of sand from the dunes that could disrupt the protective function of the dunes on Mustang Island, and the placement of material into the surf zone where wave action could result in the material being lost.

Permit Application SWG-2007-1847, page 3, notes that consultation with the U.S. Fish and Wildlife and/or the National Marine Fisheries Service will be initiated to assess the effect on endangered species. Section 7 of the Endangered Species Act (ESA) requires that all Federal agencies consult with the Service to ensure that actions authorized, funded or carried out by such agencies do not jeopardize the continued existence of any listed threatened or endangered species or adversely modify or destroy critical habitat of such species. *It is the responsibility of the Federal action agency to determine if the proposed project may affect threatened or endangered species.* If a "may affect" determination is made, the Federal agency shall initiate the formal section 7 consultation process by writing to: Field Supervisor; U.S. Fish and Wildlife Service; c/o TAMU-CC, Campus Unit 5837; 6300 Ocean Drive; Corpus Christi, Texas 78412-5837. Permit Application SWG-2007-1847 does not indicate if components of the project identified in the permit application may have already been undertaken. The ESA has no provision for after-the-fact consultation or eliminating any section 9 liabilities for take that may have occurred in the past. Therefore, consultation is for future activities and the Service recommends that no beach maintenance be undertaken until consultation has been concluded. Enclosed is a list of Federally-listed threatened or endangered species for Nueces County, Texas

Non-federal representatives (i.e. consultants, state agencies, county or local officials) may request and receive species lists, prepare environmental documents, biological assessments, and provide information for formal consultations. However, the Service requires the action agency, in this case the USACE, to designate the non-federal representative in writing. If not designated, we recommend non-federal representatives provide a complete record of their evaluation to the USACE so that they may make a determination of effect and, if necessary, consult with this office on the proposed action.

The Service recommends the USACE and/or non-federal representative maintain a complete record that identifies steps leading to the determination of effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles. The Service's Consultation Handbook is available at http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm for further information on definitions and process.

The State of Texas protects certain species. Please contact the Texas Parks and Wildlife Department (Endangered Resources Branch), Fountain Park Plaza Building, Suite 100, 3000 South IH-35, Austin, Texas 78704 (telephone 512/912-7011) for information concerning fish, wildlife, and plants of State concern or visit their website at http://www.tpwd.state.tx.us/nature/endang/animals/mammals/.

The Service recommends that:

1. Permit Application SWG-2007-1847 not be authorized as proposed,
2. The applicant provide to the Service and other resource agencies the information identified in items 1 through 8 above,

3. The scope and location of current, or past, beach maintenance work undertaken by the applicant be provided to the USACE and the resource agencies,
4. The Service recommends that no beach maintenance be undertaken until consultation has been concluded,
5. The USACE proceed with consultation with the Service and NMFS, including the development of a biological assessment for Permit Application SWG-2007-1847, and
6. The applicant develops an alternatives analysis which examines short term and long-term impacts of beach maintenance as well as less damaging alternatives.

Sincerely,

E. Dawn Whitehead

for Allan M. Strand
Field Supervisor

Enclosures
cc:
R. Swafford, Habitat Conservation Division, NMFS, Galveston, TX
J. Herrington, Federal Activities Branch (6E-F), EPA, Dallas, TX
E. McCarthy, TPWD, Corpus Christi, TX
J. Shubert, TPWD, Dickinson, TX
M. Freytes, Field Operations, TGLO, Corpus Christi, TX
T. Brooks, Texas General Land Office, Coastal Mgmt. Div., Austin, TX
M. Fisher, 401 Coordinator, TCEQ, Austin, TX

Federally Listed as Threatened and Endangered Species of Corpus Christi Ecological Services Field Office Area of Responsibility August 20, 2007

DISCLAIMER

County-by-County lists containing species information is available at the U.S. Fish and Wildlife Service's (Service), Southwest Region, web site http://ifw2es.fws.gov/endangeredspecies/lists/. This list is based on information available to the Service at the time of preparation. This list is subject to change, without notice, as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project.

Candidate Species and Species of Concern currently have no legal protection under the Endangered Species Act. However, they may be protected under other Federal and/or State laws. If you find you have potential project impacts to these species the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.

Migratory Species Common to many or all Counties: Statewide or area-wide migrants are not included by county, except where they breed or occur in concentrations. Species listed specifically in a county have confirmed sightings. If a species is not listed they may occur as migrants in those counties.

Least tern	(E ~)	*Sterna antillarum*
Whooping crane	(E w/CH)	*Grus americana*
Piping plover	(T w/CH)	*Charadrius melodus*
Loggerhead shrike	(SOC)	*Lanius ludovicianus*
White-faced ibis	(SOC)	*Plegadis chihi*

Nueces County

Gulf Coast jaguarundi	(E)	*Herpailurus yagouaroundi cacomitli*
Ocelot	(E)	*Leopardus pardalis*
Brown pelican	(E)	*Pelecanus occidentalis*
West Indian manatee (=Florida)	(E)	*Trichechus manatus*
Hawksbill sea turtle	(E w/CH‡)	*Eretmochelys imbricata*
Kemp's Ridley sea turtle	(E)	*Lepidochelys kempii*
Leatherback sea turtle	(E w/CH‡)	*Dermochelys coriacea*
Slender rush-pea	(E)	*Hoffmannseggia tenella*
South Texas ambrosia	(E)	*Ambrosia cheiranthifolia*
Piping plover	(T w/CH)	*Charadrius melodus*
Green sea turtle	(T w/CH‡)	*Chelonia mydas*
Loggerhead sea turtle	(T)	*Caretta caretta*
Audubon's oriole	(SOC)	*Icterus graduacauda audubonii*
Black rail	(SOC)	*Laterallus jamaicensis*
Black tern	(SOC)	*Chlidonias niger*
Cerulean warbler	(SOC)	*Dendroica cerulea*
Ferruginous hawk	(SOC)	*Buteo regalis*
Loggerhead shrike	(SOC)	*Lanius ludovicianus*
Northern gray hawk	(SOC)	*Buteo nitidus maximus*

JAN 0 7 2008

Reddish egret	(SOC)	*Egretta rufescens*
Sennett's hooded oriole	(SOC)	*Icterus cucullatus sennetti*
Texas Botteri's sparrow	(SOC)	*Aimophila botterii texana*
Texas olive sparrow	(SOC)	*Arremonops rufivirgatus rufivirgatus*
White-faced ibis	(SOC)	*Plegadis chihi*
Black-spotted newt	(SOC)	*Notophthalmus meridionalis*
Rio Grande lesser siren	(SOC)	*Siren intermedia texana*
Gulf salt marsh snake	(SOC)	*Nerodia clarkii*
Texas diamondback terrapin	(SOC)	*Malaclemys terrapin littoralis*
Texas horned lizard	(SOC)	*Phrynosoma cornutum*
Maritime Texas pocket gopher	(SOC)	*Geomys personatus maritimus*
Lilia de los llanos	(SOC)	*Echeandia chandleri*
Roughseed sea-purslane	(SOC)	*Sesuvium trianthemoides*
Texas windmill-grass	(SOC)	*Chloris texensis*
Thieret's skullcap	(SOC)	*Scutellaria thieretii*
Welder machaeranthera	(SOC)	*Psilactis heterocarpa*
Maculated manfreda skipper	(SOC)	*Stallingsia maculosus*

JAN 0 2 2008

COASTAL BEND GROUP
SIERRA CLUB
P.O. BOX 3512
CORPUS CHRISTI, TX 78404

December 29, 2007,

Comments on Permit Application No. SWG-2007-1847
City of Port Aransas

These comments are being sent on behalf of the Coastal Bend Sierra Club and the Coastal Bend Environmental Coalition with a membership of about 2000.

We believe that the practice of using bulldozers to clean the beaches is detrimental to both the beaches and the animals that live in the top layers of sand. Scraping the beach with bulldozers changes the profile of the beach and increases the chance of erosion.

We ask that the COE perform a comprehensive study (an EIS) of the effects of these practices on the beaches of Nueces County. The beaches are an ecological and economic plus for the county and the cumulative effects of the current and proposed practices should be known. We also ask for an public hearing to address all the aspects of the proposed cleaning methods at the beach of Port Aransas.

Sincerely,

Patricia H. Suter

Patricia H. Suter, chairman Sierra Club
President, Environmental Coalition

JAN 07 2008

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

December 21, 2007

Mr. Matthew Kimmel
Regulatory Branch, CESWG-PE-RCC
U.S. Army Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

Re: Project review under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities Code of Texas

Beach Maintenance, City of Port Aransas. COE Permit Application SWG-2007-1847 COE-VD

Dear Mr. Kimmel:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed federal undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission. As the state agency responsible for administering the Antiquities Code of Texas, these comments also provide recommendations on compliance with state antiquities laws and regulations.

The review staff, led by State Marine Archeologist Steven D. Hoyt, has reviewed the information regarding this project. The project description discusses placing sand/sargassum into storage areas within the foredunes (front-stacking, mid-stacking and back-stacking). From the maps provided, archeological site 41NU153, appears to be within the area impacted by the project. 41NU153 is the remains of a Civil War period anti-torpedo raft. The raft is known to be exposed at irregular intervals and the current condition is unknown. Care must be taken, however, to avoid the location of this raft with any heavy equipment or ground disturbing activity.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Steven D. Hoyt at 512/927-7882.**

Sincerely,

Steven D. Hoyt

for F. Lawerence Oaks, State Historic Preservation Officer

cc: Nicole Minnichbach, US Army Corps of Engineers, Galveston District

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 28, 2007

Mr. Matthew Kimmel
U.S. Army Corps of Engineers
Corpus Christi Regulatory Field Office
CESWG-PE-RCC
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

Re: USACE Permit Application Number SWG-2007-1847

Dear Mr. Kimmel:

As described in the Joint Public Notice, dated November 30, 2007, the applicant, City of Port Aransas, proposes to conduct beach maintenance activities associated with beach grooming and the periodic removal of *sargassum* and non-natural items such as trash from the public beach. Trash will be disposed of at an offsite landfill. Sand will be "groomed" by moving it from above the annual high tide line (HTL) with subsequent placement on the beach between HTL and the mean high tide line (MTL). Sand will be repositioned from the toe of the dune line to just above the HTL for beach roadway maintenance. Sand and *Sargassum* will be relocated from areas between the HTL to below the MTL and stored in areas located within the foredunes above HTL. The Texas General Land Office (GLO) issue leases easements for structures and activities located in the foredune area. Once the *Sargassum* material degrades, it is removed from the storage areas and placed in the surf just below the MTL. The sand and degraded *Sargassum* are allowed to redistribute naturally along the shoreline. The *Sargassum* can be placed in three locations within the GLO beach maintenance storage area: front stacking of small piles of sand and *Sargassum* above the HTL at the base of the foredune on accreting beaches only; mid-stacking of small piles of sand and *Sargassum* within troughs behind the foredune on all beaches; and back-stacking of small piles of sand and *Sargassum* in back of the main dune line on all beaches. Beach leveling, sand placement and *Sargassum* collection will be below the MLT. The project is located along a 7-mile stretch of the Gulf of Mexico at Port Aransas Beach, within the City of Port Aransas, Nueces County, Texas.

In addition to the information contained in the public notice, the following information is needed for review of the proposed project. Responses to this letter may raise other questions that will need to be addressed before a water quality certification determination can be made.

1. The grooming of these areas to remove *sargassum* will result in the removal of a significant portion of the organic matter from the beach. Additionally, seaweed removal has been shown in some studies to have strong influences on the community structure and abundance along sandy beaches up to the higher trophic levels such as fish and shorebirds. Removal of the *sargassum* can even have an effect on the spatial distribution of the fauna along the beaches. The applicant should be aware that the

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threatened Piping Plover, *Charadrius melodus* Ord, occurs in the county. Piping plovers feed on small crustaceans, and feed extensively in the piles of *sargassum* along strand lines. Title 30, Texas Administrative Code (TAC), Chapter 279.11(c)(1), states that "No discharge shall be certified if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, ..." Please have the applicant complete and submit the enclosed 401 Tier II Questionnaire and Alternatives Analysis.

2. If the aquatic resources cannot be avoided, appropriate and practicable steps should be taken to minimize potential adverse impacts (279.11(c)(2)). Please have the applicant demonstrate the necessity for the removal of *Sargassum* and how the resulting impacts will be minimized. Examples of minimization may include the timing and spatial extent of beach grooming and *Sargassum* removal.

3. Mitigation of impacts is considered for ". . .all unavoidable adverse impacts that remain after all practicable avoidance and minimization has been completed . . ." (§279.11(c)(3)). No mitigation for impacts resulting from the removal of *Sargassum* has been proposed. Please have the applicant provide a mitigation plan with monitoring requirements and success criteria. If the project is considered self-mitigating, please have the applicant demonstrate how the functions of the wrack will be adequately replaced.

The Texas Commission on Environmental Quality (TCEQ) looks forward to receiving and evaluating other agency or public comments. Please provide any agency comments, public comments, as well as the applicant's comments, to Ms. Lili Lytle of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Lytle may also be contacted by e-mail at *llytle@tceq.state.tx.us*, or by telephone at (512) 239-4596.

Sincerely,

L'Oreal W. Stepney, P.E., Director
Water Quality Division
Texas Commission on Environmental Quality

LWS/LL/ms

Enclosure

cc: Chemaine Sahadi Koester, Shiner Moseley and Associates, Inc., 555 North Carancahua Street, Suite 1650, Corpus Christi, Texas 78478-0010

State Water Quality Certification of Section 404 Permits

Does your project meet Texas' water quality standards?

The Texas Commission on Environmental Quality (TCEQ) must consider this question for all proposed projects seeking a Section 404 dredge and fill permit.

✧✧✧✧✧✧✧✧

One of the requirements for obtaining a Corps of Engineers Section 404 permit is certification from the TCEQ that the permit will comply with State water quality standards. This requirement is authorized by Section 401 of the Federal Clean Water Act, and is therefore referred to as 401 certification.

The attached 401 certification questionnaire must be submitted in order for the TCEQ to determine whether or not a project should be granted 401 certification. Please note that the information requested in this questionnaire is *not* required in order for a Section 404 application to be considered administratively complete by the Corps of Engineers. However, failure to provide this information (including the Alternatives Analysis Checklist) to the TCEQ (within 30 days of the public notice) may cause your project to be denied 401 certification without prejudice.

What do you need to submit to TCEQ?

1. A completed 401 certification questionnaire

2. A completed Alternatives Analysis Checklist (if your project affects surface water in the State, including wetlands)

3. A map with the location of the project clearly marked (A U.S. Geological Survey (USGS) topographic map *strongly recommended*)

4. Photographs or a video cassette showing the project area and any associated disposal areas (Map and photos should be numbered to show where the photos were taken and the area covered by each photo)

What is involved in review of Section 401 certifications?

1. Filing an application with the Corps starts both the 404 permit and the 401 certification processes

2. A Joint Public Notice is issued by the Corps and the TCEQ after receipt by the Corps of a completed application to inform the public and other government agencies of the proposed activity

   - A 30 day comment period follows
   - The TCEQ may hold a public hearing to consider the potential adverse impacts of the proposed project on water quality

3. The TCEQ may request additional information from the application, persons submitting comments or requesting a hearing, or other resource agencies

4. A final 401 certification decision will be provided following the end of the comment period.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Tier II
Alternatives Analysis Checklist

I. Alternatives

A. How could you satisfy your needs in ways which do not affect surface water in the State?

B. How could the project be re-designed to fit the site without affecting surface water in the State?

C. How could the project be made smaller and still meet your needs?

D. What other sites were considered?

1. What geographical area was searched for alternative sites?
2. How did you determine whether other non-wetland sites are available for development in the area?
3. In recent years, have you sold or leased any lands located within the vicinity of the project? If so, why were they unsuitable for the project?

E. What are the consequences of not building the project?

II. Comparison of alternatives

A. How do the costs compare for the alternatives considered above?

B. Are there logistical (location, access, transportation, etc.) reasons that limit the alternatives considered?

C. Are there technological limitations for the alternatives considered?

D. Are there other reasons certain alternatives are not feasible?

III. If you have not chosen an alternative which would avoid impacts to surface water in the State, please explain:

A. Why your alternative was selected, and

B. What you plan to do to minimize adverse effects on the surface water in the State impacted.

IV. Please provide a comparison of each criteria (from Part II) for each site evaluation in the alternatives analysis.

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Tier II
401 Certification Questionnaire

The following questions seek to determine how adverse impacts will be avoided during construction or upon completion of the project. If any of the following questions are not applicable to your project, write NA ("not applicable") and continue.

Please include the applicant's name as it appears on the Corps of Engineers' permit application (and permit number, if known) on all material submitted. The material should be sent to:

Texas Commission on Environmental Quality
Attn: 401 Coordinator (MC-150)
P.O. Box 13087
Austin, TX 78711-3087

I. Impacts to surface water in the State, including wetlands

A. What is the area of surface water in the State, including wetlands, that will be disturbed, altered or destroyed by the proposed activity?

B. Is compensatory mitigation proposed? If yes, submit a copy of the mitigation plan. If no, explain why not.

C. Please complete the attached Alternatives Analysis Checklist.

II. Disposal of waste materials

A. Describe the methods for disposing of materials recovered from the removal or destruction of existing structures.

B. Describe the methods for disposing of sewage generated during construction. If the proposed work establishes a business or a subdivision, describe the method for disposing of sewage after completing the project.

C. For marinas, describe plans for collecting and disposing of sewage from marine sanitation devices. Also, discuss provisions for the disposing of sewage generated from day-to-day activities.

III. Water quality impacts

A. Describe the methods to minimize the short-term and long-term turbidity and suspended solids in the waters being dredged and/or filled. Also, describe the type of sediment (sand, clay, etc.) that will be dredged or used for fill.

B. Describe measures that will be used to stabilize disturbed soil areas, including: dredge material mounds, new levees or berms, building sites, and construction work areas. The description should address both short-term (construction related) and long-term (normal operation or maintenance) measures. Typical measures might include containment structures, drainage modifications, sediment fences, or vegetative cover. Special construction techniques intended to minimize soil or sediment disruption should also be described.

C. Discuss how hydraulically dredged materials will be handled to ensure maximum settling of solids before discharging the decant water. Plans should include a calculation of minimum settling times with supporting data (Reference: Technical Report, DS-7810, Dredge Material Research Program, GUIDELINES FOR DESIGNING, OPERATING, AND MAINTAINING DREDGED MATERIAL CONTAINMENT AREAS). If future maintenance dredging will be required, the disposal site should be designed to accommodate additional dredged materials. If not, please include plans for periodically removing the dried sediments from the disposal area.

D. Describe any methods used to test the sediments for contamination, especially when dredging in an area known or likely to be contaminated, such as downstream of municipal or industrial wastewater discharges.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

January 8, 2008

REPLY TO
ATTENTION OF:

Regulatory Branch

SUBJECT: Permit Application No. SWG-2007-1847

City of Port Aransas
ATTN: Michael Kovacs
710 West Avenue A
Port Aransas, Texas 78373

Dear Mr. Kovacs:

The Corps published a notice on November 30, 2007 to advise the public of your proposed activity. In response, we received the enclosed letters from the U.S. Fish and Wildlife Service, the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, The Texas Historical Commission, Dr. Richard L. Watson and Mr. Johnny French.

The concerns raised in the letters must be given full consideration before we can make a final decision on your application. We need your information to address the concerns/issues raised over the proposed project. You may submit additional information or revise your plans to help resolve the issues. You may also rebut the issues made or request a decision based on the existing record. We must hear from you within 30 days from the date of this letter, otherwise your application will be withdrawn.

We are ready to assist you in whatever way possible. We can even arrange a meeting between you and the concerned parties if that is your desire. Please call me at (361) 814-5847 if you need help.

Sincerely,

Matthew Kimmel
Project Manager

Enclosures

Shiner Moseley and Associates, Inc., ATTN: Chemaine Sahadi Koester
555 N. Carancahua, Suite 1650, Corpus Christi, Texas 78478-0010

HDR | **SHINER MOSELEY AND ASSOCIATES, INC.**

FEB 27 2008

February 26, 2008 66107

Mr. Lloyd Mullins
U.S. Army Corps of Engineers
Corpus Christi Regulatory Branch
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411

RE: RESPONSE TO AGENCY AND PUBLIC COMMENTS FOR U.S. ARMY CORPS OF ENGINEERS APPLICATION NO. SWG-2007-1847 (BEACH MAINTENANCE ACTIVITIES FOR THE CITY OF PORT ARANSAS, MUSTANG ISLAND, NUECES COUNTY, TEXAS)

Dear Mr. Mullins,

I. INTRODUCTION

The purpose of this letter is to provide a response to agency and public comments received during the 30-day Public Notice (PN) period for U.S. Army Corps of Engineers (USACE) Application No. SWG-2007-1847 (Beach Maintenance Activities for the City of Port Aransas, Mustang Island, Nueces County, Texas). During the public comment period, resource agencies and the public raised 26 issues regarding the above project. The following are responses to comments solicited in the PN.

II. BACKGROUND

A meeting to discuss this project was held at the USACE Corpus Christi Regulatory Field Office on June 11, 2007. Meeting attendees included Lloyd Mullins and Matthew Kimmel from USACE, Michael Kovacs and David Parsons from the City of Port Aransas, Jim Urban from Urban Engineering, Inc., and Chemaine Koester of HDR|Shiner Moseley. The initial permit application was submitted to the USACE Corpus Christi Regulatory Office on October 29, 2007. Consequently, the Public Notice for this project was published on November 30, 2007, and comments received from your office on January 8, 2008. Table 1 below summarizes agency and public comments, with many agencies commenting on multiple topics.

Table 1 – Summary of Agencies/Public Issues of Concern

Issue	USFWS	TCEQ	THC	TPWD	Public
1. Endangered species issues.	✓	✓		✓	✓
2. Equipment and methodology for beach maintenance activities.	✓		✓	✓	✓
3. Frequency and timing of proposed beach maintenance activities.	✓	✓		✓	✓

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Table 1 – Summary of Agencies/Public Issues of Concern					
Issue	USFWS	TCEQ	THC	TPWD	Public
4. Recommendation of no beach maintenance work until issuance of permit.	✓	✓		✓	✓
5. Sargassum mats should be left in place on the beach for ecological functions.	✓	✓		✓	✓
6. Beach maintenance practices responsible for beach erosion.	✓	✓		✓	✓
7. Explain the need for work "to preserve beach aesthetics".	✓	✓		✓	
8. Concern with movement of sand from above HTL to between HTL and MTL, and re-positioning of sand from toe of dunes to just above HTL (movement of sand in a seaward direction) due to impact on dunes.	✓			✓	✓
9. Concern with temporary storage of sargassum within beach maintenance storage areas.				✓	✓
10. Identify areas within 7-mile project area referenced as "accreting beaches" and the methods used to categorize these beaches.	✓				
11. Locations and sizes of proposed beach maintenance storage areas.	✓				
12. Methodology for determining desired state of degradation of sargassum that would require placement in the surf zone.	✓				
13. Alternatives analysis.	✓				
14. Scope and location of current and past beach maintenance work.	✓				
15. Identify datum used to define HTL and MTL.	✓				
16. The 401 Tier II questionnaire and alternatives analysis.		✓			
17. Mitigation plan.		✓			
18. Existence of known archeological site within dune area.			✓		
19. Request for public hearing and a full EIS.					✓
20. Cumulative impacts.					✓
21. Research needed on alternative beach maintenance methods and technologies.					✓
22. Will the City have to amend their permit to include alternative beach maintenance methods and activities, should these be available?					✓
23. If so, does the applicant intend to do this?					✓
24. Would this require a majority vote of the City Council?					✓
25. What are the odds of the City obtaining a majority vote from the City Council to amend a permit once it has been issued?					✓
26. How long would the amendment process take?					✓

III. RESPONSE TO COMMENTS

III.1 Endangered Species Issues

As indicated in Permit Application SWG-2007-1847, formal consultation under Section 7 of the Endangered Species Act will be initiated with U.S. Fish and Wildlife Service

(USFWS) and the National Marine Fisheries Service (NMFS) to assess the effect on endangered species within the project area. A Biological Assessment will be developed for submittal to USFWS and NMFS.

The following endangered species are of particular concern within the City of Port Aransas' beach maintenance project area:

Sea Turtles

The City of Port Aransas has no plans to contract with independent turtle patrols on their seven miles of maintained beach. Instead, the City will continue to work in conjunction with existing turtle patrols conducted by representatives from the University of Texas Marine Science Institute (UTMSI). UTMSI conducts volunteer turtle patrols daily from April 1 to mid-July. These patrols are conducted during the daylight hours, from approximately 6:30 am until 6 pm from the Mustang Island State Park north to the northern Port Aransas city limits.

The City of Port Aransas will conduct, in addition to the above mentioned turtle patrols, their own patrols during the workday, looking for both turtles and signs of turtle nesting activity. A Public Works representative will drive each stretch of beach prior to cleaning to look for turtles, turtle tracks, and nests. If a turtle is located, a City Public Works representative will immediately report the siting to either Tony Amos with the UTMSI- ARK program or Donna Shaver with the Padre Island National Seashore (PINS). Beach cleaning activities at turtle siting locations will cease until a scientific permit holder arrives on-site to recover the turtle and its' nest.

City Public Works staff participated in a formal turtle patrol training class on February 20, 2008 with a representative of PINS. A refresher course will be provided to Public Works staff every year prior to turtle nesting season. New employees who are hired on after turtle nesting season will be given a hand-out regarding turtles and required to take the training class during March of the following year.

Piping Plover

Despite minor disturbance from beach maintenance activities, piping plovers have continued to forage on wet beach areas. Clearing of sargassum and other debris from the beach may provide the piping plover with more surface area for foraging, since they prefer to feed on unvegetated areas.

The general length of time the plovers' foraging habitats are indirectly disrupted by maintenance activities (i.e. noise from heavy machinery) in any one priority area ranges from a few hours to approximately 3-4 days, depending upon the amount of sargassum and debris to be removed. For example, in Priority Area A it can take up to 3-4 days to clean after a heavy sargassum event or during heavy pedestrian/vehicle usage. It should be noted that heavy machinery does not remain in a static location within a priority area for more than a short period and is continuously moving down the beach as cleaning is taking place. Piping plovers could be temporarily affected by the noise from machinery and would likely move to an immediately adjacent section of beach during beach maintenance activities, as they do in the case of other common disturbances.

III.2 Equipment and Methodology for Beach Maintenance Activities

Beach maintenance practices are typically used seasonally (April-August), but there is always the occasion that these practices will be needed at other times in the year. For example, sargassum beach cleaning practices have been used in October for the cleaning of tropical storm and hurricane storm debris that washed ashore piles of vegetative material during previous months. Beach maintenance on the roadway can occur at any time, during damaging high water events. Current beach maintenance practices performed by the City of Port Aransas in Priority Areas A, B, and C include:

1. Removal of all non-natural material such as lumber, plastic bottles, cans etc. from the beach to an off-site municipal sanitary landfill. This beach maintenance practice is typically utilized year round;
2. Movement of sand from above the annual High Tide Level (HTL), with subsequent placement on the beach between HTL and Mean Tide Level (MTL). This activity can be described as vehicular travel way maintenance grooming and is conducted to preserve the drivability of the beach. This activity is conducted seasonally but can be conducted during other times of the year if necessary;
3. Re-positioning of sand from the toe of the dune line to just above HTL for beach roadway maintenance. This activity is conducted year-round; mainly during times of drought when the upper reaches of the beach are extremely dried out.
4. Re-location of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located within foredunes above HTL. Once the sargassum material degrades, it is removed from beach maintenance storage areas, and placed in the surf just below MTL. The sand and sargassum is then allowed to re-distribute naturally along the shoreline. This activity is conducted seasonally but can be conducted during other times of the year if necessary. Sargassum material can be placed in three locations within beach maintenance storage areas:
   a. Front stacking of small piles consisting of sand/sargassum above HTL at base of the foredune in accreting beaches only.
   b. Mid-stacking of small piles consisting of sand/sargassum within troughs behind the foredune on all beaches.
   c. Back stacking of small piles consisting of sand/sargassum behind the main dune line on all beaches.
5. Relocation of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into windrows both above

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and below MTL. A motor grader is used to dig a trench and the sargassum windrow is then pushed into the trench and buried. This activity is conducted seasonally but can be conducted during other times of the year if necessary.

6. Conduct leveling of the beach, sand placement, and sargassum collection below MTL. This activity is conducted seasonally but can be conducted during other times of the year if necessary.

A cost evaluation and practicality review were conducted for alternative material placement options. Alternatives reviewed included landfilling, composting etc. These methods were deemed not to be physically, environmentally, or financially feasible.

Type of Equipment Utilized on each Stretch of Beach

Beach maintenance equipment is typically used seasonally (April-August), but there is often the occasion that the equipment can be used at other times of the year if necessary. The following types of equipment are utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August).
- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the roadway area. This equipment is utilized in Priority Areas A, B, and C.
- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C
- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to an approved upland location.
- **Pick-up Trucks-** Pick-up trucks are used to carry beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.
- **Tractor with Rake Attachment** - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc., from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.
- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc., from the beach for disposal in the City's sanitary landfill.
- **Skid-O-Can Pumper Trucks** – This piece of equipment is utilized to remove wastes from skid-o-cans located in Areas A, B, and C.

Beach Maintenance Staff

The City of Port Aransas employs the following Public Works Staff assigned to beach maintenance:

- **Full-time Heavy Equipment Operators (4)** - Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; primarily responsible for removal of sargassum and roadway maintenance.
- **Supervisors (2)** - Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff; Also responsible for running all heavy equipment such as front-end loaders, tractors, and motor.
- **Full-time Ground Custodians (6)** – Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.
- **Skid-O-Kan Operator (1)** - Responsible for maintaining skid-o-kans located on the beach. This includes the removal of waste via a vacuum truck that is driven to each skid-o-kan location.

III.3 Frequency and Timing of Proposed Beach Maintenance Activities

As previously stated, beach maintenance practices are typically used seasonally (April-August), but there is often the occasion that these practices can be used at other times of the year. For example, sargassum beach cleaning practices have been used in October for cleaning up tropical storm and hurricane storm debris that washed ashore piles of vegetative material during previous months. Beach maintenance on the roadway can occur at any time during damaging high water events.

Criteria for Beach Cleaning Selection and Frequency/Timing of Cleaning

The City Manager, in coordination with the Public Works Director, determines when the beaches are cleaned and when vehicular travel ways need maintenance. The City has a three-tiered priority system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order. Descriptions of each beach maintenance priority area are as follows:

- **Priority Area A -** High use areas including those portions of beach located between Lantana Drive south to Beach Access Road 1A. Priority A areas are cleaned and maintained daily first in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day.
- **Priority Area B -** Semi-heavily used areas including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.
- **Priority Area C -** Low use areas including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower. Ground trash is handpicked from Priority C areas every day.

III.4 Recommendation of no Beach Maintenance Work until Issuance of Permit

Texas Statute requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches. The proposed beach maintenance activities are in accordance with the Texas Open Beaches Act to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by the state in order to uphold the Texas Open Beaches Act. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access. Thus, the suggestion that all beach maintenance activities be restricted until after the USACE permit has been issued is unreasonable in that it: 1) would prevent the city from complying fully with the Texas Open Beaches Act, and 2) represents a life safety liability.

The City will conduct beach maintenance practices in accordance with guidelines provided by USACE at a meeting on June 8, 2008. According to information provided by USACE at this meeting, no excavation or fill can occur below MTL (Section 10 boundary line) without a USACE permit. The Corps stated that no fill could occur below HTL (Section 404 boundary line) without a permit; however, excavation of sargassum and a minimal amount of sand (resulting from removal of the sargassum) can be accomplished below HTL, provided that only a minimal amount of sargassum and sand is allowed to fall back into the area of removal. This material must be removed and placed landward of HTL or in some other upland area offsite. Sand cannot be moved around below HTL without a permit since this would be considered fill.

III.5 Sargassum mats should be left in place on the beach for ecological functions

Different types of beach maintenance activities have been conducted along the approximate 7-mile stretch of beach for the past several decades. Relocation of sargassum from the intertidal zone to the base of the dune does not inhibit all ecological function in the way that complete removal of sargassum might, as the relocated sargassum still serves as a source for organic nutrients.

Despite the minor disturbance from beach maintenance activities, organisms such as the piping plover have continued to forage on wet beach areas. Clearing of sargassum and other debris from the beach may provide the piping plover and other organisms with more surface area for foraging, since some organisms, like the piping plover, prefer to feed on unvegetated areas. Formal consultation with USFWS and NMFS has been initiated to assess the effect of beach maintenance activities, including the clearing of sargassum, on endangered species within the project area.

III.6 Beach Maintenance Practices Responsible for Beach Erosion

Based on data provided by the University of Texas Bureau of Economic Geology (UTBEG), the mean high tide is subject to a rate change of -1.2 to +1.3 feet per year. Proposed beach maintenance activities will not adversely affect coastal erosion because the affected sand will remain within the local beach-dune system and special provisions will be taken within eroding areas. Proposed beach maintenance practices will positively impact the public beach by re-nourishing effected and eroding areas. These efforts are designed to strengthen the beach/dune system while actively addressing the need for sargassum maintenance.

III.7 Explain the need for work "to preserve beach aesthetics"

The City is bound by its Coastal Management Plan to protect access to and use of the public beaches (section VIII, B. 3). The City has interpreted this section to maintain trouble-free driving on the beach road (or vehicular travel way) as it has continued this practice for several decades.

The City of Port Aransas is a destination resort that relies heavily on outside tourism to support the local economy. During peak tourist seasons, the Port Aransas population temporarily increases from approximately 3,700 year-round residents to approximately 80,000. Tourists tend to have a certain expectation level for their beach experience than do local residents. Tourists expect safe, clean beaches free of sargassum and other debris and trouble-free access for driving and walking. If beach aesthetics are not preserved to some degree, tourism in Port Aransas is impacted, thereby providing a negative impact on the local economy.

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III.8 Concern with Impacts on Dunes due to Movement of Sand from above HTL to between HTL and MTL and Re-positioning of Sand from Toe of Dunes to just above HTL (Movement of Sand in a Seaward Direction)

Currently, natural sand transport along Padre and Mustang Islands is out of balance. The dune complex is fed by the eolian process whereby sand is washed up on the beach, it dries, some amounts of it are blown by the prevailing winds towards, and into, the dune complex, and in non-storm times, the dunes grow. This eolian process still takes place within the City's current beach maintenance practices. However, dune building in Port Aransas has been accelerated over the last twenty-five years through the City's scraping of the beaches for sargassum control and "front-stacking" the sand/seaweed material on the seaward side of the natural foredune ridge. Instead of dunes naturally building out a foot or so seaward annually, the City's beach maintenance practices can add ten to fifteen feet of dunes in a single season.

TGLO staff (including a coastal geologist) have observed that (through issuance of an approved dune permit to the City) that the city has artificially built out the dune complex (seaward) through the process of "front-stacking" sand and seaweed over the past twenty-five years. In some areas, front stacking has added over 150 feet of dune material seaward of what the TGLO considers the "natural line of vegetation". The area that lies in front of the "natural dune line" is considered a "beach maintenance storage area", and is recognized by TGLO as an area that can be utilized by the local jurisdictions (City or County) for purposes such as temporarily stockpiling sand and/or seaweed for later disposal, in either a landward or seaward direction, whatever may be permitted, (hence, our corps permit for 'seaward' disposal).

As far as dune strengthening, the City's new and continued method of disposal by "mid-stacking" and "rear-stacking" of sand/sargassum, is a method that will out perform nature's eolian processes of dune building. So if calculated overall, there is still an artificial net gain for the dunes, leaving the long shore drift sand at an artificial loss, which in turn, leads to erosion of the beach face. To balance out the sand transport, some sand must be moved (returned) to the waters edge placing it back into the long shore system. The City's maintenance practices should reflect this process of "sand moved landward, must equal, sand moved seaward." Otherwise either the dunes or the beach face will experience erosion and loss of sand.

III.9 Concern with Temporary Storage of Sargassum within Beach Maintenance Storage Areas

Those areas located 20 feet seaward of the projected line of vegetation are classified as beach maintenance storage areas. Temporarily stored material (including sargassum and some residual sand) can be moved within the beach dune system in a manner that does not harm the beach dune system. Any movement of the material should include measures to assure that the dunes remaining are not mechanically weakened.

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III.10 Identify Areas within 7-Mile Project Area Referenced as "Accreting Beaches" and the Methods Used to Categorize these Beaches

The Texas Bureau of Economic Geology (UTBEG) determines shoreline change rates for the Gulf of Mexico and bay beaches. Shoreline change rates are indicators of beach stability and/or erosion and are helpful for planning and managing coastal projects. In the past, the UTBEG has utilized aerial photography combined with beach profiles to determine shoreline changes over a period of time ranging from short-term (1970s to 1980s) to long term (1800s to 1982). Currently, LIDAR (Light Detection and Ranging) surveys and beach profiles are used to measure topography of the beaches and dunes. The BEG compares the elevation information gained from these surveys with historical shorelines to calculate annual rates of shoreline change.

According to the BEG study, the following are the rates of accretion and erosion within the 7-mile project area:

- Southern Port Aransas city limits (located near the La Mirage Condominiums) north to Beach Access Road 1 (approx. 3.5 mi): Variable, from an accretion rate of +1.0 ft./year to an erosion rate of -5.0 ft./year
- Beach Access Road 1 north to just south of Sandcastle Drive (approx. 2.5 mi.): Variable, from an accretion rate of +0.7 ft./year to an erosion rate of -0.4 ft./year
- Just north of Sandcastle Drive to Avenue G (approx. 0.5 miles): Erosion rate of -0.2 ft./year to -1.2 ft./year
- Avenue G to Lantana Drive (near Horrace Coldwell Pier) (approx. 0.5 miles): Variable, from an accretion rate of +1.4 ft./year to an erosion rate of -0.5 ft./year

III.11 Locations and Sizes of Proposed Sargassum Placement Sites (i.e. Beach Maintenance Storage Areas)

Available upland depressions located behind the foredune ridge have the potential to become a beach maintenance storage area. Any sargassum/sand removed from erosional beaches will only be moved duneward from that location along a transect perpendicular to the shoreline; there will be no lateral relocation of sand or sargassum to other places along the beach. Because the "back dune" area landowner will vary (in some cases, the back dune area may be owned by a private landowner instead of by the State), the immediate beneficiary of any relocation of sand/sargassum will also vary. This will occur from Lantana Drive, south, to the City limits.

III.12 Methodology for Determining Desired State of Degradation of Sargassum that would Require Placement in the Surf Zone.

During periods when there is an abundance of material in the dunes, degraded sargassum may be removed from sargassum placement sites and placed in the surf zone

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approximately every six months. The decision to relocate degrading material back into the surf zone will be based on the condition of the dunes. For example, if the dune has been diminished by storms or other erosion forces, sargassum would likely be left in place to augment dune recovery.

III.13 Alternatives Analysis

The only beach maintenance procedures currently practiced by the City are:

- Removal of non-natural material such as lumber, plastic bottles, can, etc., from the beach to an off-site municipal sanitary landfill.
- Movement of sand from above HTL with subsequent placement of the beach between HTL and MTL.
- Re-location of sand/sargassum from areas of the beach located between HTL to below MTL and subsequent placement of this material into beach maintenance storage areas located between the foredunes above HTL.

The disposal of non-natural materials to an off-site municipal landfill is the only off-site alternative currently being considered for beach maintenance and cleaning. The city staff has studied six options for sargassum disposal, ranging from leaving it in place to sifting beach sand out of the sargassum and trucking the sargassum to the Corpus Christi landfill for disposal. The City has determined that at this time, off-site disposal of sargassum and sand into a municipal landfill is physically, financially, and legally impractical (State law prohibits any sand from being removed from a barrier island).

Non-mechanized maintenance of the beach is also not being considered since it is also physically and financially impractical. The type, amount, and nature of the sargassum and flotsam and jetsam occurring on Coastal Bend beaches are such that it makes non-mechanized maintenance of the beach impossible. A cost evaluation and practicality review were conducted for alternative material placement options. Alternatives reviewed included landfilling, composting etc. These methods were deemed not to be physically, environmentally, or financially feasible.

The City is actively looking into alternative beach maintenance methods and technologies including the development/manufacturing of a "super" beach rake and "mesh" front-end loader buckets that would allow sand to fall through them. In addition, the City is looking into creating policies that leave more sargassum on the beach and educating the general public that small amounts of "natural" beach wash-up (sargassum, sticks, organisms, etc.) are beneficial to the environment.

III.14 Scope and Location of Current and Past Beach Maintenance Work

The City currently maintains and has maintained in the past an approximate 7-mile stretch of beach extending from the southern end of the City of Port Aransas City limits north to Lantana Drive. The City has broken up the 7-mile stretch into three priority

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beach maintenance areas: (1) Area A, Lantana to Beach Access Rd 1A, highest maintenance (2) Area B, Beach Access Road 1A to Beach Access Road 1, moderate maintenance and (3) Area C, South of Beach Access Road 1 to southern city limits, lowest maintenance (except for in front of subdivision or condo).

III.15 Identify Datum Used to Define HTL and MTL

The datum used to define HTL and MTL is North American Vertical Datum of 1988 (NAVD'88).

III.16 401 Tier II Questionnaire and Alternatives Analysis

A Tier II Questionnaire and Alternatives Analysis will be submitted to USACE and TCEQ under separate cover.

III.17 Mitigation Plan

The City previously proposed dune mitigation in its Seaweed Maintenance Plan (June 2007). The Seaweed Maintenance Plan was drafted in association with an application for a Dune Permit and Beachfront Construction Certificate. In this Plan, the City states that avoidance and minimization of dunes will be met by not affecting any critical dunes outside the beach maintenance area. Dune vegetation may be temporarily affected by maintenance procedures, but shall be monitored for revegetation. If revegetation does not occur, the City shall be responsible for taking measures to revegetate this area.

Mitigation will take place by spreading sand from the excavated maintenance dune onto the public beach to renourish areas immediately seaward of the affected area, in areas the UTBEG has identified as eroding beaches, or depositing it into approved designated areas.

III.18 Existence of Known Archeological Site within Dune Area

If the Texas Historical Commission can provide the location (lat. and long.) of the remains of the registered Civil War period anti-torpedo craft, the City will attempt to avoid the use of heavy equipment or ground disturbing activity in this area.

III.19 Request for Public Hearing and a Full EIS due to Permanent Damage to the Dunes

A public hearing and full EIS is not warranted. See response in Section III.8

III.20 Cumulative Impacts

The City of Port Aransas and the City of Corpus Christi are two separate entities both bound by independent Coastal Management Plans (CMP) to protect access to and use of their sections of public beaches (section VIII, B. 3). Both Cities have interpreted this section to maintain trouble-free driving on the beach road (or vehicular travel way) as both have continued these practices for several decades.

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Although the combined beach maintenance areas of the Cities of Port Aransas and Corpus Christi comprise a good majority of the Gulf beach in Nueces County, each entity will be authorized to conduct their own beach maintenance practices under separate USACE permits, therefore there is no need for a review of cumulative impacts. In addition, each entity will consult formally with the U.S. Fish and Wildlife Service and National Marine Fisheries Services to establish criteria for the protection of endangered species on their respective stretches of beach.

III.21 Research Needed on Alternative Beach Maintenance Methods and Technologies

The City is continuously looking into alternative beach maintenance methods and technologies including the development/manufacturing of a "super" beach rake and "mesh" front-end loader buckets that allow sand to fall through them. In addition, the City is looking into creating policies that leave more sargassum on the beach and educating the general public that small amounts of "natural" beach wash-up (sargassum, sticks, organisms, etc.) are beneficial to the environment.

III.22 Will the City have to amend their permit to include Alternative Beach Maintenance Methods and Activities, should these be Available?

If the City decided to use alternative beach maintenance activities, other than the methods proposed in the current USACE permit application, the City would have to amend their permit to include alternative methods. At this point, the City is not proposing any alternative methods other than those submitted with the current permit action. However, the City is actively looking into developing/manufacturing a "super" beach rake and "mesh" front end loader buckets that allow sand to fall through them. In addition, they are looking into creating policies that leave more sargassum on the beach and educating the general public that small amounts of "natural" beach wash up (sargassum, sticks, organisms, etc.) are beneficial to the environment. The City is always open to future alternative beach maintenance practices.

III.23 If so, does the Applicant intend to do this?

At this point, the City is not proposing alternative methods other than those submitted with the current permit action. As previously stated, the City is always open to future alternative beach maintenance methods including a "super" beach rake and mesh front end loader buckets that are currently being developed/manufactured. Should these techniques be implemented by the City, the City will amend their Corps permit to include them.

III.24 Would this Require a Majority Vote of the City Council?

Amending the City's beach maintenance permit with USACE would require a majority vote from the City Council.

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III.25 What are the Odds of the City Obtaining a Majority Vote from the City Council to amend a permit once it has been issued?

It is anticipated that a majority vote to amend the permit to include alternative beach maintenance methods would be easily achieved.

III.26 How long would the Amendment Process Take?

It is the City's understanding the amendment process can take anywhere from three months to one year, depending on the complexity of the amendment request and whether the request can be handled administratively by USACE or would require additional coordination with resource agencies and the public.

IV. REQUESTED ACTION

On behalf of the applicant, the City of Port Aransas, we request that USACE process this information as expeditiously as possible. Please do not hesitate to contact me at 361-857-2211 with any questions, comments, or requests for additional information.

Sincerely,

HDR ENGINEERING, INC.

Jeffrey Pollack
Environmental Scientist

JP/ljf

CC: Mr. Michael Kovacs, City of Port Aransas
Mr. David Parsons, City of Port Aransas
Mr. Matthew Kimmel, U.S. Army Corps of Engineers

HDR | **SHINER MOSELEY AND ASSOCIATES, INC.**

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March 5, 2008 66107

Mr. Lloyd Mullins
U.S. Army Corps of Engineers
Corpus Christi Regulatory Office
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411

RE: ALTERNATIVES ANALYSIS FOR U.S. ARMY CORPS OF ENGINEERS APPLICATION NO. SWG-2007-1847 (BEACH MAINTENANCE ACTIVITIES FOR THE CITY OF PORT ARANSAS, MUSTANG ISLAND, NUECES COUNTY, TEXAS)

Dear Mr. Mullins,

I. INTRODUCTION

This document details alternative beach maintenance methodologies evaluated as part of U.S. Army Corps of Engineers (USACE) Application No. SWG-2007-1847 (Beach Maintenance Activities for the City of Port Aransas, Mustang Island, Nueces County, Texas). The response to public comments regarding this proposal has been filed with the Corpus Christi Regulatory Office of the USACE under separate cover. A Tier II 401 Certification Questionnaire and Alternatives Analysis checklist (attached) have been completed and filed with the Texas Commission on Environmental Quality (TCEQ) as part of this permit application process.

II. CURRENT BEACH MAINTENANCE PROCEEDURES

Current beach maintenance practices performed by the City of Port Aransas include:

1. Year-round removal of all non-natural material, such as lumber, plastic bottles, cans etc., from the beach to an off-site municipal sanitary landfill.
2. Year-round vehicular travel way maintenance, including grooming and re-positioning of sand from the toe of the dune line to just above HTL.
3. Seasonal re-location of sand/sargassum from areas on the recreational beach to the following maintenance storage areas:
   a. Above the HTL at base of the foredune on accreting beaches only.
   b. Within troughs behind the foredune on all beaches.
   c. Behind the main dune line on all beaches.
4. Periodic removal of degraded sargassum from beach maintenance storage areas for burial below the MTL.

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Corpus Christi, TX 78478-0010
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III. ALTERNTIVES ANALYSIS

City staff has conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives.

Off-site Disposal

As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law prohibits any sand from being removed from a barrier island.

Non-mechanized Removal

Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

Mechanical Alternatives

The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

No and Minimal Action Alternatives

The City has already initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

IV. REQUESTED ACTION

On behalf of the applicant, the City of Port Aransas, we request that USACE process this information as expeditiously as possible. Please do not hesitate to contact me at 361-696-3362 with any questions, comments, or requests for additional information.

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Sincerely,

HDR ENGINEERING, INC.

Jeffrey Pollack
Environmental Scientist

JP/alo

Enclosures: TCEQ Tier II 401 Certification Questionnaire
TCEQ Tier II Alternatives Analysis Checklist

cc: Mr. Michael Kovacs, City of Port Aransas
Mr. David Parsons, City of Port Aransas

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Texas Commission on Environmental Quality

Tier II
401 Certification Questionnaire

Applicant Name: **City of Port Aransas**

USACE Permit No.: **SWG-2007-1847**

Description of Project: **The purpose of this application is to authorize beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, cans etc.) from the public beach.**

I. Impacts to surface water in the state, including wetlands

A. What is the area of surface water in the State, including wetlands that will be disturbed, altered, or destroyed by the proposed activity? If yes, indicate the area (acres or square feet) that will be affected.

Approximately 170 acres of wetlands and Waters of the U.S. over a 7 mile section of beach between the southern Port Aransas city limits and Lantana Rd. could potentially be impacted. Approximately 22,500 cy of sand and sargassum could be relocated annually from portions of the 7-mile stretch of beach for beach maintenance purposes.

B. Is compensatory mitigation proposed? If yes, submit a copy of the mitigation plan. If no, explain why not.

No compensatory mitigation has been proposed because the proposed project will result in only temporary impacts to wetlands and Waters of the U.S.

C. Please complete the attached Alternatives Analysis Checklist

Attached

II. Disposal of waste materials

A. Describe the methods for disposing of materials recovered from the removal or destruction of existing structures.

All non-natural material such as lumber, plastic bottles, cans, etc. will be removed from the beach to an off-site sanitary landfill. No existing permanent structures will be removed.

B. Describe the methods for disposing of sewage generated during construction. If the proposed work establishes a business or a subdivision, describe the method for disposing of sewage after completing the project.

Not applicable.

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C. For marinas, describe plans for collecting and disposing of sewage from marine sanitation devices. Also, discuss provisions for the disposing of sewage generated from day-to-day activities.

Not applicable.

III. Water Quality Impacts

A. Describe the methods to minimize the short-term and long-term turbidity and suspended solids in the waters being dredged, and/or filled. Also, describe the type of sediment (sand, clay, etc.) that will be dredged or used for fill.

No dredge or fill activities have been proposed.

Best Management Practices (BMPs) will be utilized in accordance with standard approved methods throughout the beach maintenance activities. These BMPs may include, but are not limited to, blending of stored sand/sargassum to promote quicker revegetation, adaptive changes in policy to minimize impacts, and the use of alternate technologies to minimize mechanical activity.

B. Describe measures that will be used to stabilize disturbed soil areas, including: dredged material mounds, new levees or berms, building sites, and construction work areas. The description should address both short-term (construction related) and long-term (normal operation or maintenance) measures. Typical measures might include containment structure, drainage modifications, sediment fences, or vegetative cover. Special construction techniques intended to minimize soil or sediment disruption should also be described.

Sargassum that is removed from the recreational beach to one of the defined storage areas above the HTL will be blended into existing upland swales in order to stabilize sand and to facilitate quicker revegetation without the use of unsightly silt fencing.

The City has also initiated a policy of allowing increasingly larger amounts of sargassum to remain in place as it washes up into the swash zone. Over the nine months since the inception of this approach, the public has become accustomed to small amounts of sargassum as part of the natural beach habitat. As part of this policy, the city maintenance crews intensively patrol the swash zones for trash/litter or other non-natural debris.

The City will implement any additional BMPs to help ensure that the proposed beach maintenance activities do not adversely affect coastal erosion rates.

C. Discuss how hydraulically dredged materials will be handled to ensure maximum settling of solids before discharging the decant water. Plans should include a calculation of minimum settling times with supporting data. (Reference: Technical Report, DS-7810, DREDGE MATERIAL RESEARCH PROGRAM, GUIDELINES FOR DESIGNING, OPERATING, AND MAINTAINING DREDGED MATERIAL CONTAINMENT AREAS.) If future maintenance dredging will be required, the disposal site should be designed to accommodate additional dredged materials. If not, please include plans for periodically removing the dried sediments from the disposal area.

No hydraulic dredging will take place as a part of this project.

D. Describe any methods used to test the sediments for contamination, especially when dredging in an area known or likely to be contaminated, such as downstream of municipal or industrial wastewater discharges.

There is no known occurrence of contaminated materials or likely source of contamination within the 7-mile beach maintenance area. No testing of sediments has been proposed.

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Texas Commission on Environmental Quality

Tier II
Alternatives Analysis Checklist

Applicant Name: **City of Port Aransas**

USACE Permit No.: **SWG-2007-1847**

Description of Project: **The purpose of this application is to authorize beach maintenance activities associated with beach grooming and the periodic removal of sargassum and non-natural items (such as lumber, plastic bottles, cans etc.) from the public beach.**

I. Alternatives

A. How could you satisfy your needs in ways which do not affect surface water in the state?

City staff members have conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives; there is no way to provide the beach maintenance mandated by the Texas Open Beaches Act and by life safety requirements without affecting surface water in the state.

B. How could the project be redesigned to fit the site without affecting surface water in the state?

Any beach maintenance activity along the Gulf beaches of Port Aransas will inherently affect surface waters of the state.

C. How could the project be made smaller and still meet your needs?

The project could not be made smaller and still meet the City's beach maintenance needs within the City's 7-mile beach maintenance area.

D. What other sites were considered?

The City has defined three priority beach maintenance areas from within the 7-mile beach management area.

1. What geographical area was searched for alternative sites?
The disposal of non-natural flotsam and jetsam in an off-site municipal landfill is already an established part of the City's beach maintenance methodology.

Removal of sargassum for disposal at an off-site municipal landfill was considered but deemed impractical for logistical, financial, and legal reasons.

2. How did you determine whether other non-wetland sites are available for development in the area?

   Beach maintenance activities are, by nature, bound to wetland areas. A cost evaluation and practicality review were conducted for alternative, non-wetland material placement options for the material that would be removed from the recreational beach under this proposal. Alternative placement locations that were considered include off-site municipal land fills and compost facilities. Utilization of off-site disposal locations was deemed to be physically, environmentally, financially, or legally infeasible.

3. In recent years, have you sold or leased any lands located within the vicinity of the project? If so, why were they unsuitable for the project?

   No.

E. What are the consequences of not building the project?

Texas Statute requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches. The proposed beach maintenance activities are in accordance with the Texas Open Beaches Act to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore necessary to ensure compliance with state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreation areas and the surf zone; failure to implement the proposed beach management activities would represent a life safety liability.

II. Comparison of alternatives

A. How do the costs compare for the alternatives considered above?

City staff members have studied multiple options for beach maintenance and sargassum management, including: trucking the sargassum to off-site locations for disposal, leaving the sargassum in place and sifting beach sand out by some combination of mechanical and non-mechanical means, and a no-action scenario. Even if the legal and physical constraints to off-site disposal of sargassum could be overcome, the financial cost of this alternative would be orders of magnitude greater than the management activities currently being proposed by the City. While the expenses associated with physical beach maintenance activities would be reduced under the no-action scenario, the significant legal and financial liability associated with this approach makes it untenable.

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B. Are there logistical (location, access, transportation, etc.) reasons that limit the alternatives considered?

Yes. The shear volume of sargassum present on Coastal Bend beaches makes collection and transport to off-site location physically impractical.

C. Are there technological limitations for the alternatives considered?

Yes. The volume of sargassum that occurs in the beach maintenance project area and the nature and scale of the proposed activities makes non-mechanized maintenance of the beach physically impractical.

D. Are there other reasons certain alternatives are not feasible?

Yes. State law prohibits the removal of sand from a barrier island, negating the potential for off-site disposal of sargassum.

III. If you have not chosen an alternative that would avoid impacts to surface water in the state, explain:

A. Why your alternative was selected.

As detailed above, the beach maintenance methods being proposed constitute the only alternative that is physically, environmentally, financially, and legally feasible.

B. What you plan to do to minimize adverse effects on the surface water in the state impacted.

The City is actively pursuing alternative beach maintenance technologies that might include the development/manufacture of a beach super-rake or mesh front-end loader attachment that would facilitate sifting of sand from sargassum. In addition, the City has already begun to implement a policy of leaving more sargassum on the beach and educating the general public that small amounts of natural beach wash-up (seaweed, sticks, organisms, etc.) are an important part of the beach ecosystem.

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IV. Please provide a comparison of each criteria (from Part II) for each site evaluation in the alternatives analysis.

Alternative	Meets Objectives?	Physically Practical?	Financially Practical?	Legally acceptable?
No-action	No	Yes	Yes	No
Non-mechanized maintenance	No	No	Yes	Yes
Mechanized maintenance (off-site disposal)	Yes	No	No	No
Mechanized maintenance (on-site disposal)	Yes	Yes	Yes	Yes

HDR | **SHINER MOSELEY AND ASSOCIATES, INC.**

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April 29, 2008

66107

Mr. Lloyd Mullins
U.S. Army Corps of Engineers
Corpus Christi Regulatory Branch
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411

RE: DRAFT BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES FOR PROPOSED BEACH MAINTENANCE ACTIVITIES, CITY OF PORT ARANSAS, MUSTANG ISLAND, NUECES COUNTY, TX (USACE PERMIT APPLICATION # SWG-2007-1847).

Dear Mr. Mullins,

Please find enclosed a draft Biological Assessment of Potential Impacts to Threatened and Endangered Species for proposed beach maintenance activities for the City of Port Aransas, Mustang Island, Nueces County, TX (U.S. Army Corps of Engineers (USACE) Application No. SWG-2007-1847). A Response to Agency and Public Comments and an Alternatives Analysis have already been submitted under separate cover.

On behalf of our client, the City of Port Aransas, thank you very much for your time and for your prompt attention to this matter. Please contact me directly at (361) 334-6005 or at jeffrey.pollack@hdrinc.com with any questions.

Sincerely,

HDR ENGINEERING, INC.

Jeffrey Pollack
Environmental Scientist

JAP/alo

Enclosures: Draft Biological Assessment of Potential Impacts to
Threatened and Endangered Species
Permit Drawings Sheets 1-8

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DRAFT BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES

DEPARTMENT OF THE ARMY PERMIT APPLICATION SWG-2007-1847
BY
CITY OF PORT ARANSAS

U.S. ARMY ENGINEER DISTRICT, GALVESTON
APRIL 2008

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1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this Biological Assessment (BA) is to fulfill the U.S. Army Corps of Engineer's (USACE) requirements as outlined under Section 7(a) of the Endangered Species Act (ESA) of 1973 as amended. The proposed action requiring the assessment is Department of the Army (DA) permit application SWG-2007-1847 which would authorize beach maintenance activities along a 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits north to Lantana Drive (See Exhibit 1) in Port Aransas, Mustang Island, Nueces County, TX. The work is proposed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Table 1 is a list of federally listed species in Nueces County presented in this BA. For the purposes of this BA, the project area is defined as the area where the actual beach maintenance will take place, as depicted in the DA 24192 permit application drawings (Attachment 1).

1.2 DESCRIPTION OF THE PROPOSED ACTION

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide
only during periods when there is an abundance of material in the dunes
D. Repositioning of sand from the toe of the dune or other areas above the annual High Tide Line (HTL) to areas on the beach between HTL and Mean High Tide Line (MTL) in order to maintain clear driving lanes along the beach for public access.

Schedule of Work:
Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance (See Exhibit 2):

1. **Priority Area A -** High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B -** Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C -** Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

Any additional work conducted on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders –** This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders –** The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from

below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

- **Skid-O-Can Pumper Trucks** – This piece of equipment is utilized to remove wastes from skid-o-cans located in Areas A, B, and C.

If beach maintenance activities consistently result in ruts greater than two inches deep, the City has stated that retrofitting of tires will be considered. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City maintains that they will not commit to anything more than consideration of this practice at this time.

The City of Port Aransas has the following Public Works Staff assigned to beach maintenance:

- **4 Full-time Heavy Equipment Operators** - Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; primarily responsible for removal of sargassum and roadway maintenance.

- **2 Supervisors** - Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff. Also can be responsible for running all heavy equipment such as front-end loaders, tractors, and motor.

- **6 Full-time Ground Custodians** – Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.

- **1 Skid-O-Kan Operator** - Responsible for maintaining Skid-O-Kans located on the beach. This includes the removal of waste via a waste pumping truck that is driven to each Skid-O-Kan location.

- Between 15 March and 30 July of each year, a trained turtle monitor will be onsite in the immediate area where the beach is being maintained while activities are underway to be alert for any sign of turtles or turtle nests which may be impacted. Additionally, the monitor will advise the City as to the degree of any rutting that may be occurring as a result of the beach maintenance.

1.3 SUMMARY OF ALTERNATIVES CONSIDERED

City staff has conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives.

Off-site Disposal

As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law prohibits any sand from being removed from a barrier island.

Non-mechanized Removal

Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

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Mechanical Alternatives

The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

No and Minimal Action Alternatives

The City has already initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

Alternative	Meets Objectives?	Physically Practical?	Financially Practical?	Legally acceptable?
No-action	**No**	**Yes**	**Yes**	**No**
Non-mechanized maintenance	**No**	**No**	**Yes**	**Yes**
Mechanized maintenance (off-site disposal)	**Yes**	**No**	**No**	**No**
Mechanized maintenance (on-site disposal)	**Yes**	**Yes**	**Yes**	**Yes**

2.0 IMPACT ASSESSMENT FOR LISTED SPECIES

To assess the potential impacts of the proposed project on endangered and threatened species, USACE Galveston District personnel and the applicant had meetings with the FWS, telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on these species. Significant literature sources relied upon in the preparation of this BA include the FWS series on endangered species of the seacoast of the U.S. (National Fish and Wildlife Laboratories (NFWL), 1980), Federal status reports and recovery plans, and performance reports of the Texas Parks and Wildlife Department (TPWD).

Of the 13 endangered species listed in Table 1 that are potentially present in the project area, possible impacts to the piping plover and five species of sea turtle have been identified to result from this project.

TABLE 1
ENDANGERED AND THREATENED SPECIES OF POTENTIAL OCCURRENCE IN THE DA PERMIT APPLICATION SWG-2007-1847 PERMIT AREA IN NUECES COUNTY, TEXAS[1]

Common Name	Scientific Name	Federal Listing Status
Gulf Coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered
Ocelot	*Leopardus pardalis*	Endangered
Brown pelican	*Pelecanus occidentalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened w/critical habitat in Texas
Slender Rush Pea	*Hoffmannseggia tenella*	Endangered
Kemps Ridley turtle	*Lepidochelys kempii*	Endangered
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered w/critical habitat designated (or proposed) outside Texas
Leatherback sea turtle	*Dermochelys coriacea*	Endangered w/critical habitat designated (or proposed) outside Texas
Green sea turtle	*Chelonia mydas*	Threatened w/critical habitat designated (or proposed) outside Texas
Loggerhead sea turtle	*Caretta caretta*	Threatened
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered
West Indian Manatee	*Trichechus manatus*	Endangered
Whooping Crane	*Grus americana*	Endangered

[1] According to U.S. Fish and Wildlife Service letter dated June 7, 2006 regarding DA application 24192.

2.1 GULF COAST JAGUARUNDI

2.1.1 Reasons for Status

The jaguarundi *(Herpallurus yagouaroundi cacomitli)* was listed by FWS as endangered on June 14, 1976 (41 FR 24064). Habitat loss and alteration due to brush-clearing activities, and human persecution are the main causes for the decline in jaguarundi populations (FWS, 1995a).

2.1.2 Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6% of the land area in south Texas is this type of habitat (Tewes and Everett, 1987). The thickets do not have to be continuous and may be interspersed with clear areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn, 1970; Davis and Schmidly, 1994). In South America, habitat includes high mountain forests, tropical forests, swamp forests, savannahs, overgrown pastures, and thickets (NFWL, 1980; Tewes and Schmidly, 1987).

The most common plants occurring in habitats in the Rio Grande Valley where the jaguarundi is known to occur are huisache, blackbrush acacia, prairie baccharis *(Baccharis texana),* chillipiquin *(Capsicum annuum),* lotebush, allthorn goatbush, Texas persimmon *(Diospyros texana),* coyotillo *(Kawinskia humboldtiana),* common lantana *(Lantana horrida),* berlandier wolfberry *(Lycium berlandieri),* javelina brush *(Microrhamnus ericoides),* Texas prickly pear *(Opuntia Iindheimen),* retama, honey mesquite, cedar elm *(Ulmus crassifolia),* and lime pricklyash *(Zanthoxylum fagara)* (Goodwyn,1970).

Jaguarundis have two distinct color phases, red and gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Felis eyra*. A third color phase, black, has also been reported, but apparently does not occur in Texas (Goodwyn, 1970).

Like the ocelot, the jaguarundi is primarily nocturnal, although some diurnal activity has been recorded. Jaguarundis are excellent climbers although they spend most of the time on the ground. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Jaguarundis communicate by calls, of which 13 have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley, 1976).

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets, hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Young have been born in March and August and possibly two litters occur per year. Usually 2 to 4 young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Gestation (for captive jaguarundi) varies from 63 to 75 days (Goodwyn, 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994).

2.1.3 Range

The jaguarundi historically occurred in southeast Arizona, south Texas, and Central and South America as far south as northern Argentina. Today this cat has a similar distribution, but in much reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly, 1987). The presence of jaguarundis in Florida is likely the result of human introduction (Nowak and Paradiso, 1983).

Four North American subspecies are recognized, of which two occur in the U.S.: *H.y. cacomitli* from southern Texas to central Vera Cruz, Mexico, and *H.y. tolteca* from southern Arizona, along the Pacific coast of Mexico, and inland to the Mexican Plateau (Goodwyn, 1970; NFWL, 1980).

2.1.4 Distribution in Texas

Tewes and Everett (1987) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundis (and ocelots) in Texas. Many of the reports were solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf coast as well as from south Texas. However, due especially to the lack of any tangible evidence such as road kills, most of the sightings in the first two areas are believed to have been of black feral house cats. Two dead jaguarundis were reported in Cameron County and one each in Willacy and Webb counties. Tewes (1987) and Tewes and Everett (1987) documented several other credible reports of jaguarundis in these three counties. One of these was of a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Kellers Corner) in Cameron County on April 21, 1986 (Tewes, 1987; Laack and Rappole, 1 987b). Although this was the last confirmed record of a jaguarondi in Texas (Laack, 1998), unconfirmed jaguarundi sightings in Hidalgo County include Bentsen Rio Grande State Park, Santa Ana NWR, Lower Rio Grande Valley NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the TPWD Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Unconfirmed but reliable sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous, 1989). Recent jaguarundi sightings have been reported from the Santa Ana NWR for March 1998 (Santa Ana NWR data). Based on sighting reports, personnel of the Santa Ana NWR suspect the presence of jaguarundis on the refuge (Benn, 1997).

Tewes and Everett (1987) concluded that until verifiable evidence of jaguarundis from central Texas and the upper Gulf coast was forthcoming, jaguarundi distribution in Texas should be considered as restricted to the Rio Grande Valley. The number of jaguarundis in Texas is unknown, but certainly less than that of ocelots.

2.1.5 Presence in the Project Area

Jaguarundis are not known to occur within the project area due to lack of suitable habitat. The last documented siting of the species occurred more than 130 miles south of the project area on the mainland where suitable thorn-scrub habitat is available.

2.1.6 Effects of the Project

This project is expected to have no effect on the jaguarundi, as it is unlikely to occur on the beach area near project activities due to the lack of suitable brushy habitat.

2.1.7 Conservation Measures

Because no potential effects to the jaguarundi will occur as a result of the proposed project, no additional conservation measures are needed.

2.1.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the jaguarundi.

2.2 OCELOT

2.2.1 Reasons for Status

The ocelot *(Leopardus pardalis)* is listed as endangered throughout its present range (FWS, 1995a, 2000b). Habitat destruction and degradation due to brush-clearing has been the major cause for its population decline, but predator control activities and hunting have also contributed. In Central and South America, exploitation for the fur and pet trade is primarily responsible for population declines (NFWL, 1980; FWS, 1995a).

2.2.2 Habitat

The ocelot occupies a variety of habitats throughout its neotropical range including tropical and subtropical forests, riverine forests, swampy savannahs, estuarine mangroves, rocky areas, and upland oak forests (NFWL, 1980; Tewes and Schmidly, 1987; Murray and Gardner, 1997). In Texas, however, ocelots inhabit dense, often thorny and impenetrable brush, mesquite-oak and oak forests, and partially cleared land (NFWL, 1980; Navarro, 1985). Tewes (1986) found honey mesquite, acacias, condalia *(Condalia* spp.), allthorn goatbush *(Castella toxana),* granjeno, cenizo, and whitebrush *(Aloysia texana)* to be the dominant brush species of ocelot habitat in south Texas. Approximately 1.6% of the land area in south Texas now supports this type of habitat (Tewes and Everett, 1987).

Tewes and Everett (1987) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A or optimal habitat was 95% canopy cover, Class B or suboptimal habitat was 75% to 95% canopy cover, and Class C, with 75% or less canopy cover, was considered inadequate. The most critical component of habitat is probably dense cover near the ground (<3 feet in height) (Tewes, 1986).

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro, 1985; Tewes, 1986; Tewes and Schmidly, 1987). Navarro (1985) found ocelots in Texas to have two peaks of activity, one at about midnight and the other at daybreak. Ocelots feed on small and medium-sized mammals such as woodrats *(Nootoma* spp.), rabbits *(Sylvilagus* spp.), young deer *(Odocoious* spp.), nutria *(Myocastor coypus),* birds, reptiles, amphibians, fish, insects and, in Latin America, spider monkeys *(Ate/es* sp.), coatis *(Nasua nasua),* and agoutis *(Agouti* sp.) (Hall and Dalquest, 1963; Guggisberg, 1975; Navarro, 1985; Tewes and Schmidly, 1987; Emmons, 1988).

Although breeding occurs throughout the year in the tropics, it occurs primarily in the fall (September through November) in Texas; however, births have also been recorded in April, June, July and August. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Petrides et al., 1951; Navarro, 1985; Tewes, 1986; Laack and Rappole, 1986, 1987a; Tewes and Schmidly, 1987). Gestation is 70 to 80 days. Litter size ranges from two to four, with two being the most common. The mother provides extended parental care to the young because it takes time for them to become proficient at capturing prey. Males are believed to contribute little towards direct parental care (Tewes, 1986). Ocelots in the wild become sexually mature at 16 to 18 months (Schauenberg, 1979), but in captivity, maturity may be reached in as little as 10 to 12 months.

Navarro (1985) found that the average home range (the area that an animal occupies during its normal daily activities) for three male ocelots in south Texas was 618 acres, and for one female was 519 acres. Similarly, Twedt and Rappole (1986) reported home ranges of 865 and 296 acres for two male ocelots on Yturria Ranch in Willacy and Kenedy counties. However, Tewes (1986), using a much larger database, found the average home range of south Texas ocelots to be 4,372 acres for males and 2,717 acres for females. The overall average for adults was 3,754 acres. Although male ocelots had larger territories than the females and generally covered an extensive area in a short period, females used the home range more intensively (Tewes, 1986; FWS, 1990b). Tewes (1986) also determined that home ranges expanded in the winter and contracted in the summer. Both Navarro (1985) and Tewes (1986) found little overlap in the home ranges of adjacent males, but quite a considerable intersexual spatial overlap in the home ranges. Tewes and Schmidly (1987) and Navarro (1985) also found that the home ranges were closely aligned with the amount of suitable available habitat. At Laguna Atascosa NWR, for example, an increase in the ocelot population has resulted in smaller home ranges, two ocelots occupying an area that had previously supported only one (Tewes, 1988). Some individuals there currently inhabit areas as small as 80 acres (Tewes, 1988).

2.2.3 Range

Historically, the ocelot occurred in Arkansas, Arizona, southern California, and south through Central and South America to Peru, Uruguay, and northern Argentina (Navarro, 1985). Today it ranges from Arizona and Texas through Central and South America to northern Argentina, but in reduced numbers (Tewes and Everett, 1987; Emmons, 1990; Murray and Gardner, 1997).

2.2.4 Distribution in Texas

The ocelot once occurred in the eastern, central and southern portions of Texas, but currently only exists in the extreme south of the State (Davis and Schmidly, 1994). As a first step to determining the status of the ocelot in Texas, a clearinghouse for ocelot (and jaguarundi) sightings was established in October 1981 to coordinate reception and filing of reports. A total of 1,572 questionnaires was mailed to trappers to obtain additional information; of these, 472 (30%) were returned and 87 (6%) contained positive responses (Tewes and Everett, 1987). From these results, it appears that two significant populations of ocelots exist in south Texas. One population inhabits parts of Hidalgo, Starr, Cameron, and Willacy counties, and the other, Jim Wells, Live Oak, McMullen and Atascosa counties. Six or seven smaller populations may also occur. Based on studies of spatial patterns and densities of radio-collared ocelots, Tewes (1986) estimated that only 80 to 120 ocelots occur in Texas. Laack (1998) currently puts this number at 100. A population of approximately 30 to 40 ocelots occurs on the Laguna Atascosa NWR in Cameron County (Laack, 1998). One or two ocelots apparently occur at the Santa Ana NWR (Benn, 1997; Laack, 1998), and one pair of ocelots had territories near the Arroyo Colorado in Cameron County (Laack, 1998). Ocelots have been sighted at the NAS's Sabal Palm Grove Sanctuary (Homerstad, 1986); and at the Loma de Grulla complex north of Laguna Vista, at Moranco Blanco, and at Redhead Ridge (Tewes, 1987). Ocelot sightings have also been reported from the Lower Rio Grande Valley NWR. In addition, Laack and Rappole (1986, 1987a), Tewes (1987) and Homerstad (1987) have documented several other ocelot sightings in Cameron County. The closest ocelot population in Mexico is near San Fernando, approximately 100 miles south of the U.S.-Mexico border (Laack, 1998).

2.2.5 Presence in the Project Area

Ocelots are not known to occur within the project area due to lack of suitable habitat. Species populations are known to occur more than 130 miles south, and more than 50 miles west of the project area on the mainland where dense, brushy habitat is present.

2.2.6 Effects of the Project

This project is not expected to affect the ocelot, since it is unlikely to occur in the vicinity of project activities due to the lack of suitable brushy habitat in these areas.

2.2.7 Conservation Measures

Because no potential effects to the ocelot will occur as a result of the proposed project, no additional conservation measures are needed.

2.2.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the ocelot.

2.3 BROWN PELICAN

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2.3.1 Reasons for Status

The brown pelican *(Pelecanus occidentalis)* was listed as endangered throughout its foreign range on June 2, 1970 (35 FR 8495) and throughout its U.S. range on October 13, 1970 (35 FR 16047). Population declines were attributed largely to chlorinated hydrocarbon residues from the use of pesticides, such as DDT compounds (DDE, DDD, and DDT), polychlorinated biphenyls (PCBs), dieldrin, and endrin, which caused eggshell thinning; thus, eggs became desiccated and were more easily broken during incubation (NFWL, 1980). Other factors included human disturbance and loss of habitat due to commercial and residential development (FWS, 1995a). Pelicans are large, heavy birds and easily flushed from the nest. Flushing exposes the eggs and young to predation, temperature stress and permanent abandonment by the parents.

A ban on the use of DDT in the U.S. in 1972, together with efforts to conserve and improve remaining populations, has led to increased numbers of brown pelicans. Populations in some areas have increased to historical breeding levels or above, with stable population numbers and productivity. The brown pelican has been delisted along the U.S. Atlantic coast and, in Florida and Alabama, along the Gulf coast. It remains endangered throughout the rest of its range, which includes Mississippi, Louisiana, Texas, California, Mexico, Central and South America, and the West Indies. In May 1998, the FWS announced its intention to either delist or downlist to threatened status numerous species, including the brown pelican (63 FR 25502—25512; May 8, 1998).

2.3.2 Habitat

Brown pelicans inhabit shallow coastal waters with water depths up to 80 feet (Palmer, 1962; NFWL, 1980; Fritts et al., 1983). They are rarely found inland and do not venture more than 20 miles out to sea except to take advantage of particularly good feeding situations (FWS, 1980). Distances of 61 miles from shore have been recorded (Fritts et al., 1983). Brown pelicans, which are colonial nesters, usually nest on undisturbed offshore islands in small bushes and trees, including mangroves, and in humid forests (NFWL, 1980; Guzman and Schreiber, 1987). Occasionally they nest on the ground and preferred sites are those free from human disturbance, flooding, and terrestrial predators, such as raccoons and coyotes. Brown pelicans utilize beaches, sandbars, sandspits, mud flats and even manmade structures such as piers, wharves, pilings, oil/gas platforms, and docks for loafing (NFWL, 1980). No critical habitat has been designated for this species.

2.3.3 Range

The brown pelican occurs along the Pacific coast of the Americas from southern British Columbia south to Cape Horn and throughout the Atlantic, Gulf and Caribbean coastal areas from New Jersey south to eastern Venezuela. In North America, it occasionally ventures inland north to North Dakota, Ontario and Nova Scotia. Its breeding range is more restricted: along the Pacific coast from central California south to Chile, including the Galapagos Islands; and from

North Carolina, south to eastern Venezuela, the West Indies, Greater Antilles, and Virgin Islands (American Ornithologists' Union (AOU), 1998).

In North America, two subspecies are recognized: the eastern brown pelican (*P.o. carolinensis*) ranging from North Carolina south through Florida and west to Texas, and the California brown pelican (*P.o. californicus*) in California (NFWL, 1980). For the eastern subspecies, the present range is the same as the historical one, but in reduced numbers. It became extirpated in Louisiana in 1966, but has since (beginning in 1968) been reintroduced from Florida. It has never been known to nest in Mississippi or Georgia (FWS, 1980; 50 FR 4938, February 9, 1985). Brown pelican colonies are known to occur on the east coast of Mexico off the eastern tip of the Yucatan Peninsula (Mabie, 1986, 1988).

While some migration occurs after nesting in both subspecies, many individuals overwinter close to their breeding grounds (FWS, 1980). Atlantic coast populations move southward in the fall, with most birds wintering in the U.S., particularly in Florida. Some birds, however, disperse to the Cuban coast (Clapp et al., 1982). Gulf coast birds tend to remain on the Gulf coast, although Texas and Louisiana birds have been recovered in Mexico and Cuba (Palmer, 1962; Clapp et al., 1982).

2.3.4 Distribution in Texas

Historically, the brown pelican was a common bird of the Texas Gulf coast with an estimated breeding population of 5,000 pairs residing in 17 colonies in 1918 (Mabie, 1990). By the 1960s, however, it was almost extirpated. In 1963, only 14 breeding pairs were recorded along the Texas coast and in 1964 no known nesting occurred (Mabie, 1986). The decline started during the 1920s and 1930s due to human disturbance (Oberholser, 1974), but continued due to pesticide contamination (King et al., 1977; Mabie, 1986). Since the 1960s, the brown pelican has made a gradual comeback in Texas with an estimated 2,400 breeding pairs in 1995 (Campbell, 1995). Most of the breeding birds have traditionally been found on Pelican Island in Corpus Christi Bay, Nueces County, and Sundown Island near Port O'Connor in Matagorda County. Smaller groups or colonies occasionally nest on Bird Island in Matagorda Bay, a series of older dredged material islands in West Matagorda Bay, Dressing Point Island in East Matagorda Bay, and islands in Aransas Bay (Campbell, 1995). No current nesting sites are known from the lower Texas Coast. Although brown pelican colonies are not monitored every year, 1,900 and 750 pairs nested on Pelican Island in 2003 and 2004 respectively, and on Sundown Island, 1,714 pairs nested in 2005 and 987 pairs nested in 2004 (FWS, 2005a). Recent predation on Pelican Island resulted in no observed 2005 breeding pairs, which has possibly led displaced breeding pairs to use Shamrock Island with 340 pairs, and Sunfish Island with 30 pairs, both islands which are located in Corpus Christi Bay. Further to the south, 100 breeding pairs were observed on a Laguna Vista island in 2004 (FWS, 2005a).

2.3.5 Presence in the Project Area

In Texas, the brown pelican occurs from Chambers County to Cameron County (Campbell, 1995), primarily along the lower and middle coasts. Occasional sightings are reported on the upper coast and inland to central, north-central, and eastern Texas (Texas Ornithological Society (TOS), 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. The Padre Island National Seashore (PINS) checklist of birds lists the brown pelican as an uncommon from March through November and rare in winter and is more common on the Gulf side of Padre Island than in the Laguna Madre (Southwest Parks and Monuments Association (SPMA), 1990). Brown pelicans are likely to occur in the project area and immediate vicinity as post-breeding visitors or migrants.

2.3.6 Effects of the Project

This species is expected to forage in the project area or general vicinity on occasion, and it could potentially be temporarily affected from noise and activity from the proposed project. Because the nearest active nesting colony is at Shamrock Island, approximately 7.0 miles southwest of the proposed project at it closest point, nesting pelicans will not be impacted by the project. Direct impacts to loafing and feeding birds may result from beach maintenance vehicles and activities. Beach maintenance activities may disturb brown pelicans causing them to take flight and relocate to other feeding and loafing areas. This displacement will be temporary since birds disturbed by traffic or human activities generally move a short distance away and continue to perform their pre-disturbance behavior. No significant impacts to this species are anticipated as a result of this project.

2.3.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the status and habitats of this species. Because only temporary potential effects to the brown pelican may occur as a result of the proposed project, no additional conservation measures are identified.

2.3.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the brown pelican.

2.4 PIPING PLOVER

2.4.1 Reasons for Status

The piping plover *(Charadrius melodus)* was Federally listed as endangered on December 11, 1985, for the Great Lakes watershed and was listed as threatened throughout the remainder of its range (50 FR 50726). The rule became effective on January 10, 1986. In 1986, an estimated 2,100 to 2,300 breeding pairs occurred in North America: 1,337 to 1,409 pairs in the northern Great Plains, 19 to 24 pairs in the Great Lakes, and 799 pairs along the Atlantic coast (Haig et al., 1987). Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat due to commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and the draining of wetlands have further contributed to the decline of the species (FWS, 1995a). Additional threats include human disturbances through recreational use of habitat and predation of eggs by feral pets (FWS, 1995a).

2.4.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include: sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on emergent dredged material placement areas as well as natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. On the wintering grounds, these birds utilize beaches, mud flats, sand flats, dunes, and offshore spoil islands (AOU, 1998; FWS, 1995a). Much of the Laguna Madre in Mexico became less suitable as important wintering areas for this species when its water level was stabilized for a fisheries lagoon. In Texas, an estimated 30% of wintering habitat had been lost over a 20-year period (50 FR 50726; December 11, 1985). Critical habitat has been designated for this species in the project area as described below.

2.4.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario), and along the Atlantic coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf of Mexico coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 FR 50726, December 11, 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic coast (AOU, 1998). Little is known about the migration routes of this species.

2.4.4 Distribution in Texas

The piping plover begins arriving at its post-breeding and wintering grounds in Texas in mid to late July. Haig and Oring (1985, 1987) found that early in the post-breeding season, piping plovers frequented beaches, but later tended to inhabit ephemeral sand flats along the backside of barrier islands. Observations of wintering piping plovers in Alabama did not indicate a seasonal preference between habitats, although wintering plovers spent more than 85% of their time on sand flats or mud flats each month (Johnson and Baldassarre, 1988). Along the Texas coast, a correlation appears to exist between tidal height and habitat selection, with piping plovers actively feeding on tidal flats during periods of low tides, and on the Gulf beaches during high tides (Eubanks, 1991; Zonick, et al., 1998; Drake et al., 2000). Winter distribution studies along the Atlantic and Gulf coasts found piping plovers usually occurring in small, unevenly distributed groups along the coast; however, the sites with largest concentrations of plovers consisted of expansive sand flats or mud flats with sandy beach in close proximity (Nicholls and Baldassarre, 1990). Plovers on the wintering grounds suggest that they show some site fidelity, returning to the same stretch of beach year after year. On the lower Texas coast, individual plovers are known to use areas about 3,000 acres in size, moving 2 miles or more between foraging sites as tidal movements shift the availability of productive tidal flats (TPWD). Recent studies show significantly more stringent site fidelity with individual birds returning to more precise locations (+/-400 feet in lateral distance on the beach) each year (Amos, 2006). Piping plover concentrations in Texas occur in Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio and Willacy counties (FWS, 1988). FWS (1995a) estimates that approximately 1,900 piping plovers, or approximately 35%, wintered along the Texas Gulf coast.

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consist of coastal beach, sand flat and mud flat habitats.

Critical Habitat for the wintering grounds (as opposed to breeding population Critical Habitat) has recently been designated in Texas by the FWS (66 FR 36074—36078), some of which lies partially or entirely within the project area:

- TX-3 (subunit 4) – This subunit extends along the gulf shore of Padre Island from the northern boundary of Padre Island National Seashore at the shore, north to the Nueces-Kleberg county line.
- TX-8- Mustang Island Beach – This is a stretch of beach extending from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas, TX. The landward boundary is the beginning of dense vegetation, and the gulfward boundary is MLLW.

Other Critical Habitat areas are located either adjacent to or very near, but not within the project area. These areas will not be disturbed by beach maintenance activities. These include:

- TX-5 – Upper Laguna Madre – This unit includes a series of small flats along the bayside of Padre Island in the Upper Laguna Madre. The landward boundary is the beginning of dense vegetation and the waterward boundary is the MLLW in the Laguna Madre. It is bounded in the north by the Nueces/Kleberg County line and in the south by the northern boundary of PINS.
- TX-6 – Mollie Beattie Coastal Habitat – Subunit 1 is bounded in the north by Beach Access Road 3, on the east by the inland boundary of critical habitat Unit TX-7, on the south by Zahn Road, and on the west by Zahn Road. Subunit 2 is bounded on the north by Corpus Christi Pass, on the east by SH 361, on the south by the north side of Packery Channel, and on the west by the Gulf Intracoastal Waterway.
- TX-7 – Newport Pass/Corpus Christi Pass Beach – This unit is along a stretch of Gulf beach 5.3 miles long. It is bounded on the north by Fish Pass, on the east by MLLW, on the south by St. Bartholomew Avenue, and on the west by a line marking the beginning of dense vegetation.
- TX-9 – Fish Pass Lagoons – This unit encompasses flats facing Corpus Christi Bay that extend 0.6 mile on either side of Fish Pass. The inland boundary is the line indicating beginnings of dense vegetation, and the bayside boundary is MLLW.

- TX-10 – Shamrock Island and Adjacent Mustang Island Flats – This unit encompasses Shamrock Island, an unnamed small sand flat to the north of Wilson's Cut, and a lagoon complex that extends 2.2 miles to the southwest of Wilson's Cut. Critical habitat includes land to the line marking the beginning of dense vegetation down to MLLW.

On 26 July 2006, the United States District Court, Victoria County, Texas handed down a ruling in regards to a court case between the GLO and USFWS, which vacated the critical habitat rule adopted by the Service on July 10, 2001, (66 FR 36038) for 19 of the 37 Texas Critical Habitat units designated for the Wintering Piping Plover. This ruling remanded the service to conduct new rulemaking in accordance with all applicable federal laws. All of the above referenced areas, with the exception of TX-5 and TX-6 (located outside the immediate project area), were included in this ruling. As of the writing of this biological assessment, the USFWS is still re-evaluating these areas and reclassification of those units affected by this ruling has not been completed.

2.4.5 Presence in the Project Area

The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser 1974; Haig and Oring, 1985, 1987; Haig and Plissner, 1993; TOS, 1995) and wintering birds have been reported along the length of the Texas coast. The PINS checklist of birds lists the piping plover as a common winter resident but as an uncommon summer inhabitant of Gulf and bay environs within the seashore (SPMA, 1990).

During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW, 1996). The proposed project area was included in that survey.

Piping plover may occur throughout the project area, though with varying numbers and concentrations depending on annual fluctuations of the regional climate and time of year. Portions of two former critical habitat areas, TX-3 (subunit 4) and TX-8, are located on Gulf of Mexico beaches within the project area and both contain a similar wide, sandy beach habitat type.

2.4.6 Effects of the Project

The effects of the proposed beach maintenance activities on the piping plover are expected to be minimal. In studies along the Laguna Madre, Drake et al. (2000) found that overall usage of relatively undisturbed beach habitats by wintering piping plovers, including both foraging and roosting activities, was minimal (2.8%). Piping plovers were found primarily to use beach habitats when other preferred habitats were unavailable, such as when algal and sand flats were inundated. This is considered to be partly due to the prime availability of forage species on tidal flats but also possibly due to the high level of disturbance on beach habitats (Drake et al., 2000). The entire beach area included in the permit application currently receives considerable use by recreational beach visitors. This high use does result in disturbance to piping plovers. Mechanized cleaning of the beaches will also result in some additional disturbance to individual birds using the beach; however, unlike the beach use by the public, beach maintenance activities tend to occur in only small segments of the beach at any one time and thus are likely to pose only a minor and temporary disturbance to resting and foraging birds when compared to general recreational use of the beach in general. Further, periodic cleaning of the beaches will result in the removal of large quantities of debris and sargassum, which, if not removed, result in the coverage of large expanses of the open beach. Removal of these items will actually expose more of the beach for use by foraging piping plovers.

The effects of beach maintenance activities on piping plover habitat with respect to erosional impacts on habitat area are expected to be minimal. Erosion rates are increasing along most of the Texas coast; the proposed beach maintenance activities are not expected to have an appreciable influence on local erosion rates.

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island (a beach which is described as having a history of beach maintenance activity) than on St. Joseph Island, a beach that is not cleaned. In addition, this same study suggests a general increase of total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels than in years where the sargassum levels are considerably higher. These observations tend to show a positive effect on the piping plover where the beaches are more open with less occurrence of sargassum accumulation.

In summary, the proposed project is unlikely to result in any appreciable change in available critical habitat for the piping plover. Sargassum clearing activities may remove structure that plovers use for protection from the elements, but beach clearing is at a minimum during winter months when the birds are most likely to need protection from the elements. Further, sargassum removal may actually free up open beach foraging areas on a temporary basis. There will be no impact to plover nesting, as it does not occur in Texas. Wintering plovers that currently use the project area are already subjected to regular, and in some cases more prolonged, displacement by the public's recreational use of the beaches. Direct impacts to piping plovers from beach maintenance activities are most likely to occur during the spring and summer months when increased use of the beaches by the public necessitates intensified maintenance activities. Maintenance activities are at a minimum during winter months when plovers are more likely to be found in the proposed project areas. Most beach clearing activities are performed above the "wet beach" area and are thus above the portion of the beach most frequently used for foraging by plovers. Beach maintenance activities may temporarily displace plovers causing them to take flight, but displaced birds can easily relocate to adjacent habitat, as beach maintenance operations will be limited to only a fraction of the total project area at any given time. In fact, HDR/Shiner Moseley biologists have observed displaced birds relocating to other habitats, many of which are a short distance (less than 150 feet) from the area of disturbance. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements. In addition, periodic removal of considerable amounts of debris and sargassum will actually uncover more of the beach and thus allow for more of the beach to be used as foraging area.

2.4.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species. Because only temporary potential effects to the piping plover may occur as a result of the proposed project, no additional conservation measures are identified.

2.4.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the piping plover.

2.5 SLENDER RUSH PEA

2.5.1 Reasons for Status

The slender rush pea *(Hoffmannseggia tenella)* was first proposed as an endangered species on November 21, 1984 and became listed as endangered on November 1, 1985 (50 FR 45614, 45618). The reasons for decline (comments published in the Federal Register, 50 FR 45614, February 25, 1986) identified the loss due to conversion of Gulf Coastal Prairies to agriculture and competition from nonnative grasses (primarily King Ranch bluestem and Bermuda grass) that have been introduced for soil stabilization and pasture improvement. Limited distribution and low population numbers make this species vulnerable to any further disturbance.

2.5.2 Habitat

Slender rush pea grows on calcareous, clayey soils in prairies and creek bands associated with short and midgrasses such as buffalograss, Texas wintergrass (Stipa leucotricha), and Texas grama. Woody plants such as honey mesquite, huisache, huisachillo (Acacia tortuosa), granjeno, brasil (Condalia hookeri), retama, lotebush (Zizyphus obtusifolia), tasajillo (Opuntia leptocaulis), and pricklypear (Opuntia spp.) are also common at the known sites. No critical habitat has been designated for this species.

2.5.3 Range

The slender rush pea, known only to Texas, can be found along the South Texas Gulf coast counties of Kleberg and Nueces (TPWD, 1999c).

2.5.4 Distribution in Texas

The slender rush pea is known from only three or four populations in Kleberg and Nueces counties (TPDW, 1999c).

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2.5.5 Presence in the Project Area

This species is unlikely to occur in the project area due to the lack of suitable soils and habitat.

2.5.6 Effects of the Project

No effects to the slender rush pea are anticipated as a result of this project.

2.5.7 Conservation Measures

Because no potential effects to the slender rush pea will occur as a result of the proposed project, no additional conservation measures are needed.

2.5.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the slender rush pea.

2.6 KEMP'S RIDLEY SEA TURTLE

2.6.1 Reasons for Status

Kemp's ridley *(Lepidochelys kempii)* was listed as endangered throughout its range on December 2, 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (FWS and NMFS, 1992; NMFS, 2000). The National Research Council's (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86% of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). It is estimated that before the implementation of Turtle Exclusion Devices (TEDs) the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NMFS, 2000). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and long lines.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54% (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, Styrofoam, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf of Mexico. Laws enacted during the late-1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products poses additional threats (Campbell, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). Dredging operations affect Kemp's ridley sea turtles through incidental take and by degrading the habitat. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through open bay placement of dredged material, degraded water quality/clarity, and altered current flow (FWS and NMFS, 1992).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results. Adult females also may avoid brightly lit areas that would otherwise provide suitable nesting sites (FWS, 1998). Also of concern are impacts to nesting sites due to vibration, sand compaction, sargassum piles, vehicular ruts and collisions with motor vehicles.

Today, under strict protection, the population appears to be in the early stages of recovery. Approximately 6,000 Kemp's ridley nests were recorded on Mexican beaches during the 2000 nesting season (Shaver, 2000). In 2001, 5,369 Kemp's ridley nests were recorded in Mexico, while in 2002 the number of nests rose to 6,326. As of mid-August 2003, 8,100 nests have been recorded in Mexico (Peña, 2003). More recent counts include approximately 10,000 nests in 2005, 12,000 in 2006, and 15,000 nests in 2007 (Shaver, personal correspondence, 2007). In addition, nesting on Texas beaches also continues to increase with the 2007 count, as of 8 August, totaling 128 confirmed nests. The increase likely can be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use TEDs in shrimp trawlers both in the U.S. and in Mexico (NMFS, 2000).

2.6.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, although rarely in bays, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on sargassum and associated infauna, and other epipelagic species of the Gulf of Mexico (FWS and NMFS, 1992). In some regions the blue crab *(Callinectes sapidus)* is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Shaver, 1991; Campbell, 1995).

2.6.3 Range

Adults are primarily restricted to the Gulf of Mexico, although juveniles may range throughout the Atlantic Ocean since they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

The majority of Kemp's ridleys nest on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, approximately 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz. Nesting has been documented from approximately 134 miles of the Tamaulipas coastline, and sporadic nesting has been reported from Bolivar Peninsula, Texas, southward to Isla Aquada, Campeche. There have been several isolated nesting attempts scattered from North Carolina to Colombia.

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched Rancho Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas (mainly) or Florida waters (Caillouet et al., 1993). This program has shown some results. The first nesting from one of these head started individuals occurred at Padre Island in 1996 and more nestings have occurred since (Shaver, 2000). A continuing program is still ongoing. Eggs from sea turtle nests found at Padre Island National Seashore and northward along the Texas coast are transported to the National Seashore's sea turtle incubation facility for protected care and monitoring. The hatchlings from the eggs are released at the northern end of Padre Island National Seashore when they emerge from their eggshells and become active (NPS, 2007).

2.6.4 Distribution in Texas

Kemp's ridley turtles occur in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. Additionally, there appear to be a population of Kemp's ridley turtles which remain in the northern gulf for longer periods of time. Females nesting on the Texas coast are remaining resident here offshore during the nesting season and to some extent later, according to turtles recently outfitted with radio receivers; one prior to 2006 and one in 2007 (Orms, 2008). Additionally, one of the males previously tracked in Mexican waters traveled to waters off the Texas coast. Studies also show that juvenile turtles use Texas areas extensively for foraging.

Kemp's ridley turtles have nested sporadically in Texas in the last 50 years and total number of nests has increased over the last decade. Nests were found near Yarborough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. From 1979 to 2007, 518 sea turtle nests were found on the Texas coast. Of the 518 nests, 454 were Kemp's ridley nests, 268 of which were found on PINS. In 1999, 16 confirmed Kemp's ridley nests were recorded in Texas, 12 nests were confirmed for 2000, 8 for 2001, 38 for 2002, 19 for 2003, 42 for 2004, 51 for 2005, and 102 for 2006 (PINS data). For the 2007 nesting season, there have been a total of 128 confirmed nests. Several of the ridley nests were from head-started individuals. Such nestings, together with the proximity of the Rancho Nuevo breeding ground, probably accounts for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1986, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection. Kemp's ridleys have been observed mating in the Mansfield Channel and, thus, could potentially mate in the nearby Laguna Madre and Gulf of Mexico.

2.6.5 Presence in the Project Area

Kemp's ridley turtles have been recorded in Willacy County, as well as in Nueces, Kleberg, Kenedy and Cameron counties (Dixon, 2000). Thus, this species could potential occur in the project area. During the 2006 nesting season, a total of 102 Kemp's ridley nests were documented along the Texas coast (NPS 2006), and a total of 128 Kemp's ridley nests were documented along the Texas coast during the 2007 nesting season (NPS, 2007). Kemp's ridley turtles are the only species to have nested in the proposed project area over the last five years; nest totals for the proposed project area are as follows (Shaver, personal correspondence, 2008):

Year	# Kemp's Ridley Nests
2003	0
2004	2
2005	1
2006	0
2007	2

2.6.6 Effects of the Project

The following discussion will be referenced for all sea turtles included in this BA. Section 7 consultation with NMFS concluded in their concurrence that endangered and threatened turtles in the aquatic environment will not be affected by this project. Activities will generally be carried out above the MHT, rather than in the water, and will therefore not significantly affect any aquatic environment.

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be directly vulnerable to the heavy machinery associated with beach maintenance activities. In addition, those activities could interfere with and/or prevent some turtles from attempting to nest. Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann, 1977; NMFS and U.S. Fish and Wildlife Service, 1991a, 1991b, 1992, 1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it difficult to find possible nests for protection. Ruts from vehicles can trap hatchlings and smaller stranded turtles and may result in death (Hosier et al., 1981; Fletemeyer, 1996, Ernest et al., 1998). Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer, 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Data is not available on the degree that compaction, resulting from vehicle use on the beach, either prevents or reduces nesting success.

Vibrations and noise caused by moving vehicles on the beach during beach maintenance operations could frighten nesting turtles, causing them to abandon their nesting attempt (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Vibrations could also harm incubating eggs. It is difficult to assess this possible impact since scientific data is lacking for the Kemp's ridley turtles' sensitivity to traffic vibrations or noise. Vibrations could affect sea turtles either during nest site selection after exiting the water or once the eggs are laid. Vibrations could cause sea turtles to abandon a nesting attempt resulting in a false crawl and causing a sea turtle to re-enter the water and nest in another location. Information suggests that turtles do not respond to vibrations once egg-laying has begun.

Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Regular beach maintenance removes debris, including non-natural items (e.g. plastics, beach chairs, old buoys) and large natural objects (e.g. tree trunks and sargassum), both of which wash ashore in large quantities and both of which can impede or prevent turtle nesting. At times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to four feet in height and 10 to 20 feet in width. The removal of this material , as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier and by providing a smooth crawlway.

Beach maintenance has the potential to kill emerging hatchling turtles from in situ nests not previously discovered by patrols. The hatchlings may be caught in seaweed which will be scraped up and either mounded or buried. While this is a potential effect of the project, it is not possible to quantify the potential impacts that may result from beach maintenance programs. While it is possible that a take may occur from operating in the sargassum areas where turtles may be trapped, it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

USFWS also suggests that a significant number of turtle mortalities may result from juvenile turtles getting trapped in the washed up sargassum (Orms, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality.

The applicant has stated that in the event that a turtle is discovered entangled in sargassum, the notification process described in Section 2.6.7 of this document will be followed.

2.6.7 Conservation Measures

This project may potentially impact Kemp's ridley turtles if they are present in the project area during beach maintenance activities. However, conservation measures and monitoring of beach maintenance activities by trained city employees and volunteers affiliated with the University of Texas Marine Science Institute (UTMSI) will help decrease the likelihood of impacts. UTMSI conducts volunteer turtle patrols daily from 1 April to 30 June, beginning around 6:30 am and concluding around 2:00 pm. The UTMSI patrols extend from the south from the south jetty at Aransas Pass Inlet past the southern border of the City of Port Aransas (approximately 7 miles, including the entire proposed project area. Trained City staff will monitor this stretch of beach beginning at 2:00 pm, when the UTMSI volunteers conclude their patrols, and will continue until 6:30 pm. In the event that there is a lapse in volunteer coverage, the volunteer coordinator at UTMSI will notify City staff so that they may reassign personnel to cover for the absent volunteer. The USACE intends to condition any permit issued to the City for this work to include provisions that require the City to do the following:

(1) The City will ensure that daily patrols are carried out from 15 March to 1 October for the entire 7-mile stretch of beach within the project area, beginning at 6:30 am and ending at 6:30 pm. If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the siting location, and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence within 100 feet of the nest site until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. The City has stated that its staff will honor this commitment to cease maintenance activities within 100 feet of the nest site for a period no greater than 3 hours. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City has stated that its staff will flag the nest area and recommence work, making sure that the nest site is avoided.

(2) The City will require all personnel involved in beach maintenance activities to receive training each year, prior to their involvement in cleaning activities, on how to recognize and avoid impacts to sea turtles, how to conduct the monitoring, and how to report any sitings to the proper authorities. All turtles, turtle nests, or turtle eggs found by monitors or reported to beach maintenance personnel will be safe-guarded by City staff until they can be relocated by the appropriate authorities. Ruts and berms in the beach created by city equipment will be smoothed out to no greater than 2 inches each day at the end of beach maintenance activities so that turtle tracks can be better identified and to prevent small turtles from becoming entrapped. The city will ensure that public education signs are posted at strategic locations in the project area. Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at Padre Island National Seashore. These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle siting occurs.

(3) In the event a take occurs, the City will immediately notify both the USACE, Corpus Christi Regulatory Office and the US Fish & Wildlife Service Corpus Christi Field Office. From the time that a take occurs until 15 July of that calendar year the City will be required to have a monitor present with each work crew, while machinery is in operation.

(4) Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the Corps of engineers for approval. This plan shall contain information on how the City will ensure compliance with the three preceding conditions. In addition, an annual follow-up report will be presented to the Corps prior to January 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

2.6.8 Conclusion

Despite an increase in nesting turtles within the project area, the risk to a Kemp's ridley sea turtle within the project area is still considered limited and will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. However, despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.7 HAWKSBILL SEA TURTLE

2.7.1 Reasons for Status

The hawksbill sea turtle *(Eretmochelys imbricata)* was Federally listed as endangered on June 2, 1970 (35 FR 8495), with critical habitat designated in Puerto Rico on May 24, 1978 (43 FR 22224). The greatest threat to this species is harvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices (recently $225/kilogram (kg)). Japanese imports of raw hawksbill shell (bekko) between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles. The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2000).

2.7.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they are typically found at depths of less than 70 feet. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter coastal waters when they reach a carapace length of approximately 8 to 10 inches. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2000).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish, fish, and plant material such as algae, submerged aquatic vegetation (SAV) and mangroves, which also have been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than the adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. They nest on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, these sand beaches are low energy with woody vegetation, such as sea grape *(Coccoloba uvifera),* near the waterline (NRC, 1990). The hawksbill is typically a solitary nester, which makes it harder to monitor nesting activity and success (NMFS, 2000).

2.7.3 Range

The hawksbill is circum-tropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas), south to Brazil (NMFS, 2000). In the continental U.S., the hawksbill nests only in Florida where it is sporadic at best (NFWL, 1980). However, a major nesting beach exists on Mona Island, Puerto Rico. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.7.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve post-hatchlings and juveniles, and sightings are primarily associated with stone jetties. These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2000).

2.7.5 Presence in the Project Area

The hawksbill has been recorded from Nueces, Kleberg, Willacy, and Cameron counties (Dixon, 2000). Although unlikely, it is of potential occurrence in the project area. On June 13, 1998 the first hawksbill nest recorded on the Texas coast was found outside the project area at Padre Island National Seashore (Shaver, 1998). It contained 140 eggs of which 133 hatched and 132 were released into the Gulf (one weak hatchling was taken to a rehabilitation facility). This nest remains the only example documented on the Texas coast.

2.7.6 Effects of the Project

Because most of the sightings of the hawksbill sea turtle in the northern Gulf of Mexico occur at stone jetties, this species could occur near the stone jetty at Aransas Pass Inlet, just north of the project area. However, no impacts to the hawksbill sea turtle from beach maintenance activities are expected due to the unlikelihood of this species nesting within the project area.

2.7.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above).

2.7.8 Conclusion

For the reasons cited in Section 2.6.8, the risk to a hawksbill sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the hawksbill sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the hawksbill sea turtle.

2.8 LEATHERBACK SEA TURTLE

2.8.1 Reasons for Status

The leatherback turtle *(Dermochelys coriacea)* was listed as endangered throughout its range on June 2, 1970 (35 FR 8495), with critical habitat designated in the U.S. Virgin Islands on September 26, 1978 and March 23, 1979 (43 FR 43688—43689 and 44 FR 17710—17712, respectively). Its decline is attributable to overexploitation by man and incidental mortality associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles have also been mentioned as causes for mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). Although nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change nesting beaches, current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide. The major threat is egg collecting, although they are also jeopardized to some extent by destruction or degradation of nesting habitat (NatureServe, 2000). Egg collecting is not currently a problem in Florida, but remains a problem in Puerto Rico and the U.S. Virgin Islands (NMFS and FWS, 1992). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped with turtle excluder devices (TEDs) because adult leatherbacks are too large to pass through the TED exit opening. While the TED exit opening size has been increased in the U.S., USFWS is unsure whether it has been increased in other countries. Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and FWS, 1992).

2.8.2 Habitat

The leatherback turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). It is most often found in coastal waters when nesting or following concentrations of jellyfish (TPWD, 2000), during which it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths.

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed (NFWL, 1980). The leatherback typically nests on beaches with a deepwater approach (Pritchard, 1971). No critical habitat has been designated within the project area.

2.8.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It is found in the Atlantic, Pacific and Indian oceans and occurs as far north as British Columbia, Newfoundland, Great Britain and Norway, as far south as Australia, Cape of Good Hope, and Argentina, and in other water bodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions and major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the Atlantic and Gulf states of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2000).

The leatherback migrates further and ventures further into colder water than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 3,666 miles to Ghana, West Africa, after nesting in Surinam (NMFS and FWS, 1992). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.8.4 Distribution in Texas

According to FWS (1981), leatherbacks have never been common in Texas waters. Leatherback turtles tend to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf of Mexico, the leatherback is often associated with two species of jellyfish, the cabbagehead *(Stomolophus* sp.) and the moon jellyfish *(Aurelia* sp.) (NMFS and FWS, 1992). Leatherback turtle feeding aggregations—large occurrences of 100 turtles—were reported by Leary (1957) off Port Aransas in December 1956 and in the Brownsville Eddy in winter (Hildebrand, 1983). No nests of this species have been recorded on Texas beaches for over 60 years. The last two reported, one from the late 1920s and one from the mid-1930s, were both from Padre Island (Hildebrand, 1982, 1986). Stranding records report 1 leatherback on the Texas coast in 2006 and 1 in 2007 (Orms, 2007).

2.8.5 Presence in the Project Area

The leatherback has been recorded from Nueces, Kenedy, and Cameron counties (Dixon, 2000). Although highly unlikely, the potential exists for this species to occur in the project area.

2.8.6 Effects of the Project

Of the five species of sea turtles occurring in Texas waters, the leatherback is the species least likely to be affected by the proposed project because of its rare occurrence on Texas beaches and its pelagic nature. No effects to this species are anticipated as a result of the project.

2.8.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the status and habitats of this species. Although leatherback sea turtle nesting is not expected to occur in the project area, the remote possibility still exists.

2.8.8 Conclusion

Based on the preceding analysis, the overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the leatherback sea turtle.

2.9 GREEN SEA TURTLE

2.9.1 Reasons for Status

The green sea turtle *(Chelonia mydas)* was listed on July 28, 1978 as threatened except for Florida and the Pacific coast of Mexico (including the Gulf of California), where it was listed as endangered (43 FR 32808). The greatest cause of decline in green sea turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch during commercial shrimp trawling is a continued source of mortality that adversely affects recovery. It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green sea turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and subadults. Various other fishing operations also negatively impact this species (NMFS, 2000). Epidemic outbreaks of fibropapilloma or "tumor" infections recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). Some scientists suspect this disease to be linked to environmental alteration of sea turtle habitat by pollution and contaminants (FWS, 1998). This species is also subject to various negative impacts shared by sea turtles in general. According to Donna Shaver, an additional significant threat to the green sea turtle's survival is hypothermic stunning (Orms, 2008).

2.9.2 Habitat

The green sea turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and submerged aquatic vegetation (SAV). Individuals observed in the open ocean are believed to be migrants en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. Adults are primarily herbivorous, while juveniles consume more invertebrates. Principal food items include SAV, macroalgae and other marine plants, mollusks, sponges, crustaceans, and jellyfish (Mortimer, 1982; Green, unpubl. data).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galapagos Islands, green sea turtles have been observed basking on beaches (Balazs, 1980; Green, unpubl. data). They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994), although an individual might switch to a different nesting beach within a single nesting season (Green, unpubl. data).

2.9.3 Range

The green sea turtle is a circum-global species in tropical and sub-tropical waters. In U.S. Atlantic waters, it is found around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Ayes Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and FWS, 1991b; Hirth, 1997). Nesting numbers are increasing rapidly in Florida and Mexico (Orms, 2008).

2.9.4 Distribution in Texas

The green sea turtle in Texas inhabits shallow bays, rock passes, and estuaries where its principal foods, the various marine grasses and other SAV, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid to late nineteenth century, Texas waters supported a green sea turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the Lower Laguna Madre, although a few also came from Galveston Bay. They have also been documented in large numbers at Packery, Mansfield and Brazos Santiago Pass and observed at Fish Pass and at the Port Aransas Jetties (Orms, 2008). Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, with the last Texas turtler hanging up his nets in 1935. Incidental catches by fisherman and shrimpers were sometimes marked prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Reduced numbers of green sea turtles can still be found in these same bays today (Hildebrand, 1982). Although numbers of green turtles are much reduced over historic figures, their numbers are now starting to increase. While green sea turtles prefer to inhabit bays with SAV meadows, they may also be found in bays that are devoid of SAV. The green sea turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Green sea turtle nests are rare in Texas. Of the 518 turtle nests found on the Texas coast between 1979 and 2007, 21 were green sea turtle nests, all of which were found outside the project area on PINS and one on South Padre Island. This includes three in 2007 outside the project area including two within PINS and one on South Padre Island. Also included (all at PINS) are two in 2006, 4 in 2005, 1 in 2004, 2 in 2003, 2 in 2002, and 1 in 2000. Observed juveniles are likely from Mexico and may return there to nest. There is a possibility that increased nesting of these juveniles in Texas could occur (Orms, 2008).

2.9.5 Presence in the Project Area

The green sea turtle has been recorded from Nueces, Kleberg, Kenedy, Willacy and Cameron counties (Dixon, 2000). There is potential for this species to occur in the project area, but individuals are most likely to be in transit through Aransas Pass Inlet en route to the back bays west of the project area. In Texas (Shaver, 2000, unpublished data), green sea turtle nests have only been documented at Padre Island National Seashore, south of the project area.

2.9.6 Effects of the Project

Because most of the sightings of the green sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the proposed project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities may could impact nesting green sea turtles.

2.9.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above).

2.9.8 Conclusion

For the reasons cited in Section 2.6.8, the risk to green sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.10 LOGGERHEAD SEA TURTLE

2.10.1 Reasons for Status

The loggerhead sea turtle *(Caretta caretta)* was listed as threatened throughout its range on July 28, 1978 (43 FR 32808). The decline of the loggerhead, like that of most sea turtles, can be attributed to overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predatation. The most significant threats to its population are coastal development, commercial fisheries, and pollution (NMFS, 2000).

2.10.2 Habitat

The loggerhead is found in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers. It favors warm temperate and sub-tropical regions not far from shorelines. The adults occupy various habitats, from turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching, and often float in masses of sargassum. They may remain associated with sargassum for 3 to 5 years (NMFS and FWS, 1991b).

Commensurate with their use of varied habitats, loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conch, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Rebel, 1974; Hughes, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

Nesting occurs usually on open, sandy beaches above high-tide mark and seaward of well developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and sub-tropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995). No critical habitat has been designated for this species.

2.10.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf coast. In recent years, a few have nested on barrier islands along the Texas coast.

2.10.4 Distribution in Texas

The loggerhead is considered to be the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It is also the species most commonly sighted around offshore oil rig platforms and reefs and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when one of their food items, the Portuguese man-of-war, is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths are due to the activities of shrimp trawlers where turtles are accidentally caught in the nets and drown and their bodies dumped overboard. Prior to 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, five were confirmed in 2000, three in 2001, one in 2002, two in 2006 and 5 in 2007(Shaver, 2000, 2002, 2007). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were marketed (Hildebrand, 1982). Today, even with protection, insufficient loggerheads exist to support a fishery.

2.10.5 Presence in the Project Area

The loggerhead has been recorded in Nueces County and in Kleberg County (Dixon, 2000) and in Corpus Christi Bay (Shaver, 2000). There is potential for this species to occur in the project area. Of the 516 sea turtle nests found on the Texas coast between 1979 and July 2007, 43 were loggerhead sea turtle nests, of which 32 were found on PINS. During the last decade, nesting has remained stable on the Texas coast at 1-5 nests per year, the majority of which occur on the Padre Island National Seashore, south of the project area.

2.10.6 Effects of the Project

Because most of the sightings of the loggerhead sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities could impact nesting loggerheads sea turtles.

2.10.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above).

2.10.8 Conclusion

For the reasons cited in Section 2.6.8, the risk to loggerhead sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.11 SOUTH TEXAS AMBROSIA

2.11.1 Reasons for Status

The South Texas Ambrosia became listed as endangered on September 23, 1994 (50 CFR Part 17). Loss of habitat has led to the decline of this species. Conversion of habitat to agricultural fields and urban areas has limited the amount of habitat available for colonization. In addition, introduced species such as buffelgrass *(Cenchrus ciliaris)* and King Ranch bluestem *(Bothriochloa ischaemum var. songaricus)* compete with this and other natives of the coastal prairie. Invasion of prairie by shrub and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. Disturbance associated with activities occurring along road right-of-ways where the species is found may also be detrimental.

2.11.2 Habitat

South Texas ambrosia grows and blooms at low elevations in open clay-loam prairies and savannas among *Ayenia limitaris*, *Buchloe dactyloides*, *Stipa leucotricha* and *Bouteloua rigidiseta*. South Texas ambrosia was first collected in San Fernando, Tamaulipas, Mexico, by Luis Berlandier in 1835. The first U.S. collection was made by Robert Runyon in 1932 in Cameron County, Texas. It has since been found in Cameron, Jim Wells, Kleberg and Nueces Counties in South Texas. Six populations are known to exist in Nueces and Kleberg counties. No critical habitat has been designated for this species.

2.11.3 Range

South Texas ambrosia is known only from the southern tip of Texas and from Tamaulipas, Mexico (Correll and Johnston, 1970; Turner, 1983). It was first collected by J.L. Berlandier in San Fernando, Tamaulipas, Mexico in 1835 (Turner, 1983), but it was not until 1859 that Gray described this species as new to science. Historically, South Texas ambrosia was known only from Kleberg, Nueces, Jim Wells, and Cameron counties in the Gulf Prairie region of Texas and Tamaulipas in Mexico. The status of the Mexican populations is unknown.

2.11.4 Distribution in Texas

This species has been historically reported from Jim Wells and Cameron counties, although it is currently verified in six general locations in Nueces and Kleberg counties (TPWD, 1999a).

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2.11.5 Presence in the Project Area

The South Texas Ambrosia is limited to coastal prairies with clayey soil and therefore would not be found in the project area, which is located totally on a sandy beach.

2.11.6 Effects of the Project

No effects to the South Texas Ambrosia are anticipated as a result of this project.

2.11.7 Conservation Measures

Because no potential effects to the South Texas Ambrosia will occur as a result of the proposed project, no additional conservation measures are needed.

2.11.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the South Texas Ambrosia.

2.12 WEST INDIAN MANATEE

2.12.1 Reasons for Status

The West Indian manatee *(Trichechus manatus)* was listed as endangered on June 2, 1970 (35 FR 8495). The largest known human-related cause of manatee mortality in Florida is collisions with hulls and/or propellers of boats and ships. The second-largest human-related cause of mortality in Florida is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (FWS, 1993). Hunting and fishing pressures were responsible for much of its original decline, as manatees were heavily hunted for meat, hides, and bones until they were nearly extirpated (FWS, 1995a).

A prominent cause of natural mortality in some years in Florida is cold stress. Major die-offs associated with the outbreaks of red tide have occurred, where manatees appear to have died due to ingestion of filter-feeding tunicates (incidentally ingested by manatees feeding on seagrasses) that had accumulated the neurotoxin-producing dynoflagellates responsible for causing the red tide (FWS, 1993; 1995b). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

2.12.2 Habitat

The manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range it appears to prefer rivers and estuaries to marine habitats, although manatees inhabit marine habitats in the Greater Antilles (Lefebvre et al., 1989). It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 20°C. In the northern portions of their range during October through April they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power plants. They prefer waters that are at least 3.3 to 6.6 feet in depth; along coasts they are often in water 9.9 to 16.5 feet deep. They usually avoid areas with strong currents (NatureServe, 2000).

Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability. They may opportunistically eat other foods such as acorns in early winter in Florida or fish caught in gill nets in Jamaica (O'Shea and Ludlow, 1992).

2.12.3 Range

The manatee ranges from the southeastern U.S. and coastal regions of the Gulf of Mexico, through the West Indies and Caribbean, to northern South America. United States populations occur primarily in Florida (NatureServe, 2000), where they are effectively isolated from other populations by the cooler waters of the northern Gulf of Mexico and the deeper waters of the Straits of Florida (Domning and Hayek, 1986).

2.12.4 Distribution in Texas

Manatees are extremely rare in Texas, although in the late 1800s they apparently were not uncommon in the Laguna Madre. Recent Texas records also include specimens from Cameron, Willacy, Galveston, and Matagorda counties (FWS, 1995a); Davis and Schmidly (1994) describe a Texas record of a manatee found dead in the surf near Bolivar Peninsula near Galveston in 1986. Manatees may travel great distances (200 km or more) along the coast or between islands (FWS, 1995a). In the Corpus Christi Bay area, a manatee was sighted at Fish Pass on October 2, 1979 and another near the Naval Air Station in October and November 1995 (Price-May, 2002). Albert Oswald of the Texas State Aquarium spotted a manatee in the inlet between the Texas State Aquarium and the Lexington Museum on September 23, 2001. This is the third and probably most reliable sighting of the manatee in Corpus Christi Bay (Beaver, 2001). More recently in 2005, a manatee was spotted throughout the month of May in the Port Mansfield Harbor (KGBT Channel 4, 2005) and April 2006 (Wilson, 2006).

2.12.5 Presence in the Project Area

The manatee has been spotted in the Corpus Christi Bay area, and though highly unlikely, may access waters adjacent to the project area by way of Aransas Pass Inlet.

2.12.6 Effects of the Project

While the West Indian manatee has been recently sighted in back bay habitats to the southwest of the project area, such occurrences are extremely rare, and the likelihood that any individuals would end up in the waters adjacent to proposed project area is extremely unlikely. Regardless, the proposed activities will not affect aquatic habitats and thus have no potential to affect the

West Indian manatee.

2.12.7 Conservation Measures

Because no potential effects to the West Indian manatee are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.12.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the West Indian manatee.

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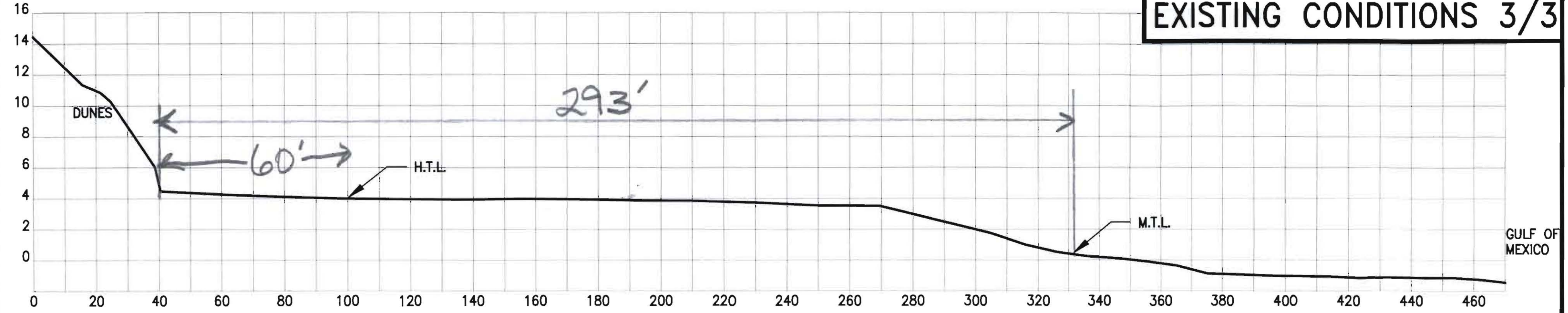
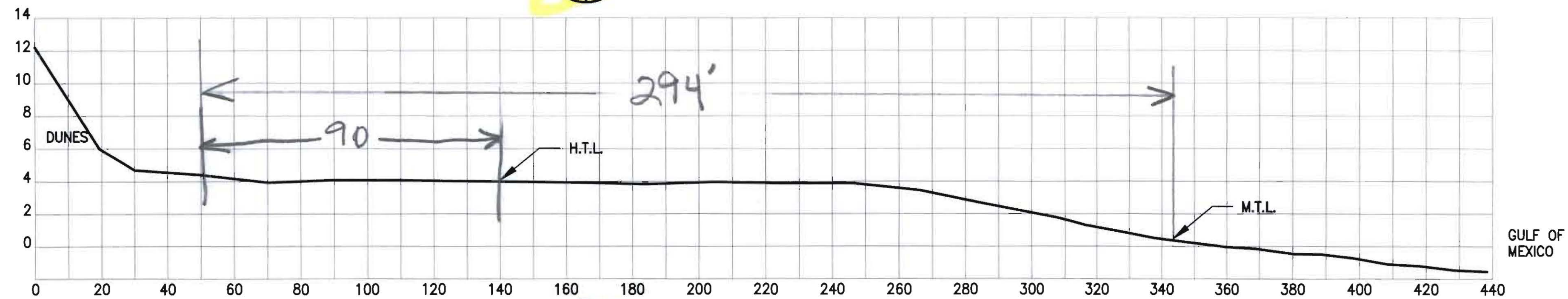
EXISTING CONDITIONS 3/3



5 | 1 | 5 EXISTING CONDITIONS – SECTION

SCALE: GRAPHIC *SEE SHEETS 6 THROUGH 8 FOR PROPOSED MAINTENANCE



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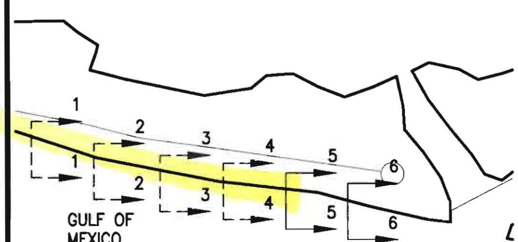


NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR/SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 5 IS LOCATED AT MARKER 10 LOOKING NORTH.
4. SECTION 6 IS LOCATED SOUTH OF LANTANA DRIVE BY DUNES CONDOMINIUM.

HORIZONTAL 0 25' 50'

VERTICAL 0 5' 10'

FOR COE USE ONLY

Permit Application No.:

Applicant Name:

Sheet ____ of ____

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 08/07 | REV. DATE: 4-29-08 | DATUM: NAVD'88

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 05 of 08

HDR | SHINER MOSELEY

October 6, 2008 66107

Mr. Regan Richter
U.S. Army Corps of Engineers
Corpus Christi Regulatory Branch
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411

RE: BEACH SURVEY RESULTS FROM OCTOBER 3, 2008 STUDY, PORT ARANSAS, NUECES COUNTY, TX

Dear Mr. Richter,

Upon your request, the City of Port Aransas contracted HDR Engineering, Inc. to re-survey beach elevations for a stretch of maintained beach on Mustang Island, Nueces County, TX. This area was previously surveyed by HDR Engineering, Inc. on January 16, 2008 at the request of the City of Port Aransas in order to establish the Annual High Tide Line (AHTL) for beach maintenance purposes. Please find the results of the October 3 survey of the area between mile marker 7 and mile marker 20 in the enclosed report by the head of the survey crew, George Rubalacaba, P.E., R.P.L.S.

The HDR survey staff also revisited the tide data from Blucher TCOON site for the period from January 1, 1997 to December 31, 2007 in order to re-calculate the elevation of the AHTL. As detailed in the attached report, the survey crew discovered that the previously reported elevation (4.0' NAVD'88) reflected a datum error. This elevation should have been labeled 4.0' USACE Mean Low Tide (MLT), which corresponds to 2.62' NAVD'88. A complete description of the calculations and methodology used to rectify this mistake are included in the attached report. A corrected elevation for the AHTL was used during the October 3rd survey.

We will submit supplemental findings, including cross sectional views of beach profiles from the recently surveyed area, very shortly. In the interim, please contact me directly at (361) 696-3362 or at jeffrey.pollack@hdrinc.com with any questions.

Sincerely,

HDR ENGINEERING, INC.

Jeffrey Pollack
Environmental Scientist

JAP/dgl

Enclosures: Surveyor's Report

HDR | SHINER MOSELEY

66107 **October 6, 2008**

SURVEYOR'S REPORT ON ANNUAL HIGH TIDE LINE SURVEY AT PORT ARANSAS BEACH

This report is to summarize the activities related to the establishment of the Annual High Tide Line at the Port Aransas beach area between Mile Markers 7 and Mile Marker 20.

Definition of Annual High Tide Line per the Federal Register in Part 326, Section 328.3 is the line of intersection of the land with the water's surface at the maximum height reached by a rising tide and encompasses spring high tides and other high tides that occur with periodic frequency, but does not include storm surges.

To obtain the Annual High Tide for this area, the tidal information for the tide gauge at Port Aransas was obtained from the Blucher TCOON site for the period from January 1, 1997 to December 31, 2007. Copies of these graphs are attached to this report. The average of the highest tides for the 11 year period was then averaged and determined to be 2.56' NAVD'88. Unfortunately, on our previous submittal of the survey conducted for this area from Mile Marker 0 to Mile Marker 18, the Annual High Tide was converted to Corps of Engineers Mean Low Tide which comes out to be 4', which is equivalent to an elevation of 2.62' NAVD'88, but 4' was inadvertently labeled as being NAVD'88 instead of MLT. This oversight, after correction, moves the Annual High Tide Line more gulfward than was previously shown.

The survey conducted on Friday, October 3, 2006, was done using the corrected elevation of 2.56' NAVD'88 for the Annual High Tide Line and a plan view of this survey showing the location of this line relative to the line of timber bollards and the gulfside toe of the dunes is also attached to this report.

Copies of the control used, as well as the field notes and point data are also attached for additional information.

Respectfully submitted,

George Rubalcaba, RPLS, LSLS

HDR Engineering, Inc.
555 N Carancahua
Suite 1650
Corpus Christi, TX 78478-0010
Phone (361) 857-2211
Fax (361) 857-7234
www.hdrinc.com

City of Port Aransas

Beach Sections

Mile Markers

7 THRU 20

No.	Description			
1	PK in post OCP1		HI = 3'	
2	OCP1A			
3-11	MM 20			
12-24	MM 19		#19 @ Bollard	
25-40	MM ~~20~~ 18		#30 " "	
41-56	MM 17		#46 " "	
57-74	MM 16		#64 " "	#69 [illegible]
75-89	MM 15		#80 " "	#85 "
90-105	MM 14		#96 " "	#102
106-122	MM 13		#111 " "	#118
123-140	MM 12		#128 " "	#136
141-156	MM 11		#147 " "	#152
157-173	MM 10		#164 " "	#170
174-191	MM 9		#181 " "	
192-205	MM 8		#198 " "	
206-224	MM 7		#214 " "	
225	Monument SF010			

Photo	Desc	Looking	
1	MM 7	SW @	Post Erosion
2	"	SW @	MM 7
3	"	S @	Beach
4	MM 10	SW @	Post 0.6' Erosion
5	"	SW @	MM 10
6	"	S @	Beach
13	MM 20	N @	Beach

H. Martinez

Sunny, [illegible]

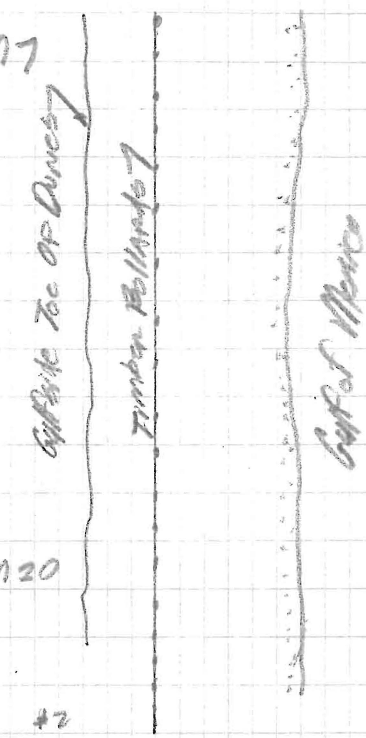
#225 Monument SF010

MM 7

Note: Elevations Are NAVD'88
Coordinates Are Tx. St. Plane NAD'83
Tx. South Zone

APPROX. N. LIMITS OF WORK

MM 20



#2

#1 N 13,173,483.18
E 1,444,576.82
Elev. 9.69

Photo	Description	Looking	
7	MM 15	SW	0.5'
8		SW	
9		S	
10	MM 18	SW	0.5
11		SW	
12		S	

66107 - City of Port Aransas

Point Report
Project Name: J:\SMACAD\Projects\2007\66107\dwg\01\66107-00-T1.dwg
Report Date: 10/6/2008 3:27:12 PM

Client:
Project Description:
Prepared by:

Point Report

Project: J:\SMACAD\Projects\2007\66107\dwg\01\66107-00-T1.dwg

Total COGO Points:450

Number	Northing (ft)	Easting (ft)	Elevation (ft)	Description
1	17179488.18	1441576.82	9.69	BCP1
2	17179829.35	1441759.89	7.20	BCP1A
3	17182088.51	1443571.31	6.22	MM20NG
4	17182078.91	1443588.78	5.18	MM20NG
5	17182067.54	1443604.52	4.50	MM20NG
6	17182057.25	1443620.48	3.94	MM20NG
7	17182046.62	1443637.04	3.32	MM20NG
8	17182036.81	1443654.82	2.76	MM20NG
9	17182030.27	1443666.41	2.48	MM20NG
10	17182020.64	1443683.95	2.77	MM20NG
11	17182010.74	1443704.26	1.32	MM20NG
12	17182571.41	1443820.19	9.21	MM19NG
13	17182560.89	1443837.08	7.81	MM19NG
14	17182550.14	1443858.87	6.63	MM19NG
15	17182546.67	1443863.94	7.95	MM19NG
16	17182543.77	1443868.28	5.73	MM19NG
17	17182533.49	1443885.42	5.04	MM19NG
18	17182523.06	1443902.93	4.69	MM19NG
19	17182506.69	1443927.68	4.26	MM19NG
20	17182494.33	1443943.95	3.76	MM19NG
21	17182485.44	1443961.27	3.29	MM19NG
22	17182476.10	1443979.34	2.64	MM19NG
23	17182465.81	1443993.21	2.86	MM19NG
24	17182455.36	1444007.66	0.98	MM19NG

25	17183008.77	1444107.08	8.70	MM18NG
26	17182999.12	1444118.92	8.37	MM18NG
27	17182995.47	1444124.38	5.53	MM18NG
28	17182984.92	1444140.83	5.32	MM18NG
29	17182973.73	1444156.37	5.34	MM18NG
30	17182965.07	1444167.19	5.54	MM18NG
31	17182950.98	1444182.90	4.75	MM18NG
32	17182937.30	1444197.90	4.31	MM18NG
33	17182924.12	1444213.30	4.05	MM18NG
34	17182913.00	1444229.10	4.54	MM18NG
35	17182900.30	1444245.09	4.49	MM18NG
36	17182887.93	1444260.83	4.00	MM18NG
37	17182875.25	1444278.91	3.02	MM18NG
38	17182868.39	1444287.91	2.68	MM18NG
39	17182860.84	1444298.89	2.90	MM18NG
40	17182850.35	1444313.04	1.10	MM18NG
41	17183503.81	1444441.35	7.88	MM17NG
42	17183492.20	1444457.03	6.83	MM17NG
43	17183481.13	1444472.42	5.63	MM17NG
44	17183466.69	1444489.99	5.39	MM17NG
45	17183453.27	1444508.07	4.85	MM17NG
46	17183442.87	1444521.85	4.59	MM17NG
47	17183428.23	1444540.94	4.18	MM17NG
48	17183414.69	1444560.28	3.93	MM17NG
49	17183399.95	1444579.46	4.43	MM17NG
50	17183394.19	1444586.98	5.31	MM17NG
51	17183387.56	1444595.32	5.57	MM17NG
52	17183383.94	1444598.06	4.29	MM17NG
53	17183371.94	1444615.42	3.41	MM17NG
54	17183359.28	1444633.57	2.61	MM17NG
55	17183349.39	1444646.02	2.71	MM17NG
56	17183337.04	1444663.60	0.75	MM17NG
57	17183934.60	1444747.67	8.47	MM16NG
58	17183921.72	1444762.44	7.36	MM16NG
59	17183916.88	1444769.59	7.12	MM16NG
60	17183909.34	1444778.04	5.93	MM16NG
61	17183898.19	1444794.52	5.70	MM16NG
62	17183887.00	1444810.87	5.48	MM16NG
63	17183874.66	1444826.83	5.24	MM16NG
64	17183865.89	1444835.51	5.01	MM16NG

65	17183853.43	1444852.83	4.90	MM16NG
66	17183839.69	1444869.57	4.48	MM16NG
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69	17183807.60	1444910.13	4.55	MM16NG
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72	17183766.14	1444958.98	2.64	MM16NG
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74	17183742.68	1444987.91	0.69	MM16NG
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76	17184294.15	1445050.88	6.80	MM15NG
77	17184283.48	1445063.71	5.82	MM15NG
78	17184268.74	1445081.25	5.33	MM15NG
79	17184254.78	1445098.21	4.90	MM15NG
80	17184241.89	1445114.32	4.55	MM15NG
81	17184227.83	1445132.32	4.41	MM15NG
82	17184214.27	1445149.87	4.09	MM15NG
83	17184199.81	1445168.02	3.90	MM15NG
84	17184185.99	1445185.77	3.78	MM15NG
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87	17184148.57	1445233.44	2.46	MM15NG
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148	17185949.71	1446458.00	4.27	MM11NG
149	17185935.37	1446476.65	4.02	MM11NG
150	17185921.37	1446494.08	3.79	MM11NG
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152	17185894.35	1446527.71	2.97	MM11NG
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163	17186506.27	1446846.16	4.87	MM10NG
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176	17186918.93	1447053.17	7.31	MM9NG
177	17186910.03	1447066.78	6.26	MM9NG
178	17186898.16	1447082.69	5.77	MM9NG
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182	17186845.02	1447159.22	4.16	MM9NG
183	17186829.49	1447179.44	3.95	MM9NG
184	17186817.77	1447196.78	3.54	MM9NG

185	17186804.40	1447214.18	3.07	MM9NG
186	17186789.97	1447232.20	2.52	MM9NG
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188	17186764.79	1447266.70	1.16	MM9NG
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191	17186731.00	1447312.23	0.54	MM9NG
192	17187400.36	1447440.96	6.63	MM8NG
193	17187394.61	1447448.86	5.11	MM8NG
194	17187381.75	1447464.40	5.30	MM8NG
195	17187369.43	1447481.10	4.96	MM8NG
196	17187357.82	1447497.24	4.62	MM8NG
197	17187344.66	1447514.35	4.25	MM8NG
198	17187335.47	1447527.31	4.17	MM8NG
199	17187320.25	1447545.57	3.76	MM8NG
200	17187305.86	1447562.11	3.31	MM8NG
201	17187291.72	1447578.64	2.82	MM8NG
202	17187282.92	1447590.95	2.52	MM8NG
203	17187274.28	1447602.59	2.78	MM8NG
204	17187261.86	1447618.74	0.81	MM8NG
205	17187250.16	1447635.49	0.46	MM8NG
206	17187805.25	1447754.51	8.67	MM7NG
207	17187798.70	1447760.29	7.80	MM7NG
208	17187794.00	1447764.80	5.30	MM7NG
209	17187782.27	1447778.79	5.10	MM7NG
210	17187770.69	1447791.93	5.10	MM7NG
211	17187757.18	1447806.81	4.97	MM7NG
212	17187741.98	1447821.47	4.53	MM7NG
213	17187730.71	1447834.94	4.34	MM7NG
214	17187714.73	1447852.08	3.95	MM7NG
215	17187699.74	1447869.11	3.65	MM7NG
216	17187684.42	1447885.86	3.23	MM7NG
217	17187663.16	1447900.84	2.64	MM7NG
218	17187653.95	1447919.87	2.27	MM7NG
219	17187645.16	1447935.59	2.53	MM7NG
220	17187635.11	1447947.89	1.06	MM7NG
221	17187622.24	1447959.98	0.61	MM7NG
222	17187616.10	1447969.74	1.23	MM7NG
223	17187602.25	1447987.52	1.29	MM7NG
224	17187589.92	1448003.71	0.54	MM7NG

225	17185005.83	1441717.00	8.09	BMON

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE =  ,PROGRAM = datasheet, VERSION = 7.61
1        National Geodetic Survey,   Retrieval Date = OCTOBER  3, 2008
 AH1674 ***********************************************************************
 AH1674  SACS         -  This is a Secondary Airport Control Station.
 AH1674  DESIGNATION -  SF 010
 AH1674  PID         -  AH1674
 AH1674  STATE/COUNTY-  TX/NUECES
 AH1674  USGS QUAD   -  PORT ARANSAS (1975)
 AH1674
 AH1674                        *CURRENT SURVEY CONTROL
 AH1674
 AH1674* NAD 83(2007)-  27 48 27.78461(N)    097 05 05.56195(W)     ADJUSTED
 AH1674* NAVD 88     -         2.466  (meters)          8.09    (feet)  ADJUSTED
 AH1674
 AH1674  EPOCH DATE  -       2002.00
 AH1674  X           -    -696,334.633 (meters)                        COMP
 AH1674  Y           -  -5,602,563.469 (meters)                        COMP
 AH1674  Z           -   2,957,663.292 (meters)                        COMP
 AH1674  LAPLACE CORR-            1.17  (seconds)                      DEFLEC99
 AH1674  ELLIP HEIGHT-         -23.854 (meters)           (02/10/07) ADJUSTED
 AH1674  GEOID HEIGHT-          -26.27  (meters)                       GEOID03
 AH1674  DYNAMIC HT  -           2.462 (meters)       8.08   (feet)  COMP
 AH1674
 AH1674  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 AH1674  Type    PID    Designation                      North   East  Ellip
 AH1674  -------------------------------------------------------------------
 AH1674  NETWORK AH1674 SF 010                            0.31   0.29   1.00
 AH1674  -------------------------------------------------------------------
 AH1674  MODELED GRAV-     979,144.8   (mgal)                      NAVD 88
 AH1674
 AH1674  VERT ORDER  -  FIRST     CLASS II
 AH1674
 AH1674.This mark is at Mustang Beach Airport (2R8)
 AH1674
 AH1674.The horizontal coordinates were established by GPS observations
 AH1674.and adjusted by the National Geodetic Survey in February 2007.
 AH1674
 AH1674.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 AH1674.See National Readjustment for more information.
 AH1674.The horizontal coordinates are valid at the epoch date displayed above.
 AH1674.The epoch date for horizontal control is a decimal equivalence
 AH1674.of Year/Month/Day.
 AH1674
 AH1674.The orthometric height was determined by differential leveling
 AH1674.and adjusted in December 1997.
 AH1674
 AH1674.Photographs are available for this station.
 AH1674
 AH1674.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AH1674
 AH1674.The Laplace correction was computed from DEFLEC99 derived deflections.
 AH1674
 AH1674.The ellipsoidal height was determined by GPS observations
 AH1674.and is referenced to NAD 83.
 AH1674
 AH1674.The geoid height was determined by GEOID03.
 AH1674
```

```
AH1674.The dynamic height is computed by dividing the NAVD 88
AH1674.geopotential number by the normal gravity value computed on the
AH1674.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AH1674.degrees latitude (g = 980.6199 gals.).
AH1674
AH1674.The modeled gravity was interpolated from observed gravity values.
AH1674
AH1674;                    North         East     Units Scale Factor Converg.
AH1674;SPC TX S     - 5,238,000.382   439,436.495   MT  0.99999362   +0 38 32.9
AH1674;SPC TX S     -17,185,006.25  1,441,717.90   sFT  0.99999362   +0 38 32.9
AH1674;SPC TXSC     - 3,998,706.183   788,740.383   MT  1.00021491   +0 56 17.7
AH1674;SPC TXSC     -13,119,088.54  2,587,725.74   sFT  1.00021491   +0 56 17.7
AH1674;UTM  14      - 3,077,373.790   688,652.762   MT  1.00003930   +0 53 37.2
AH1674
AH1674!             -  Elev Factor  x  Scale Factor =   Combined Factor
AH1674!SPC TX S     -   1.00000375  x   0.99999362  =   0.99999737
AH1674!SPC TXSC     -   1.00000375  x   1.00021491  =   1.00021866
AH1674!UTM  14      -   1.00000375  x   1.00003930  =   1.00004305
AH1674
AH1674:              Primary Azimuth Mark                        Grid Az
AH1674:SPC TX S     -  2R8 A                                     316 37 29.3
AH1674:SPC TXSC     -  2R8 A                                     316 19 44.5
AH1674:UTM  14      -  2R8 A                                     316 22 25.0
AH1674
AH1674|---------------------------------------------------------------------|
AH1674| PID    Reference Object                     Distance      Geod. Az  |
AH1674|                                                           dddmmss.s |
AH1674| DF6357 2R8 A                               APPROX. 0.5 KM 3171602.2 |
AH1674|---------------------------------------------------------------------|
AH1674
AH1674                          SUPERSEDED SURVEY CONTROL
AH1674
AH1674  NAD 83(1993)-  27 48 27.78448(N)    097 05 05.56210(W) AD(       ) 1
AH1674  NAD 83(1993)-  27 48 27.78450(N)    097 05 05.56208(W) AD(       ) 1
AH1674  ELLIP H (07/14/03)  -23.847  (m)                       GP(       ) 3 1
AH1674  ELLIP H (07/14/03)  -23.846  (m)                       GP(       ) 3 1
AH1674  ELLIP H (06/17/02)  -23.692  (m)                       GP(       ) 5 1
AH1674  NAD 83(1993)-  27 48 27.78117(N)    097 05 05.57236(W) AD(       ) 1
AH1674  ELLIP H (02/16/96)  -23.563  (m)                       GP(       ) 5 1
AH1674  NAD 83(1986)-  27 48 27.78743(N)    097 05 05.55202(W) AD(       ) 1
AH1674  NAVD 88 (07/14/03)    2.47   (m)            8.1    (f) LEVELING    3
AH1674  NGVD 29 (04/09/92)    2.8    (m)            9.     (f) GPS OBS
AH1674
AH1674.Superseded values are not recommended for survey control.
AH1674.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AH1674.See file dsdata.txt to determine how the superseded data were derived.
AH1674
AH1674_U.S. NATIONAL GRID SPATIAL ADDRESS: 14RPR8865377374(NAD 83)
AH1674_MARKER: DD = SURVEY DISK
AH1674_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AH1674_SP_SET: METAL ROD DRIVEN INTO GROUND
AH1674_STAMPING: SF-010
AH1674_MARK LOGO: TX1550
AH1674_PROJECTION: FLUSH
AH1674_MAGNETIC: N = NO MAGNETIC MATERIAL
AH1674_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
AH1674_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AH1674+SATELLITE: SATELLITE OBSERVATIONS - February 05, 2004
AH1674_ROD/PIPE-DEPTH: 3.10 meters
AH1674
AH1674  HISTORY     - Date     Condition        Report By
AH1674  HISTORY     - 1991     MONUMENTED       TX1550
AH1674  HISTORY     - 19970204 GOOD             NGS
AH1674  HISTORY     - 19970725 GOOD             USPSQD
```

```
AH1674  HISTORY     - 20030419 GOOD             NGS
AH1674  HISTORY     - 20030425 GOOD             NGS
AH1674  HISTORY     - 20040205 GOOD             NGS
AH1674
AH1674                          STATION DESCRIPTION
AH1674
AH1674'DESCRIBED BY CITY OF CORPUS CHRISTI TEXAS 1991
AH1674'IN CORPUS CHRISTI, APPROX. 0.4 MI (0.6 KM) W. OF THE INTERSECTION OF
AH1674'PARK RD. 53 AND PIPER ROAD. 21.4 FT (6.5 M) S. OF CURB, 24.2 FT
AH1674'(7.4 M) E. OF DRIVEWAY TO SANITARY SEWER LIFT STATION, 50.3 FT
AH1674'(15.3 M) SE OF SANITARY SEWER MANHOLE IN CENTER OF PIPER RD.
AH1674'MONUMENT IS A BRASS DISK ON TOP OF STEEL ROD STAMPED SF010. ACCESS
AH1674'THROUGH A HINGED COVER.
AH1674
AH1674                          STATION RECOVERY (1997)
AH1674
AH1674'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1997 (GAS)
AH1674'3.1 KM (1.90 MI) SOUTHERLY ALONG ALISTER STREET AND STATE HIGHWAY 361
AH1674'FROM THE POST OFFICE IN PORT ARANSAS, THENCE 0.3 KM (0.20 MI) WESTERLY
AH1674'ALONG PIPER BOULEVARD, 15.3 M (50.2 FT) SOUTH OF THE CENTER OF A
AH1674'MANHOLE COVER, 12.5 M (41.0 FT) SOUTHWEST OF THE BOULEVARD CENTERLINE,
AH1674'8.9 M (29.2 FT) SOUTHEAST OF THE CENTER OF A DRIVEWAY LEADING TO A
AH1674'PUMPING STATION, 6.6 M (21.7 FT) NORTHWEST OF UNDERGROUND CABLE
AH1674'JUNCTION BOX NUMBER 5030 1, 0.6 M (2.0 FT) ABOVE THE LEVEL OF THE
AH1674'BOULEVARD, AND 0.3 M (1.0 FT) NORTHEAST OF A WITNESS POST.  NOTE--ROD
AH1674'WAS DRIVEN 3.1 M (10.2 FT).  NOTE--ACCESS TO THE DATUM POINT IS
AH1674'THROUGH A 5-INCH LOGO CAP.
AH1674
AH1674                          STATION RECOVERY (1997)
AH1674
AH1674'RECOVERY NOTE BY US POWER SQUADRON 1997
AH1674'RECOVERED IN GOOD CONDITION.
AH1674
AH1674                          STATION RECOVERY (2003)
AH1674
AH1674'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2003 (AJL)
AH1674'THE STATION IS LOCATED IN PORT ARANSAS ACROSS THE STREET AND SOUTH, OF
AH1674'THE MUSTANG
AH1674'BEACH AIRPORT
AH1674'OWNERSHIP--CITY OF PORT ARANSAS, PO BOX 1000, 710 WEST AVENUE A, PORT
AH1674'ARANSAS, TX
AH1674'78373-128.  TOMMY M BROOKS, CITY MANAGER.  PHONE--361-749-4111.
AH1674'TO REACH THE STATION FROM THE POST OFFICE IN PORT ARANSAS, GO 1.9 MILE
AH1674'SOUTH ALONG
AH1674'ALASTER STREET AND STATE HIGHWAY 361 TO PIPER BOULIVARD, TURN RIGHT,
AH1674'WEST, GO 0.3 MILE
AH1674'TO THE AIRPORT ENTRANCE, AND THE STATION ON THE LEFT.
AH1674'THE STATION IS, 15.3 M SOUTH OF THE CENTER OF A MANHOLE COVER, 12.5 M
AH1674'SOUTHWEST OF THE
AH1674'BOULIVARD CENTERLINE, 8.9 M SOUTHEAST OF THE CENTER OF A DRIVEWAY
AH1674'LEADING TO A PUMPING
AH1674'STATION, 6.6 M NORTHWEST OF UNDERGROUND CABLE JUNCTION BOX 5030-1, 0.6
AH1674'M ABOVE THE
AH1674'LEVEL OF THE BOULIVARD, AND 0.3 M NORTHEAST OF A WITNESS POST.
AH1674'NOTE--ACESS IS TO THE DATUM POINT IS THRU A 5-INCH LOGO COVER.  THIS
AH1674'IS A
AH1674'SECONDARY AIRPORT CONTROL STATION (SACS).
AH1674'
AH1674'
AH1674'
AH1674'
AH1674
AH1674                          STATION RECOVERY (2003)
AH1674
```

Wong, John E SWG

From: Donna_Shaver@nps.gov
Sent: Thursday, December 04, 2008 12:46 PM
To: Wong, John E SWG
Subject: RE: Port Aransas Biological Assessment

John:

One of my employees searched the database and found the following records since 1996. For the area of the biological assessment there have been 14 Kemp's ridley nests and one loggerhead nest documented.

1996 - 1 loggerhead
1997 - 1 Kemp's ridley
1998 - 2 Kemp's ridley
1999 - 2 Kemp's ridley
2001 - 1 Kemp's ridley
2004 - 1 Kemp's ridley
2005 - 1 Kemp's ridley
2007 - 3 Kemp's ridley
2008 - 3 Kemp's ridley

Please let me know if you need additional information.

Thanks,
Donna

****

Donna J. Shaver, Ph.D.

Chief, Division of Sea Turtle Science and Recovery Padre Island National Seashore National Park Service http://www.nps.gov/pais/

Address for mail:
Padre Island National Seashore
P.O. Box 181300
Corpus Christi, TX 78480-1300

Address for express mail services:
Padre Island National Seashore
Ranger Station
20301 Park Road 22
Corpus Christi, TX 78418

phone: (361) 949-8173 ext. 226
fax: (361) 949-1312
Pager: (361) 851-4255
E-mail: donna_shaver@nps.gov
****

"Wong, John E SWG" <John.E.Wong@usace.army.mil>
To: <Donna_Shaver@nps.gov>
cc:
Subject: RE: Port Aransas Biological Assessment

12/02/2008 02:03 PM CST

Donna,

Thanks for all the comments; certainly makes for a more complete document.

The coordinates (NAD83) are as follows:

North project boundary: 97 49'36"/97 03'17" or 27.8267 /97.0546

South project boundary: 97 44'55"/97 07'08" or 27.7485 /97.1188

I can get you UTM coordinates if needed.

John

-----Original Message-----
From: Donna_Shaver@nps.gov [mailto:Donna_Shaver@nps.gov]
Sent: Tuesday, December 02, 2008 12:34 PM
To: Wong, John E SWG
Subject: Re: Port Aransas Biological Assessment

John:

Thank you for your work on this. I reviewed the document, completing most of the information that you highlighted in yellow. I skimmed through the rest of it and added some additional comments in yellow that might help.
The only thing that I think is remaining is that table listing the number in the project area. I need to get some coordinates so that we can get the latest information from our database.

Thanks,
Donna

(See attached file: BA_excerpts_ for 2008 turtle info.doc)

****

Donna J. Shaver, Ph.D.

Chief, Division of Sea Turtle Science and Recovery Padre Island National Seashore National Park Service http://www.nps.gov/pais/

Address for mail:
Padre Island National Seashore
P.O. Box 181300
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Address for express mail services:

Padre Island National Seashore
Ranger Station
20301 Park Road 22
Corpus Christi, TX 78418

phone: (361) 949-8173 ext. 226
fax: (361) 949-1312
Pager: (361) 851-4255
E-mail: donna_shaver@nps.gov
****

BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES

DEPARTMENT OF THE ARMY PERMIT APPLICATION SWG-2007-01847
BY
CITY OF PORT ARANSAS

U.S. ARMY ENGINEER DISTRICT, GALVESTON
DECEMBER 5, 2008

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this Biological Assessment (BA) is to fulfill the U.S. Army Corps of Engineer's (USACE) requirements as outlined under Section 7(a) of the Endangered Species Act (ESA) of 1973 as amended. The proposed action requiring the assessment is Department of the Army (DA) permit application SWG-2007-1847 which would authorize beach maintenance activities along a 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits north to Lantana Drive in Port Aransas, Mustang Island, Nueces County, TX. The work is proposed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Table 1 is a list of federally listed species in Nueces County presented in this BA. For the purposes of this BA, the project area is defined as the area where the actual beach maintenance will take place, as depicted in the DA 24192 permit application drawings (Attachment 1). Wrong Permit # !

1.2 DESCRIPTION OF THE PROPOSED ACTION

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide
**only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

Schedule of Work:
Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance (Attachment 1, Sheet 2):

Entire 7 mile stretch to be patrolled [illegible] night [illegible] rpt.

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (7:00 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

Any additional work conducted on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

delete for flexibility

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C ~~during heavy sargassum season (April-August)~~. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from

below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake –** This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks –** Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake –** This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks –** Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities consistently result in ruts greater than two inches deep, the City has stated that retrofitting ~~of tires~~ will be considered. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI ~~in order~~ to reduce or eliminate rutting has not been implemented in Texas~~; therefore the~~ City maintains that they will not commit to anything more

Include in monitoring

than consideration of this practice at this time.

The City of Port Aransas typically has the following Public Works Staff assigned to beach maintenance:

- **4 Full-time Heavy Equipment Operators -** Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; primarily responsible for removal of sargassum and roadway maintenance.

- **2 Supervisors -** Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff. Also can be responsible for running all heavy equipment such as front-end loaders, tractors, and motor.

- **6 Full-time Ground Custodians –** Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.

- Between 15 March and 30 July of each year, a trained turtle monitor will be onsite in the immediate area where the beach is being maintained while activities are underway to be alert for any sign of turtles or turtle nests which may be impacted. Additionally, the monitor will advise the City as to the degree of any rutting that may be occurring as a result of the beach maintenance.

1.3 SUMMARY OF ALTERNATIVES CONSIDERED

City staff has conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives.

<u>Off-site Disposal</u>
As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law prohibits any sand from being removed from a barrier island.

<u>Non-mechanized Removal</u>
Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

<u>Mechanical Alternatives</u>
The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

No and Minimal Action Alternatives

The City has already initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

Alternative	Meets Objectives?	Physically Practical?	Financially Practical?	Legally acceptable?
No-action	**No**	**Yes**	**Yes**	**No**
Non-mechanized maintenance	**No**	**No**	**Yes**	**Yes**
Mechanized maintenance (off-site disposal)	**Yes**	**No**	**No**	**No**
Mechanized maintenance (on-site disposal)	**Yes**	**Yes**	**Yes**	**Yes**

2.0 IMPACT ASSESSMENT FOR LISTED SPECIES

To assess the potential impacts of the proposed project on endangered and threatened species, USACE Galveston District personnel and the applicant had meetings with the FWS, telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on these species. Significant literature sources relied upon in the preparation of this BA include the FWS series on endangered species of the seacoast of the U.S. (National Fish and Wildlife Laboratories (NFWL), 1980), Federal status reports and recovery plans, and performance reports of the Texas Parks and Wildlife Department (TPWD).

Of the 13 endangered species listed in Table 1 that are potentially present in the project area, possible impacts to the piping plover and five species of sea turtle have been identified to result from this project.

TABLE 1
ENDANGERED AND THREATENED SPECIES OF POTENTIAL OCCURRENCE IN THE DA PERMIT APPLICATION SWG-2007-1847 PERMIT AREA IN NUECES COUNTY, TEXAS[1]

Common Name	Scientific Name	Federal Listing Status
Gulf Coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered
Ocelot	*Leopardus pardalis*	Endangered
Brown pelican	*Pelecanus occidentalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened w/critical habitat in Texas
Slender Rush Pea	*Hoffmannseggia tenella*	Endangered
Kemps Ridley turtle	*Lepidochelys kempii*	Endangered
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered w/critical habitat designated (or proposed) outside Texas
Leatherback sea turtle	*Dermochelys coriacea*	Endangered w/critical habitat designated (or proposed) outside Texas
Green sea turtle	*Chelonia mydas*	Threatened w/critical habitat designated (or proposed) outside Texas
Loggerhead sea turtle	*Caretta caretta*	Threatened
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered
West Indian Manatee	*Trichechus manatus*	Endangered
Whooping Crane	*Grus americana*	Endangered

[1] According to U.S. Fish and Wildlife Service letter dated December 31, 2007 regarding DA application SWG-2007-1847.

2.1 GULF COAST JAGUARUNDI

2.1.1 Reasons for Status

The jaguarundi *(Herpallurus yagouaroundi cacomitli)* was listed by FWS as endangered on June 14, 1976 (41 FR 24064). Habitat loss and alteration due to brush-clearing activities, and human persecution are the main causes for the decline in jaguarundi populations (FWS, 1995a).

2.1.2 Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6% of the land area in south Texas is this type of habitat (Tewes and Everett, 1987). The thickets do not have to be continuous and may be interspersed with clear areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn, 1970; Davis and Schmidly, 1994). In South America, habitat includes high mountain forests, tropical forests, swamp forests, savannahs, overgrown pastures, and thickets (NFWL, 1980; Tewes and Schmidly, 1987).

The most common plants occurring in habitats in the Rio Grande Valley where the jaguarundi is known to occur are huisache, blackbrush acacia, prairie baccharis *(Baccharis texana),* chillipiquin *(Capsicum annuum),* lotebush, allthorn goatbush, Texas persimmon *(Diospyros texana),* coyotillo *(Kawinskia humboldtiana),* common lantana *(Lantana horrida),* berlandier wolfberry *(Lycium berlandieri),* javelina brush *(Microrhamnus ericoides),* Texas prickly pear *(Opuntia Iindheimen),* retama, honey mesquite, cedar elm *(Ulmus crassifolia),* and lime pricklyash *(Zanthoxylum fagara)* (Goodwyn,1970).

Jaguarundis have two distinct color phases, red and gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Felis eyra.* A third color phase, black, has also been reported, but apparently does not occur in Texas (Goodwyn, 1970).

Like the ocelot, the jaguarundi is primarily nocturnal, although some diurnal activity has been recorded. Jaguarundis are excellent climbers although they spend most of the time on the ground. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Jaguarundis communicate by calls, of which 13 have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley, 1976).

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets, hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Young have been born in March and August and possibly two litters occur per year. Usually 2 to 4 young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Gestation (for captive jaguarundi) varies from 63 to 75 days (Goodwyn, 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994).

2.1.3 Range

The jaguarundi historically occurred in southeast Arizona, south Texas, and Central and South America as far south as northern Argentina. Today this cat has a similar distribution, but in much reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly, 1987). The presence of jaguarundis in Florida is likely the result of human introduction (Nowak and Paradiso, 1983).

Four North American subspecies are recognized, of which two occur in the U.S.: *H.y. cacomitli* from southern Texas to central Vera Cruz, Mexico, and *H.y. tolteca* from southern Arizona, along the Pacific coast of Mexico, and inland to the Mexican Plateau (Goodwyn, 1970; NFWL, 1980).

2.1.4 Distribution in Texas

Tewes and Everett (1987) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundis (and ocelots) in Texas. Many of the reports were solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf coast as well as from south Texas. Two dead jaguarundis were reported in Cameron County and one each in Willacy and Webb counties. Tewes (1987) and Tewes and Everett (1987) documented several other credible reports of jaguarundis in these three counties. One of these was of a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Kellers Corner) in Cameron County on April 21, 1986 (Tewes, 1987; Laack and Rappole, 1 987b). Although this was the last confirmed record of a jaguarondi in Texas (Laack, 1998), unconfirmed jaguarundi sightings in Hidalgo County include Bentsen Rio Grande State Park, Santa Ana NWR, Lower Rio Grande Valley NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the TPWD Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Unconfirmed but reliable sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous, 1989). Recent jaguarundi sightings have been reported from the Santa Ana NWR for March 1998 (Santa Ana NWR data). Based on sighting reports, personnel of the Santa Ana NWR suspect the presence of jaguarundis on the refuge (Benn, 1997).

Tewes and Everett (1987) concluded that until verifiable evidence of jaguarundis from central Texas and the upper Gulf coast was forthcoming, jaguarundi distribution in Texas should be considered as restricted to the Rio Grande Valley. The number of jaguarundis in Texas is unknown, but certainly less than that of ocelots.

2.1.5 Presence in the Project Area

Jaguarundis are not known to occur within the project area due to lack of suitable habitat. The last documented siting of the species occurred more than 130 miles south of the project area on the mainland where suitable thorn-scrub habitat is available.

2.1.6 Effects of the Project

This project is expected to have no effect on the jaguarundi, as it is unlikely to occur on the beach area near project activities due to the lack of suitable brushy habitat.

2.1.7 Conservation Measures

Because no potential effects to the jaguarundi will occur as a result of the proposed project, no additional conservation measures are needed.

2.1.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the jaguarundi.

2.2 OCELOT

2.2.1 Reasons for Status

The ocelot *(Leopardus pardalis)* is listed as endangered throughout its present range (FWS, 1995a, 2000b). Habitat destruction and degradation due to brush-clearing has been the major cause for its population decline, but predator control activities and hunting have also contributed. In Central and South America, exploitation for the fur and pet trade is primarily responsible for population declines (NFWL, 1980; FWS, 1995a).

2.2.2 Habitat

The ocelot occupies a variety of habitats throughout its neotropical range including tropical and subtropical forests, riverine forests, swampy savannahs, estuarine mangroves, rocky areas, and upland oak forests (NFWL, 1980; Tewes and Schmidly, 1987; Murray and Gardner, 1997). In Texas, however, ocelots inhabit dense, often thorny and impenetrable brush, mesquite-oak and oak forests, and partially cleared land (NFWL, 1980; Navarro, 1985). Tewes (1986) found honey mesquite, acacias, condalia *(Condalia* spp.), allthorn goatbush *(Castella toxana),* granjeno, cenizo, and whitebrush *(Aloysia texana)* to be the dominant brush species of ocelot habitat in south Texas. Approximately 1.6% of the land area in south Texas now supports this type of habitat (Tewes and Everett, 1987).

Tewes and Everett (1987) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A or optimal habitat was 95% canopy cover, Class B or suboptimal habitat was 75% to 95% canopy cover, and Class C, with 75% or less canopy cover, was considered inadequate. The most critical component of habitat is probably dense cover near the ground (<3 feet in height) (Tewes, 1986).

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro, 1985; Tewes, 1986; Tewes and Schmidly, 1987). Navarro (1985) found ocelots in Texas to have two peaks of activity, one at about midnight and the other at daybreak. Ocelots feed on small and medium-sized mammals such as woodrats *(Nootoma* spp.), rabbits *(Sylvilagus* spp.), young deer *(Odocoious* spp.), nutria *(Myocastor coypus),* birds, reptiles, amphibians, fish, insects and, in Latin America, spider monkeys *(Ate/es* sp.), coatis *(Nasua nasua),* and agoutis *(Agouti* sp.) (Hall and Dalquest, 1963; Guggisberg, 1975; Navarro, 1985; Tewes and Schmidly, 1987; Emmons, 1988).

Although breeding occurs throughout the year in the tropics, it occurs primarily in the fall (September through November) in Texas; however, births have also been recorded in April, June, July and August. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Petrides et al., 1951; Navarro, 1985; Tewes, 1986; Laack and Rappole, 1986, 1987a; Tewes and Schmidly, 1987). Gestation is 70 to 80 days. Litter size ranges from two to four, with two being the most common. The mother provides extended parental care to the young because it takes time for them to become proficient at capturing prey. Males are believed to contribute little towards direct parental care (Tewes, 1986). Ocelots in the wild become sexually mature at 16 to 18 months (Schauenberg, 1979), but in captivity, maturity may be reached in as little as 10 to 12 months.

Navarro (1985) found that the average home range (the area that an animal occupies during its normal daily activities) for three male ocelots in south Texas was 618 acres, and for one female was 519 acres. Similarly, Twedt and Rappole (1986) reported home ranges of 865 and 296 acres for two male ocelots on Yturria Ranch in Willacy and Kenedy counties. However, Tewes (1986), using a much larger database, found the average home range of south Texas ocelots to be 4,372 acres for males and 2,717 acres for females. The overall average for adults was 3,754 acres. Although male ocelots had larger territories than the females and generally covered an extensive area in a short period, females used the home range more intensively (Tewes, 1986; FWS, 1990b). Tewes (1986) also determined that home ranges expanded in the winter and contracted in the summer. Both Navarro (1985) and Tewes (1986) found little overlap in the home ranges of adjacent males, but quite a considerable intersexual spatial overlap in the home ranges. Tewes and Schmidly (1987) and Navarro (1985) also found that the home ranges were closely aligned with the amount of suitable available habitat. At Laguna Atascosa NWR, for example, an increase in the ocelot population has resulted in smaller home ranges, two ocelots occupying an area that had previously supported only one (Tewes, 1988). Some individuals there currently inhabit areas as small as 80 acres (Tewes, 1988).

2.2.3 Range

Historically, the ocelot occurred in Arkansas, Arizona, southern California, and south through Central and South America to Peru, Uruguay, and northern Argentina (Navarro, 1985). Today it ranges from Arizona and Texas through Central and South America to northern Argentina, but in reduced numbers (Tewes and Everett, 1987; Emmons, 1990; Murray and Gardner, 1997).

2.2.4 Distribution in Texas

The ocelot once occurred in the eastern, central and southern portions of Texas, but currently only exists in the extreme south of the State (Davis and Schmidly, 1994). As a first step to determining the status of the ocelot in Texas, a clearinghouse for ocelot (and jaguarundi) sightings was established in October 1981 to coordinate reception and filing of reports. A total of 1,572 questionnaires was mailed to trappers to obtain additional information; of these, 472 (30%) were returned and 87 (6%) contained positive responses (Tewes and Everett, 1987). From these results, it appears that two significant populations of ocelots exist in south Texas. One population inhabits parts of Hidalgo, Starr, Cameron, and Willacy counties, and the other, Jim Wells, Live Oak, McMullen and Atascosa counties. Six or seven smaller populations may also occur. Based on studies of spatial patterns and densities of radio-collared ocelots, Tewes (1986) estimated that only 80 to 120 ocelots occur in Texas. Laack (1998) currently puts this number at 100. A population of approximately 30 to 40 ocelots occurs on the Laguna Atascosa NWR in Cameron County (Laack, 1998). One or two ocelots apparently occur at the Santa Ana NWR (Benn, 1997; Laack, 1998), and one pair of ocelots had territories near the Arroyo Colorado in Cameron County (Laack, 1998). Ocelots have been sighted at the NAS's Sabal Palm Grove Sanctuary (Homerstad, 1986); and at the Loma de Grulla complex north of Laguna Vista, at Moranco Blanco, and at Redhead Ridge (Tewes, 1987). Ocelot sightings have also been reported from the Lower Rio Grande Valley NWR. In addition, Laack and Rappole (1986, 1987a), Tewes (1987) and Homerstad (1987) have documented several other ocelot sightings in Cameron County. The closest ocelot population in Mexico is near San Fernando, approximately 100 miles south of the U.S.-Mexico border (Laack, 1998).

2.2.5 Presence in the Project Area

Ocelots are not known to occur within the project area due to lack of suitable habitat. Species populations are known to occur more than 130 miles south, and more than 50 miles west of the project area on the mainland where dense, brushy habitat is present.

2.2.6 Effects of the Project

This project is not expected to affect the ocelot, since it is unlikely to occur in the vicinity of project activities due to the lack of suitable brushy habitat in these areas.

2.2.7 Conservation Measures

Because no potential effects to the ocelot will occur as a result of the proposed project, no additional conservation measures are needed.

2.2.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the ocelot.

2.3 BROWN PELICAN

2.3.1 Reasons for Status

The brown pelican *(Pelecanus occidentalis)* was listed as endangered throughout its foreign range on June 2, 1970 (35 FR 8495) and throughout its U.S. range on October 13, 1970 (35 FR 16047). Population declines were attributed largely to chlorinated hydrocarbon residues from the use of pesticides, such as DDT compounds (DDE, DDD, and DDT), polychlorinated biphenyls (PCBs), dieldrin, and endrin, which caused eggshell thinning; thus, eggs became desiccated and were more easily broken during incubation (NFWL, 1980). Other factors included human disturbance and loss of habitat due to commercial and residential development (FWS, 1995a). Pelicans are large, heavy birds and easily flushed from the nest. Flushing exposes the eggs and young to predation, temperature stress and permanent abandonment by the parents.

A ban on the use of DDT in the U.S. in 1972, together with efforts to conserve and improve remaining populations, has led to increased numbers of brown pelicans. Populations in some areas have increased to historical breeding levels or above, with stable population numbers and productivity. The brown pelican has been delisted along the U.S. Atlantic coast and, in Florida and Alabama, along the Gulf coast. It remains endangered throughout the rest of its range, which includes Mississippi, Louisiana, Texas, California, Mexico, Central and South America, and the West Indies. In May 1998, the FWS announced its intention to either delist or downlist to threatened status numerous species, including the brown pelican (63 FR 25502—25512; May 8, 1998).

2.3.2 Habitat

Brown pelicans inhabit shallow coastal waters with water depths up to 80 feet (Palmer, 1962; NFWL, 1980; Fritts et al., 1983). They are rarely found inland and do not venture more than 20 miles out to sea except to take advantage of particularly good feeding situations (FWS, 1980). Distances of 61 miles from shore have been recorded (Fritts et al., 1983). Brown pelicans, which are colonial nesters, usually nest on undisturbed offshore islands in small bushes and trees, including mangroves, and in humid forests (NFWL, 1980; Guzman and Schreiber, 1987). Occasionally they nest on the ground and preferred sites are those free from human disturbance, flooding, and terrestrial predators, such as raccoons and coyotes. Brown pelicans utilize beaches, sandbars, sand spits, mud flats and even manmade structures such as piers, wharves, pilings, oil/gas platforms, and docks for loafing (NFWL, 1980). No critical habitat has been designated for this species.

2.3.3 Range

The brown pelican occurs along the Pacific coast of the Americas from southern British Columbia south to Cape Horn and throughout the Atlantic, Gulf and Caribbean coastal areas from New Jersey south to eastern Venezuela. In North America, it occasionally ventures inland north to North Dakota, Ontario and Nova Scotia. Its breeding range is more restricted: along the Pacific coast from central California south to Chile, including the Galapagos Islands; and from North Carolina, south to eastern Venezuela, the West Indies, Greater Antilles, and Virgin Islands (American Ornithologists' Union (AOU), 1998).

In North America, two subspecies are recognized: the eastern brown pelican (*P.o. carolinensis*) ranging from North Carolina south through Florida and west to Texas, and the California brown pelican (*P.o. californicus*) in California (NFWL, 1980). For the eastern subspecies, the present range is the same as the historical one, but in reduced numbers. It became extirpated in Louisiana in 1966, but has since (beginning in 1968) been reintroduced from Florida. It has never been known to nest in Mississippi or Georgia (FWS, 1980; 50 FR 4938, February 9, 1985). Brown pelican colonies are known to occur on the east coast of Mexico off the eastern tip of the Yucatan Peninsula (Mabie, 1986, 1988).

While some migration occurs after nesting in both subspecies, many individuals overwinter close to their breeding grounds (FWS, 1980). Atlantic coast populations move southward in the fall, with most birds wintering in the U.S., particularly in Florida. Some birds, however, disperse to the Cuban coast (Clapp et al., 1982). Gulf coast birds tend to remain on the Gulf coast, although Texas and Louisiana birds have been recovered in Mexico and Cuba (Palmer, 1962; Clapp et al., 1982).

2.3.4 Distribution in Texas

Historically, the brown pelican was a common bird of the Texas Gulf coast with an estimated breeding population of 5,000 pairs residing in 17 colonies in 1918 (Mabie, 1990). By the 1960s, however, it was almost extirpated. In 1963, only 14 breeding pairs were recorded along the Texas coast and in 1964 no known nesting occurred (Mabie, 1986). The decline started during the 1920s and 1930s due to human disturbance (Oberholser, 1974), but continued due to pesticide contamination (King et al., 1977; Mabie, 1986). Since the 1960s, the brown pelican has made a gradual comeback in Texas with an estimated 2,400 breeding pairs in 1995 (Campbell, 1995). Most of the breeding birds have traditionally been found on Pelican Island in Corpus Christi Bay, Nueces County, and Sundown Island near Port O'Connor in Matagorda County. Smaller groups or colonies occasionally nest on Bird Island in Matagorda Bay, a series of older dredged material islands in West Matagorda Bay, Dressing Point Island in East Matagorda Bay, and islands in Aransas Bay (Campbell, 1995). No current nesting sites are known from the lower

Texas Coast. Although brown pelican colonies are not monitored every year, 1,900 and 750 pairs nested on Pelican Island in 2003 and 2004 respectively, and on Sundown Island, 1,714 pairs nested in 2005 and 987 pairs nested in 2004 (FWS, 2005a). Recent predation on Pelican Island resulted in no observed 2005 breeding pairs, which has possibly led displaced breeding pairs to use Shamrock Island with 340 pairs, and Sunfish Island with 30 pairs, both islands which are located in Corpus Christi Bay. Further to the south, 100 breeding pairs were observed on a Laguna Vista island in 2004 (FWS, 2005a).

2.3.5 Presence in the Project Area

In Texas, the brown pelican occurs from Chambers County to Cameron County (Campbell, 1995), primarily along the lower and middle coasts. Occasional sightings are reported on the upper coast and inland to central, north-central, and eastern Texas (Texas Ornithological Society (TOS), 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. The Padre Island National Seashore (PAIS) checklist of birds lists the brown pelican as an uncommon from March through November and rare in winter and is more common on the Gulf side of Padre Island than in the Laguna Madre (Southwest Parks and Monuments Association (SPMA), 1990). Brown pelicans are likely to occur in the project area and immediate vicinity as post-breeding visitors or migrants.

2.3.6 Effects of the Project

This species is expected to forage in the project area or general vicinity on occasion, and it could potentially be temporarily affected from noise and activity from the proposed project. Because the nearest active nesting colony is at Shamrock Island, approximately 7.0 miles southwest of the proposed project at it closest point, nesting pelicans will not be impacted by the project. Direct impacts to loafing and feeding birds may result from beach maintenance vehicles and activities. Beach maintenance activities may disturb brown pelicans causing them to take flight and relocate to other feeding and loafing areas. This displacement will be temporary since birds disturbed by traffic or human activities generally move a short distance away and continue to perform their pre-disturbance behavior. No significant impacts to this species are anticipated as a result of this project.

2.3.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the status and habitats of this species. Because only temporary potential effects to the brown pelican may occur as a result of the proposed project, no additional conservation measures are identified.

2.3.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the brown pelican.

2.4 PIPING PLOVER

2.4.1 Reasons for Status

The piping plover *(Charadrius melodus)* was Federally listed as endangered on December 11, 1985, for the Great Lakes watershed and was listed as threatened throughout the remainder of its range (50 FR 50726). The rule became effective on January 10, 1986. In 1986, an estimated 2,100 to 2,300 breeding pairs occurred in North America: 1,337 to 1,409 pairs in the northern Great Plains, 19 to 24 pairs in the Great Lakes, and 799 pairs along the Atlantic coast (Haig et al., 1987). Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat due to commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and the draining of wetlands have further contributed to the decline of the species (FWS, 1995a). Additional threats include human disturbances through recreational use of habitat and predation of eggs by feral pets (FWS, 1995a).

2.4.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include: sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on emergent dredged material placement areas as well as natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. On the wintering grounds, these birds utilize beaches, mud flats, sand flats, dunes, and offshore spoil islands (AOU, 1998; FWS, 1995a). Much of the Laguna Madre in Mexico became less suitable as important wintering areas for this species when its water level was stabilized for a fisheries lagoon. In Texas, an estimated 30% of wintering habitat had been lost over a 20-year period (50 FR 50726; December 11, 1985). Critical habitat has been designated for this species in the project area as described below.

get citation

2.4.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario), and along the Atlantic coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf of Mexico coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 FR 50726, December 11, 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic coast (AOU, 1998). Little is known about the migration routes of this species.

2.4.4 Distribution in Texas

The piping plover begins arriving at its post-breeding and wintering grounds in Texas in mid to late July. Haig and Oring (1985, 1987) found that early in the post-breeding season, piping plovers frequented beaches, but later tended to inhabit ephemeral sand flats along the backside of barrier islands. Observations of wintering piping plovers in Alabama did not indicate a seasonal preference between habitats, although wintering plovers spent more than 85% of their time on sand flats or mud flats each month (Johnson and Baldassarre, 1988). Along the Texas coast, a correlation appears to exist between tidal height and habitat selection, with piping plovers actively feeding on tidal flats during periods of low tides, and on the Gulf beaches during high tides (Eubanks, 1991; Zonick, et al., 1998; Drake et al., 2000). Winter distribution studies along the Atlantic and Gulf coasts found piping plovers usually occurring in small, unevenly distributed groups along the coast; however, the sites with largest concentrations of plovers consisted of expansive sand flats or mud flats with sandy beach in close proximity (Nicholls and Baldassarre, 1990). Plovers on the wintering grounds suggest that they show some site fidelity, returning to the same stretch of beach year after year. On the lower Texas coast, individual plovers are known to use areas about 3,000 acres in size, moving 2 miles or more between foraging sites as tidal movements shift the availability of productive tidal flats (TPWD). Recent studies show significantly more stringent site fidelity with individual birds returning to more precise locations (+/-400 feet in lateral distance on the beach) each year (Amos, 2006). Piping plover concentrations in Texas occur in Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio and Willacy counties (FWS, 1988). FWS (1995a) estimates that approximately 1,900 piping plovers, or approximately 35%, wintered along the Texas Gulf coast.

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consist of coastal beach, sand flat and mud flat habitats.

Remove

Critical Habitat for the wintering grounds (as opposed to breeding population Critical Habitat) has recently been designated in Texas by the FWS (66 FR 36074—36078), some of which lies partially or entirely within the project area:

- ~~TX-3 (subunit 4) – This subunit extends along the gulf shore of Padre Island from the northern boundary of Padre Island National Seashore at the shore, north to the Nueces-Kleberg county line.~~
- TX-8- Mustang Island Beach – This is a stretch of beach extending from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas, TX. The landward boundary is the beginning of dense vegetation, and the gulfward boundary is MLLW.

Other Critical Habitat areas are located either adjacent to or very near, but not within the project area. These areas will not be disturbed by beach maintenance activities. These include:

- TX-5 – Upper Laguna Madre – This unit includes a series of small flats along the bayside of Padre Island in the Upper Laguna Madre. The landward boundary is the beginning of dense vegetation and the waterward boundary is the MLLW in the Laguna Madre. It is bounded in the north by the Nueces/Kleberg County line and in the south by the northern boundary of Padre Island National Seashore (PAIS).
- TX-6 – Mollie Beattie Coastal Habitat – Subunit 1 is bounded in the north by Beach Access Road 3, on the east by the inland boundary of critical habitat Unit TX-7, on the south by Zahn Road, and on the west by Zahn Road. Subunit 2 is bounded on the north by Corpus Christi Pass, on the east by SH 361, on the south by the north side of Packery Channel, and on the west by the Gulf Intracoastal Waterway.
- TX-7 – Newport Pass/Corpus Christi Pass Beach – This unit is along a stretch of Gulf beach 5.3 miles long. It is bounded on the north by Fish Pass, on the east by MLLW, on the south by St. Bartholomew Avenue, and on the west by a line marking the beginning of dense vegetation.
- TX-9 – Fish Pass Lagoons – This unit encompasses flats facing Corpus Christi Bay that extend 0.6 mile on either side of Fish Pass. The inland boundary is the line indicating beginnings of dense vegetation, and the bayside boundary is MLLW.
- TX-10 – Shamrock Island and Adjacent Mustang Island Flats – This unit encompasses Shamrock Island, an unnamed small sand flat to the north of Wilson's Cut, and a lagoon complex that extends 2.2 miles to the southwest of Wilson's Cut. Critical habitat includes land to the line marking the beginning of dense vegetation down to MLLW.

On 26 July 2006, the United States District Court, Victoria County, Texas handed down a ruling in regards to a court case between the GLO and USFWS, which vacated the critical habitat rule adopted by the Service on July 10, 2001, (66 FR 36038) for 19 of the 37 Texas Critical Habitat units designated for the Wintering Piping Plover. This ruling remanded the service to conduct new rulemaking in accordance with all applicable federal laws. All of the above referenced areas, with the exception of TX-5 and TX-6 (located outside the immediate project area), were included in this ruling. As of the writing of this biological assessment, the USFWS is still re-evaluating these areas and reclassification of those units affected by this ruling has not been completed.

2.4.5 Presence in the Project Area

The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser 1974; Haig and Oring, 1985, 1987; Haig and Plissner, 1993; TOS, 1995) and wintering birds have been reported along the length of the Texas coast. The PAIS checklist of birds lists the piping plover as a common winter resident but as an uncommon summer inhabitant of Gulf and bay environs within the seashore (SPMA, 1990).

During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW, 1996). The proposed project area was included in that survey.

Remove Comment

Piping plover may occur throughout the project area, ~~though with~~ varying numbers and concentrations depending on annual fluctuations of the regional climate and time of year. Portions of two former critical habitat areas, TX-3 (subunit 4) and TX-8, are located on Gulf of Mexico beaches within the project area and ~~both contain a similar~~ wide, sandy beach habitat type.

2.4.6 Effects of the Project

The effects of the proposed beach maintenance activities on the piping plover are expected to be minimal. In studies along the Laguna Madre, Drake et al. (2000) found that overall usage of relatively undisturbed beach habitats by wintering piping plovers, including both foraging and roosting activities, was minimal (2.8%). Piping plovers were found primarily to use beach habitats when other preferred habitats were unavailable, such as when algal and sand flats were inundated. This is considered to be partly due to the prime availability of forage species on tidal flats but also possibly due to the high level of disturbance on beach habitats (Drake et al., 2000). The entire beach area included in the permit application currently receives considerable use by recreational beach visitors. This high use does result in disturbance to piping plovers. Mechanized cleaning of the beaches will also result in some additional disturbance to individual birds using the beach; however, unlike the beach use by the public, beach maintenance activities tend to occur in only small segments of the beach at any one time and thus are likely to pose only a minor and temporary disturbance to resting and foraging birds when compared to general recreational use of the beach in general. Further, periodic cleaning of the beaches will result in the removal of large quantities of debris and sargassum, which, if not removed, result in the coverage of large expanses of the open beach. Removal of these items will actually expose more of the beach for use by foraging piping plovers.

Primary

Not Preferred

The effects of beach maintenance activities on piping plover habitat with respect to erosional impacts on habitat area are expected to be minimal. Erosion rates are increasing along most of the Texas coast; the proposed beach maintenance activities are not expected to have an appreciable influence on local erosion rates.

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island (a beach which is described as having a history of beach maintenance activity) than on St. Joseph Island, a beach that is not cleaned. In addition, this same study suggests a general increase of total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels than in years where the sargassum levels are considerably higher. These observations tend to show a positive effect on the piping plover where the beaches are more open with less occurrence of sargassum accumulation.

Repeat

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island, which has a history of beach maintenance activity, than on St. Joseph Island, a beach that is not cleared. In addition, the same study suggests a general increase in total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels.

In summary, the proposed project is unlikely to result in any appreciable change in available critical habitat for the piping plover. Sargassum clearing activities may remove structure that plovers use for protection from the elements, but beach clearing is at a minimum during winter months when the birds are most likely to need protection from the elements. Further, sargassum removal may actually free up open beach foraging areas on a temporary basis. There will be no impact to plover nesting, as it does not occur in Texas. Wintering plovers that currently use the project area are already subjected to regular, and in some cases more prolonged, displacement by the public's recreational use of the beaches. Direct impacts to piping plovers from beach maintenance activities are most likely to occur during the spring and summer months when increased use of the beaches by the public necessitates intensified maintenance activities. Maintenance activities are at a minimum during winter months when plovers are more likely to be found in the proposed project areas. Most beach clearing activities are performed above the "wet beach" area and are thus above the portion of the beach most frequently used for foraging by plovers. Beach maintenance activities may temporarily displace plovers causing them to take flight, but displaced birds can easily relocate to adjacent habitat, as beach maintenance operations will be limited to only a fraction of the total project area at any given time. In fact, HDR/Shiner Moseley biologists have observed displaced birds relocating to other habitats, many of which are a short distance (less than 150 feet) from the area of disturbance. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements. In addition, periodic removal of considerable amounts of debris and sargassum will actually uncover more of the beach and thus allow for more of the beach to be used as foraging area.

2.4.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species. To accomplish this, the City will arrange a yearly training course with either PAIS or the University of Texas Marine Science Institute (UTMSI). The scope of the training will include: 1) Identification of piping plovers; 2) Recognition of plover habitat; 3) Basic procedures for recording piping plover information; 4) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with piping plover training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken in order to allow the City to conduct beach maintenance activities as authorized by the USACE permit, to monitor the effects of beach maintenance activities on piping plovers and their habitat, and to make determinations about potential adjustments to beach maintenance activities in an adaptive fashion on an as-needed basis (See Attachment 2). Parameters to be assessed are beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities. Results of the habitat monitoring effort will be provided in an annual report to USACE by February 1 of each year for a period of 5 years.

2.4.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the piping plover.

2.5 SLENDER RUSH PEA

2.5.1 Reasons for Status

The slender rush pea *(Hoffmannseggia tenella)* was first proposed as an endangered species on November 21, 1984 and became listed as endangered on November 1, 1985 (50 FR 45614, 45618). The reasons for decline (comments published in the Federal Register, 50 FR 45614, February 25, 1986) identified the loss due to conversion of Gulf Coastal Prairies to agriculture and competition from nonnative grasses (primarily King Ranch bluestem and Bermuda grass) that have been introduced for soil stabilization and pasture improvement. Limited distribution and low population numbers make this species vulnerable to any further disturbance.

2.5.2 Habitat

Slender rush pea grows on calcareous, clayey soils in prairies and creek bands associated with short and midgrasses such as buffalograss, Texas wintergrass (Stipa leucotricha), and Texas grama. Woody plants such as honey mesquite, huisache, huisachillo (Acacia tortuosa), granjeno, brasil (Condalia hookeri), retama, lotebush (Zizyphus obtusifolia), tasajillo (Opuntia leptocaulis), and prickly pear (Opuntia spp.) are also common at the known sites. No critical habitat has been designated for this species.

2.5.3 Range

The slender rush pea, known only to Texas, can be found along the South Texas Gulf coast counties of Kleberg and Nueces (TPWD, 1999c).

2.5.4 Distribution in Texas

The slender rush pea is known from only three or four populations in Kleberg and Nueces counties (TPDW, 1999c).

2.5.5 Presence in the Project Area

This species is unlikely to occur in the project area due to the lack of suitable soils and habitat.

2.5.6 Effects of the Project

No effects to the slender rush pea are anticipated as a result of this project.

2.5.7 Conservation Measures

Because no potential effects to the slender rush pea will occur as a result of the proposed project, no additional conservation measures are needed.

2.5.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the slender rush pea.

2.6 KEMP'S RIDLEY SEA TURTLE

2.6.1 Reasons for Status

Kemp's ridley *(Lepidochelys kempii)* was listed as endangered throughout its range on December 2, 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (FWS and NMFS, 1992; NMFS, 2000). The National Research Council's (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86% of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). It is estimated that before the implementation of Turtle Exclusion Devices (TEDs) the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NMFS, 2000). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and long lines.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54% (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, Styrofoam, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf of Mexico. Laws enacted during the late-1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products poses additional threats (Campbell, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). Dredging operations affect Kemp's ridley sea turtles through incidental take and by degrading the habitat. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through open bay placement of dredged material, degraded water quality/clarity, and altered current flow (FWS and NMFS, 1992).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results. Adult females also may avoid brightly lit areas that would otherwise provide suitable nesting sites (FWS, 1998). Also of concern are impacts to nesting sites due to vibration, sand compaction, sargassum piles, vehicular ruts and collisions with motor vehicles.

Today, under strict protection, the population appears to be in the early stages of recovery. Approximately 6,000 Kemp's ridley nests were recorded on Mexican beaches during the 2000 nesting season (Shaver, 2000). In 2001, 5,369 Kemp's ridley nests were recorded in Mexico, while in 2002 the number of nests rose to 6,326. As of mid-August 2003, 8,100 nests have been recorded in Mexico (Peña, 2003). More recent counts include approximately 10,000 nests in 2005, 12,000 in 2006, and 15,000 nests in 2007 (Shaver, personal correspondence, 2007). In addition, nesting on Texas beaches also continues to increase with the 2008 count, totaling 195 confirmed nests (Shaver, 2008b). The increase likely can be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use TEDs in shrimp trawlers both in the U.S. and in Mexico (NMFS, 2000).

2.6.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, although rarely in bays, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on sargassum and associated infauna, and other epipelagic species of the Gulf of Mexico (FWS and NMFS, 1992). In some regions the blue crab *(Callinectes sapidus)* is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Shaver, 1991; Campbell, 1995).

2.6.3 Range

Adults are primarily restricted to the Gulf of Mexico, although juveniles may range throughout the Atlantic Ocean since they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

The majority of Kemp's ridleys nest on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, approximately 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz. Nesting has been documented from approximately 134 miles of the Tamaulipas coastline, and sporadic nesting has been reported from Bolivar Peninsula, Texas, southward to Isla Aquada, Campeche. There have been several isolated nesting attempts scattered from North Carolina to Colombia.

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched Rancho Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas (mainly) or Florida waters (Caillouet et al., 1993). This program has shown some results. The first nesting from one of these head started individuals occurred at Padre Island in 1996 and more nestings have occurred since (Shaver, 2000). A continuing program is still ongoing. Eggs from sea turtle nests found at Padre Island National Seashore and northward along the Texas coast are transported to the National Seashore's sea turtle incubation facility for protected care and monitoring. The hatchlings from the eggs are released at the northern end of Padre Island National Seashore when they emerge from their eggshells and become active (NPS, 2007).

2.6.4 Distribution in Texas

Kemp's ridley turtles occur in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. Additionally, there appear to be a population of Kemp's ridley turtles which remain in the northern gulf for longer periods of time. Females nesting on the Texas coast are remaining resident here offshore during the nesting season and to some extent later, according to turtles recently outfitted with radio receivers; one prior to 2006 and one in 2007 (Orms, 2008). Additionally, one of the males previously tracked in Mexican waters traveled to waters off the Texas coast. Studies also show that juvenile turtles use Texas areas extensively for foraging.

Kemp's ridley turtles have nested sporadically in Texas in the last 50 years and total number of nests has increased over the last decade. Nests were found near Yarborough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. From 1979 to 2008, 722 sea turtle nests were found on the Texas coast. Of the 722 nests, 649 were Kemp's ridley nests, 361 of which were found on PAIS (Shaver, 2008). In 1999, 16 confirmed Kemp's ridley nests were recorded in Texas, 12 nests were confirmed for 2000, 8 for 2001, 38 for 2002, 19 for 2003, 42 for 2004, 51 for 2005, and 102 for 2006 (PAIS data). For the 2008 nesting season, there have been a total of 195 confirmed nests. Several of the ridley nests were from head-started individuals. Such nestings, together with the proximity of the Rancho Nuevo breeding ground, probably accounts for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1986, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection. Kemp's ridleys have been observed mating in the Mansfield Channel and, thus, could potentially mate in the nearby Laguna Madre and Gulf of Mexico.

2.6.5 Presence in the Project Area

In south Texas, Kemp's ridley turtles have been recorded in Willacy County, as well as in Nueces, Kleberg, Kenedy and Cameron counties (Dixon, 2000). Thus, this species could potential occur in the project area. During the 2006 nesting season, a total of 102 Kemp's ridley nests were documented along the Texas coast (NPS 2006), 128 during the 2007 nesting season (NPS, 2007), and 195 during the 2008 nesting season (Shaver, 2008). Kemp's ridley turtles are the only species to have nested in the proposed project area over the last five years; nest totals for the proposed project area are as follows (Shaver, 2008):

Year	# Kemp's Ridley Nests
1997	1
1998	1
1999	2
2000	0
2001	1
2002	0
2003	0
2004	1
2005	1
2006	0
2007	3
2008	3

2.6.6 Effects of the Project

The following discussion will be referenced for all sea turtles included in this BA. Section 7 consultation with NMFS concluded in their concurrence that endangered and threatened turtles in the aquatic environment will not be affected by this project. Activities will generally be carried out above the MHT, rather than in the water, and will therefore not significantly affect any aquatic environment.

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be directly vulnerable to the heavy machinery associated with beach maintenance activities. In addition, those activities could interfere with and/or prevent some turtles from attempting to nest. Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann, 1977; NMFS and U.S. Fish and Wildlife Service, 1991a, 1991b, 1992, 1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it difficult to find possible nests for protection. Ruts from vehicles can trap hatchlings and smaller stranded turtles and may result in death (Hosier et al., 1981; Fletemeyer, 1996, Ernest et al., 1998). Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer, 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Data is not available on the degree that compaction, resulting from vehicle use on the beach, either prevents or reduces nesting success.

Vibrations and noise caused by moving vehicles on the beach during beach maintenance operations could frighten nesting turtles, causing them to abandon their nesting attempt (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Vibrations could also harm incubating eggs. It is difficult to assess this possible impact since scientific data is lacking for the Kemp's ridley turtles' sensitivity to traffic vibrations or noise. Vibrations could affect sea turtles either during nest site selection after exiting the water or once the eggs are laid. Vibrations could cause sea turtles to abandon a nesting attempt resulting in a false crawl and causing a sea turtle to re-enter the water and nest in another location. Information suggests that turtles do not respond to vibrations once egg-laying has begun.

Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Regular beach maintenance removes debris, including non-natural items (e.g. plastics, beach chairs, old buoys) and large natural objects (e.g. tree trunks and sargassum), both of which wash ashore in large quantities and both of which can impede or prevent turtle nesting. At times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to four feet in height and 10 to 20 feet in width. The removal of this material, as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier and by providing a smooth crawlway.

Beach maintenance has the potential to kill emerging hatchling turtles from in situ nests not previously discovered by patrols. The hatchlings may be caught in seaweed which will be scraped up and either mounded or buried. While this is a potential effect of the project, it is not possible to quantify the potential impacts that may result from beach maintenance programs. USFWS states that turtle mortalities may also result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.6.7 Conservation Measures

This project may potentially impact Kemp's ridley turtles if they are present in the project area during beach maintenance activities. However, conservation measures and monitoring of beach maintenance activities by trained City employees and volunteers affiliated with the University of Texas Marine Science Institute (UTMSI) will help decrease the likelihood of impacts.

The USACE intends to condition any permit issued to the City for this work to include provisions that require the City to do the following:

(1) Annual Sea Turtle Monitoring Plan

Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the Corps of engineers for approval. This plan shall contain information on how the City will ensure compliance with the conservation measures for sea turtles as defined in this section. In addition, an annual follow-up report will be presented to the Corps prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

The City will provide a financial award to any City beach maintenance employee who successfully identifies a turtle nest.

All turtles, turtle nests, or turtle eggs found by monitors or maintenance personnel will be safe-guarded by City staff until they can be relocated by appropriate authorities.

(2) Turtle Patrols
The City will ensure that daily patrols are carried out from 15 March to 1 October for the entire 7-mile stretch of beach within the project area, beginning at 6:30 am and ending at 6:30 pm. UTMSI will conduct volunteer turtle patrols daily from 15 March to 30 June, beginning around 6:30 am and concluding around 2:00 pm. The UTMSI patrols will extend from the south from the south jetty at Aransas Pass Inlet past the southern border of the City of Port Aransas (approximately 7 miles, including the entire proposed project area. Trained City staff will monitor this stretch of beach beginning at 2:00 pm, when the UTMSI volunteers conclude their patrols, and will continue until 6:30 pm. In the event that there is a lapse in volunteer coverage, the volunteer coordinator at UTMSI will notify City staff so that they may reassign personnel to cover for the absent volunteer.

(3) Training
The City will require all personnel involved in beach maintenance activities to receive training each year, prior to their involvement in cleaning activities. The scope of the training will include: 1) Identification of different turtle species; 2) Recognition of turtle tracks or crawls; 3) Basic procedures for recording turtle information if turtle returns to the water prior to the arrival of the turtle patrol team; 4) Protection of nest areas, 5) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

(4) Maintenance
No maintenance equipment shall enter a work area until an initial survey has been performed and they are notified by the monitor that it is clear to proceed. Initial surveys may be done by the monitor with the equipment prior to commencing work from 15 March to 30 March and again from 1 July to 30 September. Initial surveys from 1 April to 30 June should be completed by UTMSI as part of their annual volunteer turtle patrol activities.

If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the sighting location, and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence within 100 feet of the nest site until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. The City has stated that its staff will honor this commitment to cease maintenance activities within 100 feet of the nest site for a period no greater than 3 hours. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City has stated that its staff will flag the nest area and recommence work, making sure that the nest site is avoided.

All ruts and berms created by City equipment engaged in beach maintenance activities will be smoothed out to a target height of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment in use so that turtle tracks can be better identified and to prevent small turtles from becoming entrapped. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

Mechanical beach cleaning equipment shall attempt to limit penetration into the surface of the beach to depths of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment..

USACE will require the City to have a trained City-staff monitor or supervisor on-site when beach maintenance equipment is being used during the peak turtle nesting season from 15 March – 30 July.

The City will implement a monitoring plan requested by the USACE and coordinated with the Service.

If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredune.

The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m. If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (60.9 meters) to allow turtles to traverse these areas.

During beach maintenance activities, equipment will be driven above the "wet line" on the beach to more easily identify sea turtle tracks and minimize disturbance of birds.

The City will be allowed to build an approximately 20-foot wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be preset in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where berms are in place, they will attempt to create an unrestricted passage for the turtle by smoothing out the berm with a shovel or tool. As specified in other sections of this document, the proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest. The piles of sand, and the sculptures made from them, will be spaced so as to allow ample open beach for use by any nesting turtles. The sculptures and mounded sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

5) Education
The city will ensure that public education signs are posted at strategic locations in the project area. Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at PAIS. These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle sighting occurs.

(6) Notification
In the event a take occurs, the City will immediately notify both the USACE, Corpus Christi Regulatory Office and the US Fish & Wildlife Service Corpus Christi Field Office. From the time that a take occurs until 15 July of that calendar year the City will be required to have a monitor present with each work crew, while machinery is in operation.

(7) Annual Sea Turtle Report
A Sea Turtle Annual Report will be provided to the USACE by 1 February of each year. This report will include:

1. Summary of the number of turtles and turtle nests found that year by species
2. Map depicting the location of each nest
3. Number of takes, if any, by species
4. Summary of measures implemented during the project activities, relative success of those measures, and any recommendations for improving those measures

2.6.8 Conclusion

Despite an increase in nesting turtles within the project area, the risk to a Kemp's ridley sea turtle within the project area is still considered limited and will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. However, despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.7 HAWKSBILL SEA TURTLE

2.7.1 Reasons for Status

The hawksbill sea turtle *(Eretmochelys imbricata)* was Federally listed as endangered on June 2, 1970 (35 FR 8495), with critical habitat designated in Puerto Rico on May 24, 1978 (43 FR 22224). The greatest threat to this species is harvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices (recently $225/kilogram (kg)). Japanese imports of raw hawksbill shell (bekko) between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles. The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2000).

2.7.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they are typically found at depths of less than 70 feet. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter coastal waters when they reach a carapace length of approximately 8 to 10 inches. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2000).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish, fish, and plant material such as algae, submerged aquatic vegetation (SAV) and mangroves, which also have been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than the adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. They nest on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, these sand beaches are low energy with woody vegetation, such as sea grape *(Coccoloba uvifera),* near the waterline (NRC, 1990). The hawksbill is typically a solitary nester, which makes it harder to monitor nesting activity and success (NMFS, 2000).

2.7.3 Range

The hawksbill is circum-tropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas), south to Brazil (NMFS, 2000). In the continental U.S., the hawksbill nests only in Florida where it is sporadic at best (NFWL, 1980). However, a major nesting beach exists on Mona Island, Puerto Rico. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.7.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve post-hatchlings and juveniles, and sightings are primarily associated with stone jetties. Some are found washed ashore on south Texas Gulf beaches entangled in onion sacks or in association with large amounts of sargassum (Shaver, 2008). These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2000).

2.7.5 Presence in the Project Area

The hawksbill has been recorded from Nueces, Kleberg, Willacy, and Cameron counties (Dixon, 2000). Although unlikely, it is of potential occurrence in the project area. On June 13, 1998 the first hawksbill nest recorded on the Texas coast was found outside the project area at Padre Island National Seashore (Shaver, 1998). It contained 140 eggs of which 133 hatched and 132 were released into the Gulf (one weak hatchling was taken to a rehabilitation facility). This nest remains the only example documented on the Texas coast.

2.7.6 Effects of the Project

Because most of the sightings of the hawksbill sea turtle in the northern Gulf of Mexico occur at stone jetties, this species could occur near the stone jetty at Aransas Pass Inlet, just north of the project area. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.7.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.7.8 Conclusion

For the reasons cited in Section 2.7.6, the risk to a hawksbill sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the hawksbill sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the hawksbill sea turtle.

2.8 LEATHERBACK SEA TURTLE

2.8.1 Reasons for Status

The leatherback turtle *(Dermochelys coriacea)* was listed as endangered throughout its range on June 2, 1970 (35 FR 8495), with critical habitat designated in the U.S. Virgin Islands on September 26, 1978 and March 23, 1979 (43 FR 43688—43689 and 44 FR 17710—17712, respectively). Its decline is attributable to overexploitation by man and incidental mortality associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles have also been mentioned as causes for mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). Although nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change nesting beaches, current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide. The major threat is egg collecting, although they are also jeopardized to some extent by destruction or degradation of nesting habitat (NatureServe, 2000). Egg collecting is not currently a problem in Florida, but remains a problem in Puerto Rico and the U.S. Virgin Islands (NMFS and FWS, 1992). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped with turtle excluder devices (TEDs) because adult leatherbacks are too large to pass through the TED exit opening. While the TED exit opening size has been increased in the U.S., USFWS is unsure whether it has been increased in other countries. Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and FWS, 1992).

2.8.2 Habitat

The leatherback turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). It is most often found in coastal waters when nesting or following concentrations of jellyfish (TPWD, 2000), during which it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths.

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed (NFWL, 1980). The leatherback typically nests on beaches with a deepwater approach (Pritchard, 1971). No critical habitat has been designated within the project area.

2.8.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It is found in the Atlantic, Pacific and Indian oceans and occurs as far north as British Columbia, Newfoundland, Great Britain and Norway, as far south as Australia, Cape of Good Hope, and Argentina, and in other water bodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions and major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the

Atlantic and Gulf states of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2000).

The leatherback migrates further and ventures further into colder water than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 3,666 miles to Ghana, West Africa, after nesting in Surinam (NMFS and FWS, 1992). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.8.4 Distribution in Texas

According to FWS (1981), leatherbacks have never been common in Texas waters. Leatherback turtles tend to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf of Mexico, the leatherback is often associated with two species of jellyfish, the cabbagehead (*Stomolophus* sp.) and the moon jellyfish (*Aurelia* sp.) (NMFS and FWS, 1992). Leatherback turtle feeding aggregations—large occurrences of 100 turtles—were reported by Leary (1957) off Port Aransas in December 1956 and in the Brownsville Eddy in winter (Hildebrand, 1983). A leatherback turtle nest was found at Padre Island National Seashore on June 6, 2008; however, none of the eggs hatched (Shaver, 2008). Prior to this, no nests of this species have been recorded on Texas beaches for over 60 years. The last two reported, one from the late 1920s and one from the mid-1930s, were both from Padre Island (Hildebrand, 1982, 1986). Stranding records report 1 leatherback on the Texas coast in 2006 and 1 in 2007 (Orms, 2007).

2.8.5 Presence in the Project Area

The leatherback has been recorded from Nueces, Kenedy, and Cameron counties (Dixon, 2000). Although highly unlikely, the potential exists for this species to occur in the project area.

2.8.6 Effects of the Project

Of the five species of sea turtles occurring in Texas waters, the leatherback is the species least likely to be affected by the proposed project because of its rare occurrence on Texas beaches and its pelagic nature. No effects to this species are anticipated as a result of the project.

2.8.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.8.8 Conclusion

For the reasons cited in Section 2.8.6, the risk to a leatherback sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the leatherback sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the leatherback sea turtle.

2.9 GREEN SEA TURTLE

2.9.1 Reasons for Status

The green sea turtle *(Chelonia mydas)* was listed on July 28, 1978 as threatened except for Florida and the Pacific coast of Mexico (including the Gulf of California), where it was listed as endangered (43 FR 32808). The greatest cause of decline in green sea turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch during commercial shrimp trawling is a continued source of mortality that adversely affects recovery. It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green sea turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and subadults. Various other fishing operations also negatively impact this species (NMFS, 2000). Epidemic outbreaks of fibropapilloma or "tumor" infections recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). Some scientists suspect this disease to be linked to environmental alteration of sea turtle habitat by pollution and contaminants (FWS, 1998). This species is also subject to various negative impacts shared by sea turtles in general. According to Donna Shaver, an additional significant threat to the green sea turtle's survival is hypothermic stunning (Orms, 2008).

2.9.2 Habitat

The green sea turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and submerged aquatic vegetation (SAV). Individuals observed in the open ocean are believed to be migrants en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. Adults are primarily herbivorous, while juveniles consume more invertebrates. Principal food items include SAV, macroalgae and other marine plants, mollusks, sponges, crustaceans, and jellyfish (Mortimer, 1982; Green, unpubl. data).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galapagos Islands, green sea turtles have been observed basking on beaches (Balazs, 1980; Green, unpubl. data). They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994), although an individual might switch to a different nesting beach within a single nesting season (Green, unpubl. data).

2.9.3 Range

The green sea turtle is a circum-global species in tropical and sub-tropical waters. In U.S. Atlantic waters, it is found around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Ayes Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and FWS, 1991b; Hirth, 1997). Nesting numbers are increasing rapidly in Florida and Mexico (Orms, 2008).

2.9.4 Distribution in Texas

The green sea turtle in Texas inhabits shallow bays, rock passes, and estuaries where its principal foods, the various marine grasses and other SAV, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid to late nineteenth century, Texas waters supported a green sea turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the Lower Laguna Madre, although a few also came from Galveston Bay. They have also been documented in large numbers at Packery, Mansfield and Brazos Santiago Pass and observed at Fish Pass and at the Port Aransas Jetties (Orms, 2008). Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, with the last Texas turtler hanging up his nets in 1935. Incidental catches by fisherman and shrimpers were sometimes marked prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Reduced numbers of green sea turtles can still be found in these same bays today (Hildebrand, 1982). Although numbers of green turtles are much reduced over historic figures, their numbers are now starting to increase. While green sea turtles prefer to inhabit bays with SAV meadows, they may also be found in bays that are devoid of SAV. The green sea turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Juvenile green turtles are being reported in increasing numbers from surf waters of the Gulf of Mexico. Increasing numbers are also being found washed ashore on south Texas Gulf beaches in association with large amounts of sargassum (Shaver, 2008).

Green sea turtle nests are rare in Texas. Of the 722 turtle nests found on the Texas coast between 1979 and 2008, 26 were green sea turtle nests, all of which were found outside the project area on PAIS and one on South Padre Island. This includes five in 2008 outside the project area including four within PAIS and one on South Padre Island (Shaver, 2008). Three nests were found in 2007, two within PAIS and one on South Padre Island. Also included (all at PAIS) are two in 2006, 4 in 2005, 1 in 2004, 2 in 2003, 2 in 2002, and 1 in 2000. Observed juveniles are likely from Mexico and may return there to nest. There is a possibility that increased nesting of these juveniles in Texas could occur (Orms, 2008).

2.9.5 Presence in the Project Area

The green sea turtle has been recorded from Nueces, Kleberg, Kenedy, Willacy and Cameron counties (Dixon, 2000). There is potential for this species to occur in the project area, but individuals are most likely to be in transit through Aransas Pass Inlet en route to the back bays west of the project area. In Texas (Shaver, 2000, unpublished data), green sea turtle nests have only been documented at PAIS, south of the project area.

2.9.6 Effects of the Project

Because most of the sightings of the green sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the proposed project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities may impact nesting green sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.9.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.9.8 Conclusion

For the reasons cited in Section 2.9.7, the risk to green sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.10 LOGGERHEAD SEA TURTLE

2.10.1 Reasons for Status

The loggerhead sea turtle *(Caretta caretta)* was listed as threatened throughout its range on July 28, 1978 (43 FR 32808). The decline of the loggerhead, like that of most sea turtles, can be attributed to overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predatation. The most significant threats to its population are coastal development, commercial fisheries, and pollution (NMFS, 2000).

2.10.2 Habitat

The loggerhead is found in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers. It favors warm temperate and sub-tropical regions not far from shorelines. The adults occupy various habitats, from turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching, and often float in masses of sargassum. They may remain associated with sargassum for 3 to 5 years (NMFS and FWS, 1991b).

Commensurate with their use of varied habitats, loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conch, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Rebel, 1974; Hughes, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

Nesting occurs usually on open, sandy beaches above high-tide mark and seaward of well developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and sub-tropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995). No critical habitat has been designated for this species.

2.10.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf coast. In recent years, a few have nested on barrier islands along the Texas coast.

2.10.4 Distribution in Texas

The loggerhead is considered to be the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It is also the species most commonly sighted around offshore oil rig platforms and reefs and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when one of their food items, the Portuguese man-of-war, is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths are due to the activities of shrimp trawlers where turtles are accidentally caught in the nets and drown and their bodies dumped overboard. Prior to 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, five were confirmed in 2000, three in 2001, one in 2002, two in 2006, 5 in 2007, and 3 in 2008 (Shaver, 2000, 2002, 2007, 2008). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were marketed (Hildebrand, 1982). Today, even with protection, insufficient loggerheads exist to support a fishery.

2.10.5 Presence in the Project Area

The loggerhead has been recorded in Nueces County and in Kleberg County (Dixon, 2000) and in Corpus Christi Bay (Shaver, 2000). There is potential for this species to occur in the project area. Of the 722 sea turtle nests found on the Texas coast between 1979 and July 2008, 46 were loggerhead sea turtle nests, of which 33 were found on PAIS. During the last decade, nesting has remained stable on the Texas coast at 1-5 nests per year, the majority of which occur on the Padre Island National Seashore, south of the project area.

2.10.6 Effects of the Project

Because most of the sightings of the loggerhead sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities could impact nesting loggerheads sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.10.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.10.8 Conclusion

For the reasons cited in Section 2.10.6, the risk to loggerhead sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.11 SOUTH TEXAS AMBROSIA

2.11.1 Reasons for Status

The South Texas Ambrosia became listed as endangered on September 23, 1994 (50 CFR Part 17). Loss of habitat has led to the decline of this species. Conversion of habitat to agricultural fields and urban areas has limited the amount of habitat available for colonization. In addition, introduced species such as buffelgrass *(Cenchrus ciliaris)* and King Ranch bluestem *(Bothriochloa ischaemum var. songaricus)* compete with this and other natives of the coastal prairie. Invasion of prairie by shrub and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. Disturbance associated with activities occurring along road right-of-ways where the species is found may also be detrimental.

2.11.2 Habitat

South Texas ambrosia grows and blooms at low elevations in open clay-loam prairies and savannas among *Ayenia limitaris*, *Buchloe dactyloides*, *Stipa leucotricha* and *Bouteloua rigidiseta*. South Texas ambrosia was first collected in San Fernando, Tamaulipas, Mexico, by Luis Berlandier in 1835. The first U.S. collection was made by Robert Runyon in 1932 in Cameron County, Texas. It has since been found in Cameron, Jim Wells, Kleberg and Nueces Counties in South Texas. Six populations are known to exist in Nueces and Kleberg counties. No critical habitat has been designated for this species.

2.11.3 Range

South Texas ambrosia is known only from the southern tip of Texas and from Tamaulipas, Mexico (Correll and Johnston, 1970; Turner, 1983). It was first collected by J.L. Berlandier in San Fernando, Tamaulipas, Mexico in 1835 (Turner, 1983), but it was not until 1859 that Gray described this species as new to science. Historically, South Texas ambrosia was known only from Kleberg, Nueces, Jim Wells, and Cameron counties in the Gulf Prairie region of Texas and Tamaulipas in Mexico. The status of the Mexican populations is unknown.

2.11.4 Distribution in Texas

This species has been historically reported from Jim Wells and Cameron counties, although it is currently verified in six general locations in Nueces and Kleberg counties (TPWD, 1999a).

2.11.5 Presence in the Project Area

The South Texas Ambrosia is limited to coastal prairies with clayey soil and therefore would not be found in the project area, which is located totally on a sandy beach.

2.11.6 Effects of the Project

No effects to the South Texas Ambrosia are anticipated as a result of this project.

2.11.7 Conservation Measures

Because no potential effects to the South Texas Ambrosia will occur as a result of the proposed project, no additional conservation measures are needed.

2.11.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the South Texas Ambrosia.

2.12 WEST INDIAN MANATEE

2.12.1 Reasons for Status

The West Indian manatee *(Trichechus manatus)* was listed as endangered on June 2, 1970 (35 FR 8495). The largest known human-related cause of manatee mortality in Florida is collisions with hulls and/or propellers of boats and ships. The second-largest human-related cause of mortality in Florida is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (FWS, 1993). Hunting and fishing pressures were responsible for much of its original decline, as manatees were heavily hunted for meat, hides, and bones until they were nearly extirpated (FWS, 1995a).

A prominent cause of natural mortality in some years in Florida is cold stress. Major die-offs associated with the outbreaks of red tide have occurred, where manatees appear to have died due to ingestion of filter-feeding tunicates (incidentally ingested by manatees feeding on seagrasses) that had accumulated the neurotoxin-producing dynoflagellates responsible for causing the red tide (FWS, 1993; 1995b). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

2.12.2 Habitat

The manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range it appears to prefer rivers and estuaries to marine habitats, although manatees inhabit marine habitats in the Greater Antilles (Lefebvre et al., 1989). It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 20°C. In the northern portions of their range during October through April they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power plants. They prefer waters that are at least 3.3 to 6.6 feet in depth; along coasts they are often in water 9.9 to 16.5 feet deep. They usually avoid areas with strong currents (NatureServe, 2000).

Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability. They may opportunistically eat other foods such as acorns in early winter in Florida or fish caught in gill nets in Jamaica (O'Shea and Ludlow, 1992).

2.12.3 Range

The manatee ranges from the southeastern U.S. and coastal regions of the Gulf of Mexico, through the West Indies and Caribbean, to northern South America. United States populations occur primarily in Florida (NatureServe, 2000), where they are effectively isolated from other populations by the cooler waters of the northern Gulf of Mexico and the deeper waters of the Straits of Florida (Domning and Hayek, 1986).

2.12.4 Distribution in Texas

Manatees are extremely rare in Texas, although in the late 1800s they apparently were not uncommon in the Laguna Madre. Recent Texas records also include specimens from Cameron, Willacy, Galveston, and Matagorda counties (FWS, 1995a); Davis and Schmidly (1994) describe a Texas record of a manatee found dead in the surf near Bolivar Peninsula near Galveston in 1986. Manatees may travel great distances (200 km or more) along the coast or between islands (FWS, 1995a). In the Corpus Christi Bay area, a manatee was sighted at Fish Pass on October 2, 1979 and another near the Naval Air Station in October and November 1995 (Price-May, 2002). Albert Oswald of the Texas State Aquarium spotted a manatee in the inlet between the Texas State Aquarium and the Lexington Museum on September 23, 2001. This is the third and probably most reliable sighting of the manatee in Corpus Christi Bay (Beaver, 2001). More recently in 2005, a manatee was spotted throughout the month of May in the Port Mansfield Harbor (KGBT Channel 4, 2005) and April 2006 (Wilson, 2006).

2.12.5 Presence in the Project Area

The manatee has been spotted in the Corpus Christi Bay area, and though highly unlikely, may access waters adjacent to the project area by way of Aransas Pass Inlet.

2.12.6 Effects of the Project

While the West Indian manatee has been recently sighted in back bay habitats to the southwest of the project area, such occurrences are extremely rare, and the likelihood that any individuals would end up in the waters adjacent to proposed project area is extremely unlikely. Regardless, the proposed activities will not affect aquatic habitats and thus have no potential to affect the West Indian manatee.

2.12.7 Conservation Measures

Because no potential effects to the West Indian manatee are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.12.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the West Indian manatee.

2.13 WHOOPING CRANE

2.13.1 Reasons for Status

The whooping crane *(Grus americanus)* was listed as endangered on March 11, 1967 (F.R. Doc. 67-2721). The whooping crane population, estimated at 500 to 700 individuals in 1870 declined to only 16 individuals in the migratory population by 1941 as a consequence of hunting and specimen collection, human disturbance, and conversion of the primary nesting habitat to hay, pastureland, and grain production. The main threat to whooping cranes in the wild is the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas coast. Collisions with power lines and fences are known hazards to wild whooping cranes. The primary threats to captive birds are disease and parasites. Bobcat predation has been the main cause of mortality in the Florida experimental population. (FWS, 2001).

2.13.2 Habitat

The nesting area in Wood Buffalo National Park is a poorly drained region interspersed with numerous potholes. Bulrush is the dominant emergent in the potholes used for nesting. On the wintering grounds at Aransas National Wildlife Refuge in Texas, whooping cranes use the salt marshes that are dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye. They also forage in the interior portions of the refuge, which are gently rolling, sandy, and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak, redbay, Bermuda grass, and bluestem. The non-migratory, Florida release site at Kissimmee Prairie includes flat, open palmetto prairie interspersed with shallow wetlands and lakes. The primary release site has shallow wetlands characterized by pickerel weed, nupher, and maiden cane. Other habitats include dry prairie and flatwoods with saw palmetto, various grasses, scattered slash pine, and scattered strands of cypress. Areas selected for the proposed eastern migratory experimental population closely mimic habitat of the naturally occurring wild population in Canada and Texas (FWS, 2001).

2.13.3 Range

Historic: The historic range of the whooping crane once extended from the Arctic coast south to central Mexico, and from Utah east to New Jersey, into South Carolina, Georgia, and Florida. The historic breeding range once extended across the north-central United States and in the Canadian provinces, Manitoba, Saskatchewan, and Alberta. A separate non-migratory breeding population occurred in southwestern Louisiana (FWS, 2001).

Aransas/Wood Buffalo Population: The current nesting range of the self-sustaining natural wild population is restricted to Wood Buffalo National Park in Saskatchewan, Canada and the current wintering grounds of this population are restricted to the Texas Gulf Coast at Aransas National Wildlife Refuge and vicinity. It is experiencing a gradual positive population trend overall, although some years exhibit stationary or negative results. In January, 2000, there were 187 individuals in the flock, including 51 nesting pairs (FWS, 2001).

An aerial whooping crane census was conducted March 4-5, 2008 at the Aransas National Wildlife Refuge and surrounding areas. The estimated size of the flock is listed at 266 birds, consisting of an estimated 144 adults, 83 subadults, and 39 juveniles. The total number of whooping cranes located on the census was actually 268, with presumably at least 3 cranes that moved and were counted twice. With the flight conducted on two consecutive afternoons, it is expected that a few cranes moved between portions of the census area and were counted on both days (Stehn, 2008).

Rocky Mountain Experiment: In 1975, an effort to establish a second, self-sustaining migratory flock was initiated by transferring wild whooping crane eggs from Wood Buffalo National Park to the nests of greater sandhill cranes at Grays Lake National Wildlife Refuge in Idaho. This Rocky Mountain population peaked at only 33 birds in 1985. The experiment terminated in 1989 because the birds were not pairing and the mortality rate was too high to establish a self-sustaining population. In 1997, the remaining birds in the population were designated as experimental, non-essential to allow for greater management flexibility and to begin pilot studies on developing future reintroduction methods. In 2001, there were only two remaining whooping cranes in this population (FWS, 2001), and in October 2007, the number was down to zero (Whooping Crane Eastern Partnership, Feb. 2008).

Captive Populations: As of October 2007, there were 148 captive whooping cranes held at eleven facilities (Whooping Crane Eastern Partnership, Feb. 2008). Four facilities: Patuxent Wildlife Research Center, International Crane Foundation, Calgary Zoo, and San Antonio Zoo are considered to have successful breeding programs. Chicks produced at the captive facilities either remain in captivity to maintain the health and genetic diversity of the captive flock, or are reared for release to the wild in the experimental reintroduction programs (FWS, 2001).

Florida Experimental Nonessential Population: An experimental reintroduction of whooping cranes in Florida was initiated in 1993 to establish a non-migratory population at Kissimmee Prairie. A non-migratory population avoids the hazards of migration, and by inhabiting a more geographically limited area than migratory cranes, individuals can more easily find compatible mates. From 1993 to 2001, 233 isolation-reared whooping cranes had been released in the area. In spring 2000, there were 65 individuals in the project area with 10 pairs defending territories and evidence of the first successful hatching of chicks (FWS, 2001). As of October 2007, this number is now 41 with 17 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

Eastern Migratory Population: A second experimental non-essential population is currently being reintroduced to eastern North America (FWS, 2001). The intent is to establish a migratory flock which would summer and breed in central Wisconsin, migrate across the seven states and winter in west-central Florida. The birds are taught the migration route after being conditioned to follow costumed pilots in ultralight aircraft. Initial experiments using sandhill cranes, completed in the Fall of 2000, successfully led 11 cranes 1,250 miles from Necedah National Wildlife Refuge in Wisconsin to Chassahowitzka National Wildlife Refuge in Florida. The birds winter in Florida and then migrate back to Wisconsin on their own in the spring.

Following this success, the first attempt to lead whooping cranes was made in 2001. Seven birds made it to Florida and the five that survived the winter returned to central Wisconsin the following spring. An additional 16 birds were successfully reintroduced to the flyway in 2002. In 2006, the total re-introduced population reached a high of 82 birds. In February 2007, 17 young birds of the 2006 hatching season were lost due to a severe storm at Chassahowitzka National Wildlife Refuge. There are currently attempts to establish a second wintering site at St. Marks National Wildlife Refuge, also on the Florida Gulf Coast, as a precaution against potentially similar circumstances in the future. As of spring 2008, it is expected that 76 cranes will migrate north as part of this eastern flock with 4 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

2.13.4 Distribution in Texas

The Aransas-Wood Buffalo population of cranes migrates southeasterly through Alberta, Saskatchewan and eastern Manitoba, stops-over in southern Saskatchewan, and continues through the Great Plains states of eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas (FWS, 2007). About 9,000 hectares of salt flats on Aransas National Wildlife Refuge and adjacent islands comprise the principal wintering grounds of the whooping crane. Marshes are dominated by salt grass (*Distichlis spicata*), saltwort (*Batis maritima*), smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia* sp.), and sea ox-eye (*Borrichia frutescens*). Inland margins of the flats are dominated by Gulf cordgrass (*Spartina spartinae*). Interior portions of the refuge are gently rolling and sandy and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak (*Quercus virginiana*), redbay (*Persea borbonia*), and bluestem (*Andropogon* spp.). In the last 30 years, many upland sites have been grazed, mowed, or burned under controlled conditions to maintain oak savannah habitat. The refuge maintains as many as 3,300 ha of grassland for cranes, waterfowl, and other wildlife. Human visitation is carefully controlled, and other potentially conflicting uses of the refuge, such as activities associated with oil and gas exploration, are reduced when whooping cranes are present (FWS, 2007).

2.13.5 Presence in the Project Area

The whooping crane has been recorded in Nueces County, and may potentially access waters on the bay side and interior of Mustang and Padre Islands outside the project area. There has never been a whooping crane sighting on a beach or dry dune system (Stehn, 2008).

2.13.6 Effects of the Project

While the whooping crane has been recently sighted in Nueces County, such occurrences are rare. Given its rarity and suitable habitat only in waters on the leeward side and interior of the barrier islands, combined with the fact that this project site is on a Gulf beach and not in a suitable habitat where this species frequents, this project will not affect the whooping crane.

2.13.7 Conservation Measures

Because no potential effects to the whooping crane are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.13.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the whooping crane.

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Attachment 1

Permit Application Drawings

Attachment 2

Habitat Monitoring

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008

TABLE OF CONTENTS

INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be

permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of

sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks –** Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake –** This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks –** Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A -** High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B -** Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C -** Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 ft. long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 ft. long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 ft. long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 ft. survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 ft. survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 ft. survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 ft. survey area (location to be determined)

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous

beach profile within the 200 ft. survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 ft. survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 ft. long survey area. The number of birds, species types, behavior, and location within the 200 ft. survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

REPORTING RESULTS

The City's consultant compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

REPLY TO
ATTENTION OF:

Regulatory Branch

SUBJECT: Consultation No. 21410-2008-I-0099; SWG-2007-1847

U.S. Fish & Wildlife Service
Attn: Mr. Alan Strand
Field Supervisor
Ecological Services
TAMU-CC Box 338
Corpus Christi, TX 78412

Dear Mr. Strand:

This letter is in reference to your December 31, 2007 letter regarding Consultation Number 21410-2008-I-0099, submitted in response to our November 30, 2007 public notice for proposed beach maintenance activities by the City of Port Aransas. The purpose of this letter is to proceed with consultation with your agency as recommended in your letter.

Subsequent to the public notice and your letter, consultation No. 21410-2006-F-0265 was initiated and concluded on a very similar permit application for the City of Corpus Christi. The formal coordination concluded with Biological Opinion (BO) from you office, dated September 5, 2008. Critical elements from the Biological Assessment relative to the piping plover and sea turtles that were instrumental in your BO have been incorporated into the Biological Assessment (BA) for this project, as attached and dated December 5, 2008.

Based on the effects of the project as proposed and the Conservation Measures and habitat monitoring to be implemented, all as outlined in the attached BA, we have concluded the following:

No effect - Gulf Coast jaguarundi, ocelot, slender rush pea, South Texas ambrosia, West Indian manatee, and whooping crane.

May affect, but is not likely to adversely affect – brown pelican, piping plover, hawksbill sea turtle, and leatherback sea turtle.

May affect, and is likely to adversely affect – Kemps Ridley sea turtle, green turtle, and loggerhead sea turtle.

WONG/jw/361-814-5847
CESWG-PE-RCC

By this letter and the attached Biological assessment we request your concurrence of our conclusions on the affect of the project on these species. By this letter we further request the initiation of formal consultation as of this date pursuant to Section 50 CFR Part 402.14.

Should you have any questions, please contact the Project Manager, John Wong, at the above letterhead address or by telephone at 361-814-5847.

MULLINS LM
PE-RCC 12-10-08

Sincerely,

Casey Cutler
Assistant Chief, Regulatory Branch

CUTLER
PE-R

Enclosure

Copy furnished:

Mr. Jeff Pollard
HDR/Shiner Moseley and Associates, Inc.
Corpus Christ

PLEASE RETURN TO
CESWG-PE-RCC

DEC 1 9 2008

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

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DEC 1 9 2008

WONG/jw/361-814-5847
CESWG-PE-RCC

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MULLINS
PE-RCC

Sincerely,

Casey Cutler
Assistant Chief, Regulatory Branch

CUTLER
PE-R

Enclosure

Copy furnished:

Mr. Jeff Pollard
HDR/Shiner Moseley and Associates, Inc.
555 N. Carancahua, Suite 1650
Corpus Christi, TX 78478

PLEASE RETURN TO
CESWG-PE-RCC

DEC 1 9 2008

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

DEC 1 6 2008

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ATTENTION OF:

Regulatory Branch

SUBJECT: Consultation No. 21410-2008-I-0099; SWG-2007-1847

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By this letter and the attached Biological assessment we request your concurrence of our conclusions on the affect of the project on these species. By this letter we further request the initiation of formal consultation as of this date pursuant to Section 50 CFR Part 402.14.

Should you have any questions, please contact the Project Manager, John Wong, at the above letterhead address or by telephone at 361-814-5847.

Sincerely,

Casey Cutler
Assistant Chief, Regulatory Branch

Enclosure

Copy furnished:

Mr. Jeff Pollard
HDR/Shiner Moseley and Associates, Inc.
555 N. Carancahua, Suite 1650
Corpus Christi, TX 78478

PLEASE RETURN TO
CESWG-PE-RCC

BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES

DEPARTMENT OF THE ARMY PERMIT APPLICATION SWG-2007-01847
BY
CITY OF PORT ARANSAS

U.S. ARMY ENGINEER DISTRICT, GALVESTON
DECEMBER 5, 2008

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this Biological Assessment (BA) is to fulfill the U.S. Army Corps of Engineer's (USACE) requirements as outlined under Section 7(a) of the Endangered Species Act (ESA) of 1973 as amended. The proposed action requiring the assessment is Department of the Army (DA) permit application SWG-2007-1847 which would authorize beach maintenance activities along a 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits north to Lantana Drive in Port Aransas, Mustang Island, Nueces County, TX. The work is proposed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Table 1 is a list of federally listed species in Nueces County presented in this BA. For the purposes of this BA, the project area is defined as the area where the actual beach maintenance will take place, as depicted in the DA 24192 permit application drawings (Attachment 1).

1.2 DESCRIPTION OF THE PROPOSED ACTION

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide
**only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

<u>Schedule of Work</u>:
Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance (Attachment 1, Sheet 2):

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (7:00 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

Any additional work conducted on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from

below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks**- Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment** - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities consistently result in ruts greater than two inches deep, the City has stated that retrofitting of tires will be considered. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City maintains that they will not commit to anything more than consideration of this practice at this time.

The City of Port Aransas typically has the following Public Works Staff assigned to beach maintenance:

- **4 Full-time Heavy Equipment Operators** - Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; primarily responsible for removal of sargassum and roadway maintenance.

- **2 Supervisors** - Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff. Also can be responsible for running all heavy equipment such as front-end loaders, tractors, and motor.

- **6 Full-time Ground Custodians** – Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.

- Between 15 March and 30 July of each year, a trained turtle monitor will be onsite in the immediate area where the beach is being maintained while activities are underway to be alert for any sign of turtles or turtle nests which may be impacted. Additionally, the monitor will advise the City as to the degree of any rutting that may be occurring as a result of the beach maintenance.

1.3 SUMMARY OF ALTERNATIVES CONSIDERED

City staff has conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives.

Off-site Disposal

As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law prohibits any sand from being removed from a barrier island.

Non-mechanized Removal

Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

Mechanical Alternatives

The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

No and Minimal Action Alternatives

The City has already initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

Alternative	Meets Objectives?	Physically Practical?	Financially Practical?	Legally acceptable?
No-action	No	Yes	Yes	No
Non-mechanized maintenance	No	No	Yes	Yes
Mechanized maintenance (off-site disposal)	Yes	No	No	No
Mechanized maintenance (on-site disposal)	Yes	Yes	Yes	Yes

2.0 IMPACT ASSESSMENT FOR LISTED SPECIES

To assess the potential impacts of the proposed project on endangered and threatened species, USACE Galveston District personnel and the applicant had meetings with the FWS, telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on these species. Significant literature sources relied upon in the preparation of this BA include the FWS series on endangered species of the seacoast of the U.S. (National Fish and Wildlife Laboratories (NFWL), 1980), Federal status reports and recovery plans, and performance reports of the Texas Parks and Wildlife Department (TPWD).

Of the 13 endangered species listed in Table 1 that are potentially present in the project area, possible impacts to the piping plover and five species of sea turtle have been identified to result from this project.

TABLE 1
ENDANGERED AND THREATENED SPECIES OF POTENTIAL OCCURRENCE IN THE DA PERMIT APPLICATION SWG-2007-1847 PERMIT AREA IN NUECES COUNTY, TEXAS[1]

Common Name	Scientific Name	Federal Listing Status
Gulf Coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered
Ocelot	*Leopardus pardalis*	Endangered
Brown pelican	*Pelecanus occidentalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened w/critical habitat in Texas
Slender Rush Pea	*Hoffmannseggia tenella*	Endangered
Kemps Ridley turtle	*Lepidochelys kempii*	Endangered
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered w/critical habitat designated (or proposed) outside Texas
Leatherback sea turtle	*Dermochelys coriacea*	Endangered w/critical habitat designated (or proposed) outside Texas
Green sea turtle	*Chelonia mydas*	Threatened w/critical habitat designated (or proposed) outside Texas
Loggerhead sea turtle	*Caretta caretta*	Threatened
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered
West Indian Manatee	*Trichechus manatus*	Endangered
Whooping Crane	*Grus americana*	Endangered

[1] According to U.S. Fish and Wildlife Service letter dated December 31, 2007 regarding DA application SWG-2007-1847.

2.1 GULF COAST JAGUARUNDI

2.1.1 Reasons for Status

The jaguarundi *(Herpallurus yagouaroundi cacomitli)* was listed by FWS as endangered on June 14, 1976 (41 FR 24064). Habitat loss and alteration due to brush-clearing activities, and human persecution are the main causes for the decline in jaguarundi populations (FWS, 1995a).

2.1.2 Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6% of the land area in south Texas is this type of habitat (Tewes and Everett, 1987). The thickets do not have to be continuous and may be interspersed with clear areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn, 1970; Davis and Schmidly, 1994). In South America, habitat includes high mountain forests, tropical forests, swamp forests, savannahs, overgrown pastures, and thickets (NFWL, 1980; Tewes and Schmidly, 1987).

The most common plants occurring in habitats in the Rio Grande Valley where the jaguarundi is known to occur are huisache, blackbrush acacia, prairie baccharis *(Baccharis texana)*, chillipiquin *(Capsicum annuum)*, lotebush, allthorn goatbush, Texas persimmon *(Diospyros texana)*, coyotillo *(Kawinskia humboldtiana)*, common lantana *(Lantana horrida)*, berlandier wolfberry *(Lycium berlandieri)*, javelina brush *(Microrhamnus ericoides)*, Texas prickly pear *(Opuntia lindheimen)*, retama, honey mesquite, cedar elm *(Ulmus crassifolia)*, and lime pricklyash *(Zanthoxylum fagara)* (Goodwyn,1970).

Jaguarundis have two distinct color phases, red and gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Felis eyra*. A third color phase, black, has also been reported, but apparently does not occur in Texas (Goodwyn, 1970).

Like the ocelot, the jaguarundi is primarily nocturnal, although some diurnal activity has been recorded. Jaguarundis are excellent climbers although they spend most of the time on the ground. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Jaguarundis communicate by calls, of which 13 have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley, 1976).

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets, hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Young have been born in March and August and possibly two litters occur per year. Usually 2 to 4 young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Gestation (for captive jaguarundi) varies from 63 to 75 days (Goodwyn, 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994).

2.1.3 Range

The jaguarundi historically occurred in southeast Arizona, south Texas, and Central and South America as far south as northern Argentina. Today this cat has a similar distribution, but in much reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly, 1987). The presence of jaguarundis in Florida is likely the result of human introduction (Nowak and Paradiso, 1983).

Four North American subspecies are recognized, of which two occur in the U.S.: *H.y. cacomitli* from southern Texas to central Vera Cruz, Mexico, and *H.y. tolteca* from southern Arizona, along the Pacific coast of Mexico, and inland to the Mexican Plateau (Goodwyn, 1970; NFWL, 1980).

2.1.4 Distribution in Texas

Tewes and Everett (1987) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundis (and ocelots) in Texas. Many of the reports were solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf coast as well as from south Texas. Two dead jaguarundis were reported in Cameron County and one each in Willacy and Webb counties. Tewes (1987) and Tewes and Everett (1987) documented several other credible reports of jaguarundis in these three counties. One of these was of a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Kellers Corner) in Cameron County on April 21, 1986 (Tewes, 1987; Laack and Rappole, 1 987b). Although this was the last confirmed record of a jaguarondi in Texas (Laack, 1998), unconfirmed jaguarundi sightings in Hidalgo County include Bentsen Rio Grande State Park, Santa Ana NWR, Lower Rio Grande Valley NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the TPWD Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Unconfirmed but reliable sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous, 1989). Recent jaguarundi sightings have been reported from the Santa Ana NWR for March 1998 (Santa Ana NWR data). Based on sighting reports, personnel of the Santa Ana NWR suspect the presence of jaguarundis on the refuge (Benn, 1997).

Tewes and Everett (1987) concluded that until verifiable evidence of jaguarundis from central Texas and the upper Gulf coast was forthcoming, jaguarundi distribution in Texas should be considered as restricted to the Rio Grande Valley. The number of jaguarundis in Texas is unknown, but certainly less than that of ocelots.

2.1.5 Presence in the Project Area

Jaguarundis are not known to occur within the project area due to lack of suitable habitat. The last documented siting of the species occurred more than 130 miles south of the project area on the mainland where suitable thorn-scrub habitat is available.

2.1.6 Effects of the Project

This project is expected to have no effect on the jaguarundi, as it is unlikely to occur on the beach area near project activities due to the lack of suitable brushy habitat.

2.1.7 Conservation Measures

Because no potential effects to the jaguarundi will occur as a result of the proposed project, no additional conservation measures are needed.

2.1.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the jaguarundi.

2.2 OCELOT

2.2.1 Reasons for Status

The ocelot *(Leopardus pardalis)* is listed as endangered throughout its present range (FWS, 1995a, 2000b). Habitat destruction and degradation due to brush-clearing has been the major cause for its population decline, but predator control activities and hunting have also contributed. In Central and South America, exploitation for the fur and pet trade is primarily responsible for population declines (NFWL, 1980; FWS, 1995a).

2.2.2 Habitat

The ocelot occupies a variety of habitats throughout its neotropical range including tropical and subtropical forests, riverine forests, swampy savannahs, estuarine mangroves, rocky areas, and upland oak forests (NFWL, 1980; Tewes and Schmidly, 1987; Murray and Gardner, 1997). In Texas, however, ocelots inhabit dense, often thorny and impenetrable brush, mesquite-oak and oak forests, and partially cleared land (NFWL, 1980; Navarro, 1985). Tewes (1986) found honey mesquite, acacias, condalia *(Condalia* spp.), allthorn goatbush *(Castella toxana),* granjeno, cenizo, and whitebrush *(Aloysia texana)* to be the dominant brush species of ocelot habitat in south Texas. Approximately 1.6% of the land area in south Texas now supports this type of habitat (Tewes and Everett, 1987).

Tewes and Everett (1987) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A or optimal habitat was 95% canopy cover, Class B or suboptimal habitat was 75% to 95% canopy cover, and Class C, with 75% or less canopy cover, was considered inadequate. The most critical component of habitat is probably dense cover near the ground (<3 feet in height) (Tewes, 1986).

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro, 1985; Tewes, 1986; Tewes and Schmidly, 1987). Navarro (1985) found ocelots in Texas to have two peaks of activity, one at about midnight and the other at daybreak. Ocelots feed on small and medium-sized mammals such as woodrats *(Nootoma* spp.), rabbits *(Sylvilagus* spp.), young deer *(Odocoious* spp.), nutria *(Myocastor coypus),* birds, reptiles, amphibians, fish, insects and, in Latin America, spider monkeys *(Ate/es* sp.), coatis *(Nasua nasua),* and agoutis *(Agouti* sp.) (Hall and Dalquest, 1963; Guggisberg, 1975; Navarro, 1985; Tewes and Schmidly, 1987; Emmons, 1988).

Although breeding occurs throughout the year in the tropics, it occurs primarily in the fall (September through November) in Texas; however, births have also been recorded in April, June, July and August. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Petrides et al., 1951; Navarro, 1985; Tewes, 1986; Laack and Rappole, 1986, 1987a; Tewes and Schmidly, 1987). Gestation is 70 to 80 days. Litter size ranges from two to four, with two being the most common. The mother provides extended parental care to the young because it takes time for them to become proficient at capturing prey. Males are believed to contribute little towards direct parental care (Tewes, 1986). Ocelots in the wild become sexually mature at 16 to 18 months (Schauenberg, 1979), but in captivity, maturity may be reached in as little as 10 to 12 months.

Navarro (1985) found that the average home range (the area that an animal occupies during its normal daily activities) for three male ocelots in south Texas was 618 acres, and for one female was 519 acres. Similarly, Twedt and Rappole (1986) reported home ranges of 865 and 296 acres for two male ocelots on Yturria Ranch in Willacy and Kenedy counties. However, Tewes (1986), using a much larger database, found the average home range of south Texas ocelots to be 4,372 acres for males and 2,717 acres for females. The overall average for adults was 3,754 acres. Although male ocelots had larger territories than the females and generally covered an extensive area in a short period, females used the home range more intensively (Tewes, 1986; FWS, 1990b). Tewes (1986) also determined that home ranges expanded in the winter and contracted in the summer. Both Navarro (1985) and Tewes (1986) found little overlap in the home ranges of adjacent males, but quite a considerable intersexual spatial overlap in the home ranges. Tewes and Schmidly (1987) and Navarro (1985) also found that the home ranges were closely aligned with the amount of suitable available habitat. At Laguna Atascosa NWR, for example, an increase in the ocelot population has resulted in smaller home ranges, two ocelots occupying an area that had previously supported only one (Tewes, 1988). Some individuals there currently inhabit areas as small as 80 acres (Tewes, 1988).

2.2.3 Range

Historically, the ocelot occurred in Arkansas, Arizona, southern California, and south through Central and South America to Peru, Uruguay, and northern Argentina (Navarro, 1985). Today it ranges from Arizona and Texas through Central and South America to northern Argentina, but in reduced numbers (Tewes and Everett, 1987; Emmons, 1990; Murray and Gardner, 1997).

2.2.4 Distribution in Texas

The ocelot once occurred in the eastern, central and southern portions of Texas, but currently only exists in the extreme south of the State (Davis and Schmidly, 1994). As a first step to determining the status of the ocelot in Texas, a clearinghouse for ocelot (and jaguarundi) sightings was established in October 1981 to coordinate reception and filing of reports. A total of 1,572 questionnaires was mailed to trappers to obtain additional information; of these, 472 (30%) were returned and 87 (6%) contained positive responses (Tewes and Everett, 1987). From these results, it appears that two significant populations of ocelots exist in south Texas. One population inhabits parts of Hidalgo, Starr, Cameron, and Willacy counties, and the other, Jim Wells, Live Oak, McMullen and Atascosa counties. Six or seven smaller populations may also occur. Based on studies of spatial patterns and densities of radio-collared ocelots, Tewes (1986) estimated that only 80 to 120 ocelots occur in Texas. Laack (1998) currently puts this number at 100. A population of approximately 30 to 40 ocelots occurs on the Laguna Atascosa NWR in Cameron County (Laack, 1998). One or two ocelots apparently occur at the Santa Ana NWR (Benn, 1997; Laack, 1998), and one pair of ocelots had territories near the Arroyo Colorado in Cameron County (Laack, 1998). Ocelots have been sighted at the NAS's Sabal Palm Grove Sanctuary (Homerstad, 1986); and at the Loma de Grulla complex north of Laguna Vista, at Moranco Blanco, and at Redhead Ridge (Tewes, 1987). Ocelot sightings have also been reported from the Lower Rio Grande Valley NWR. In addition, Laack and Rappole (1986, 1987a), Tewes (1987) and Homerstad (1987) have documented several other ocelot sightings in Cameron County. The closest ocelot population in Mexico is near San Fernando, approximately 100 miles south of the U.S.-Mexico border (Laack, 1998).

2.2.5 Presence in the Project Area

Ocelots are not known to occur within the project area due to lack of suitable habitat. Species populations are known to occur more than 130 miles south, and more than 50 miles west of the project area on the mainland where dense, brushy habitat is present.

2.2.6 Effects of the Project

This project is not expected to affect the ocelot, since it is unlikely to occur in the vicinity of project activities due to the lack of suitable brushy habitat in these areas.

2.2.7 Conservation Measures

Because no potential effects to the ocelot will occur as a result of the proposed project, no additional conservation measures are needed.

2.2.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the ocelot.

2.3 BROWN PELICAN

2.3.1 Reasons for Status

The brown pelican *(Pelecanus occidentalis)* was listed as endangered throughout its foreign range on June 2, 1970 (35 FR 8495) and throughout its U.S. range on October 13, 1970 (35 FR 16047). Population declines were attributed largely to chlorinated hydrocarbon residues from the use of pesticides, such as DDT compounds (DDE, DDD, and DDT), polychlorinated biphenyls (PCBs), dieldrin, and endrin, which caused eggshell thinning; thus, eggs became desiccated and were more easily broken during incubation (NFWL, 1980). Other factors included human disturbance and loss of habitat due to commercial and residential development (FWS, 1995a). Pelicans are large, heavy birds and easily flushed from the nest. Flushing exposes the eggs and young to predation, temperature stress and permanent abandonment by the parents.

A ban on the use of DDT in the U.S. in 1972, together with efforts to conserve and improve remaining populations, has led to increased numbers of brown pelicans. Populations in some areas have increased to historical breeding levels or above, with stable population numbers and productivity. The brown pelican has been delisted along the U.S. Atlantic coast and, in Florida and Alabama, along the Gulf coast. It remains endangered throughout the rest of its range, which includes Mississippi, Louisiana, Texas, California, Mexico, Central and South America, and the West Indies. In May 1998, the FWS announced its intention to either delist or downlist to threatened status numerous species, including the brown pelican (63 FR 25502—25512; May 8, 1998).

2.3.2 Habitat

Brown pelicans inhabit shallow coastal waters with water depths up to 80 feet (Palmer, 1962; NFWL, 1980; Fritts et al., 1983). They are rarely found inland and do not venture more than 20 miles out to sea except to take advantage of particularly good feeding situations (FWS, 1980). Distances of 61 miles from shore have been recorded (Fritts et al., 1983). Brown pelicans, which are colonial nesters, usually nest on undisturbed offshore islands in small bushes and trees, including mangroves, and in humid forests (NFWL, 1980; Guzman and Schreiber, 1987). Occasionally they nest on the ground and preferred sites are those free from human disturbance, flooding, and terrestrial predators, such as raccoons and coyotes. Brown pelicans utilize beaches, sandbars, sand spits, mud flats and even manmade structures such as piers, wharves, pilings, oil/gas platforms, and docks for loafing (NFWL, 1980). No critical habitat has been designated for this species.

2.3.3 Range

The brown pelican occurs along the Pacific coast of the Americas from southern British Columbia south to Cape Horn and throughout the Atlantic, Gulf and Caribbean coastal areas from New Jersey south to eastern Venezuela. In North America, it occasionally ventures inland north to North Dakota, Ontario and Nova Scotia. Its breeding range is more restricted: along the Pacific coast from central California south to Chile, including the Galapagos Islands; and from North Carolina, south to eastern Venezuela, the West Indies, Greater Antilles, and Virgin Islands (American Ornithologists' Union (AOU), 1998).

In North America, two subspecies are recognized: the eastern brown pelican (*P.o. carolinensis*) ranging from North Carolina south through Florida and west to Texas, and the California brown pelican (*P.o. californicus*) in California (NFWL, 1980). For the eastern subspecies, the present range is the same as the historical one, but in reduced numbers. It became extirpated in Louisiana in 1966, but has since (beginning in 1968) been reintroduced from Florida. It has never been known to nest in Mississippi or Georgia (FWS, 1980; 50 FR 4938, February 9, 1985). Brown pelican colonies are known to occur on the east coast of Mexico off the eastern tip of the Yucatan Peninsula (Mabie, 1986, 1988).

While some migration occurs after nesting in both subspecies, many individuals overwinter close to their breeding grounds (FWS, 1980). Atlantic coast populations move southward in the fall, with most birds wintering in the U.S., particularly in Florida. Some birds, however, disperse to the Cuban coast (Clapp et al., 1982). Gulf coast birds tend to remain on the Gulf coast, although Texas and Louisiana birds have been recovered in Mexico and Cuba (Palmer, 1962; Clapp et al., 1982).

2.3.4 Distribution in Texas

Historically, the brown pelican was a common bird of the Texas Gulf coast with an estimated breeding population of 5,000 pairs residing in 17 colonies in 1918 (Mabie, 1990). By the 1960s, however, it was almost extirpated. In 1963, only 14 breeding pairs were recorded along the Texas coast and in 1964 no known nesting occurred (Mabie, 1986). The decline started during the 1920s and 1930s due to human disturbance (Oberholser, 1974), but continued due to pesticide contamination (King et al., 1977; Mabie, 1986). Since the 1960s, the brown pelican has made a gradual comeback in Texas with an estimated 2,400 breeding pairs in 1995 (Campbell, 1995). Most of the breeding birds have traditionally been found on Pelican Island in Corpus Christi Bay, Nueces County, and Sundown Island near Port O'Connor in Matagorda County. Smaller groups or colonies occasionally nest on Bird Island in Matagorda Bay, a series of older dredged material islands in West Matagorda Bay, Dressing Point Island in East Matagorda Bay, and islands in Aransas Bay (Campbell, 1995). No current nesting sites are known from the lower

Texas Coast. Although brown pelican colonies are not monitored every year, 1,900 and 750 pairs nested on Pelican Island in 2003 and 2004 respectively, and on Sundown Island, 1,714 pairs nested in 2005 and 987 pairs nested in 2004 (FWS, 2005a). Recent predation on Pelican Island resulted in no observed 2005 breeding pairs, which has possibly led displaced breeding pairs to use Shamrock Island with 340 pairs, and Sunfish Island with 30 pairs, both islands which are located in Corpus Christi Bay. Further to the south, 100 breeding pairs were observed on a Laguna Vista island in 2004 (FWS, 2005a).

2.3.5 Presence in the Project Area

In Texas, the brown pelican occurs from Chambers County to Cameron County (Campbell, 1995), primarily along the lower and middle coasts. Occasional sightings are reported on the upper coast and inland to central, north-central, and eastern Texas (Texas Ornithological Society (TOS), 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. The Padre Island National Seashore (PAIS) checklist of birds lists the brown pelican as an uncommon from March through November and rare in winter and is more common on the Gulf side of Padre Island than in the Laguna Madre (Southwest Parks and Monuments Association (SPMA), 1990). Brown pelicans are likely to occur in the project area and immediate vicinity as post-breeding visitors or migrants.

2.3.6 Effects of the Project

This species is expected to forage in the project area or general vicinity on occasion, and it could potentially be temporarily affected from noise and activity from the proposed project. Because the nearest active nesting colony is at Shamrock Island, approximately 7.0 miles southwest of the proposed project at it closest point, nesting pelicans will not be impacted by the project. Direct impacts to loafing and feeding birds may result from beach maintenance vehicles and activities. Beach maintenance activities may disturb brown pelicans causing them to take flight and relocate to other feeding and loafing areas. This displacement will be temporary since birds disturbed by traffic or human activities generally move a short distance away and continue to perform their pre-disturbance behavior. No significant impacts to this species are anticipated as a result of this project.

2.3.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the status and habitats of this species. Because only temporary potential effects to the brown pelican may occur as a result of the proposed project, no additional conservation measures are identified.

2.3.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the brown pelican.

2.4 PIPING PLOVER

2.4.1 Reasons for Status

The piping plover *(Charadrius melodus)* was Federally listed as endangered on December 11, 1985, for the Great Lakes watershed and was listed as threatened throughout the remainder of its range (50 FR 50726). The rule became effective on January 10, 1986. In 1986, an estimated 2,100 to 2,300 breeding pairs occurred in North America: 1,337 to 1,409 pairs in the northern Great Plains, 19 to 24 pairs in the Great Lakes, and 799 pairs along the Atlantic coast (Haig et al., 1987). Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat due to commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and the draining of wetlands have further contributed to the decline of the species (FWS, 1995a). Additional threats include human disturbances through recreational use of habitat and predation of eggs by feral pets (FWS, 1995a).

2.4.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include: sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on emergent dredged material placement areas as well as natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. On the wintering grounds, these birds utilize beaches, mud flats, sand flats, dunes, and offshore spoil islands (AOU, 1998; FWS, 1995a). Much of the Laguna Madre in Mexico became less suitable as important wintering areas for this species when its water level was stabilized for a fisheries lagoon. In Texas, an estimated 30% of wintering habitat had been lost over a 20-year period (50 FR 50726; December 11, 1985). Critical habitat has been designated for this species in the project area as described below.

2.4.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario), and along the Atlantic coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf of Mexico coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 FR 50726, December 11, 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic coast (AOU, 1998). Little is known about the migration routes of this species.

2.4.4 Distribution in Texas

The piping plover begins arriving at its post-breeding and wintering grounds in Texas in mid to late July. Haig and Oring (1985, 1987) found that early in the post-breeding season, piping plovers frequented beaches, but later tended to inhabit ephemeral sand flats along the backside of barrier islands. Observations of wintering piping plovers in Alabama did not indicate a seasonal preference between habitats, although wintering plovers spent more than 85% of their time on sand flats or mud flats each month (Johnson and Baldassarre, 1988). Along the Texas coast, a correlation appears to exist between tidal height and habitat selection, with piping plovers actively feeding on tidal flats during periods of low tides, and on the Gulf beaches during high tides (Eubanks, 1991; Zonick, et al., 1998; Drake et al., 2000). Winter distribution studies along the Atlantic and Gulf coasts found piping plovers usually occurring in small, unevenly distributed groups along the coast; however, the sites with largest concentrations of plovers consisted of expansive sand flats or mud flats with sandy beach in close proximity (Nicholls and Baldassarre, 1990). Plovers on the wintering grounds suggest that they show some site fidelity, returning to the same stretch of beach year after year. On the lower Texas coast, individual plovers are known to use areas about 3,000 acres in size, moving 2 miles or more between foraging sites as tidal movements shift the availability of productive tidal flats (TPWD). Recent studies show significantly more stringent site fidelity with individual birds returning to more precise locations (+/-400 feet in lateral distance on the beach) each year (Amos, 2006). Piping plover concentrations in Texas occur in Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio and Willacy counties (FWS, 1988). FWS (1995a) estimates that approximately 1,900 piping plovers, or approximately 35%, wintered along the Texas Gulf coast.

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consist of coastal beach, sand flat and mud flat habitats.

Critical Habitat for the wintering grounds (as opposed to breeding population Critical Habitat) has recently been designated in Texas by the FWS (66 FR 36074—36078), some of which lies partially or entirely within the project area:

- TX-3 (subunit 4) – This subunit extends along the gulf shore of Padre Island from the northern boundary of Padre Island National Seashore at the shore, north to the Nueces-Kleberg county line.
- TX-8- Mustang Island Beach – This is a stretch of beach extending from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas, TX. The landward boundary is the beginning of dense vegetation, and the gulfward boundary is MLLW.

Other Critical Habitat areas are located either adjacent to or very near, but not within the project area. These areas will not be disturbed by beach maintenance activities. These include:

- TX-5 – Upper Laguna Madre – This unit includes a series of small flats along the bayside of Padre Island in the Upper Laguna Madre. The landward boundary is the beginning of dense vegetation and the waterward boundary is the MLLW in the Laguna Madre. It is bounded in the north by the Nueces/Kleberg County line and in the south by the northern boundary of Padre Island National Seashore (PAIS).
- TX-6 – Mollie Beattie Coastal Habitat – Subunit 1 is bounded in the north by Beach Access Road 3, on the east by the inland boundary of critical habitat Unit TX-7, on the south by Zahn Road, and on the west by Zahn Road. Subunit 2 is bounded on the north by Corpus Christi Pass, on the east by SH 361, on the south by the north side of Packery Channel, and on the west by the Gulf Intracoastal Waterway.
- TX-7 – Newport Pass/Corpus Christi Pass Beach – This unit is along a stretch of Gulf beach 5.3 miles long. It is bounded on the north by Fish Pass, on the east by MLLW, on the south by St. Bartholomew Avenue, and on the west by a line marking the beginning of dense vegetation.
- TX-9 – Fish Pass Lagoons – This unit encompasses flats facing Corpus Christi Bay that extend 0.6 mile on either side of Fish Pass. The inland boundary is the line indicating beginnings of dense vegetation, and the bayside boundary is MLLW.
- TX-10 – Shamrock Island and Adjacent Mustang Island Flats – This unit encompasses Shamrock Island, an unnamed small sand flat to the north of Wilson's Cut, and a lagoon complex that extends 2.2 miles to the southwest of Wilson's Cut. Critical habitat includes land to the line marking the beginning of dense vegetation down to MLLW.

On 26 July 2006, the United States District Court, Victoria County, Texas handed down a ruling in regards to a court case between the GLO and USFWS, which vacated the critical habitat rule adopted by the Service on July 10, 2001, (66 FR 36038) for 19 of the 37 Texas Critical Habitat units designated for the Wintering Piping Plover. This ruling remanded the service to conduct new rulemaking in accordance with all applicable federal laws. All of the above referenced areas, with the exception of TX-5 and TX-6 (located outside the immediate project area), were included in this ruling. As of the writing of this biological assessment, the USFWS is still re-evaluating these areas and reclassification of those units affected by this ruling has not been completed.

2.4.5 Presence in the Project Area

The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser 1974; Haig and Oring, 1985, 1987; Haig and Plissner, 1993; TOS, 1995) and wintering birds have been reported along the length of the Texas coast. The PAIS checklist of birds lists the piping plover as a common winter resident but as an uncommon summer inhabitant of Gulf and bay environs within the seashore (SPMA, 1990).

During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW, 1996). The proposed project area was included in that survey.

Piping plover may occur throughout the project area, though with varying numbers and concentrations depending on annual fluctuations of the regional climate and time of year. Portions of two former critical habitat areas, TX-3 (subunit 4) and TX-8, are located on Gulf of Mexico beaches within the project area and both contain a similar wide, sandy beach habitat type.

2.4.6 Effects of the Project

The effects of the proposed beach maintenance activities on the piping plover are expected to be minimal. In studies along the Laguna Madre, Drake et al. (2000) found that overall usage of relatively undisturbed beach habitats by wintering piping plovers, including both foraging and roosting activities, was minimal (2.8%). Piping plovers were found primarily to use beach habitats when other preferred habitats were unavailable, such as when algal and sand flats were inundated. This is considered to be partly due to the prime availability of forage species on tidal flats but also possibly due to the high level of disturbance on beach habitats (Drake et al., 2000). The entire beach area included in the permit application currently receives considerable use by recreational beach visitors. This high use does result in disturbance to piping plovers. Mechanized cleaning of the beaches will also result in some additional disturbance to individual birds using the beach; however, unlike the beach use by the public, beach maintenance activities tend to occur in only small segments of the beach at any one time and thus are likely to pose only a minor and temporary disturbance to resting and foraging birds when compared to general recreational use of the beach in general. Further, periodic cleaning of the beaches will result in the removal of large quantities of debris and sargassum, which, if not removed, result in the coverage of large expanses of the open beach. Removal of these items will actually expose more of the beach for use by foraging piping plovers.

The effects of beach maintenance activities on piping plover habitat with respect to erosional impacts on habitat area are expected to be minimal. Erosion rates are increasing along most of the Texas coast; the proposed beach maintenance activities are not expected to have an appreciable influence on local erosion rates.

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island (a beach which is described as having a history of beach maintenance activity) than on St. Joseph Island, a beach that is not cleaned. In addition, this same study suggests a general increase of total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels than in years where the sargassum levels are considerably higher. These observations tend to show a positive effect on the piping plover where the beaches are more open with less occurrence of sargassum accumulation.

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island, which has a history of beach maintenance activity, than on St. Joseph Island, a beach that is not cleared. In addition, the same study suggests a general increase in total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels.

In summary, the proposed project is unlikely to result in any appreciable change in available critical habitat for the piping plover. Sargassum clearing activities may remove structure that plovers use for protection from the elements, but beach clearing is at a minimum during winter months when the birds are most likely to need protection from the elements. Further, sargassum removal may actually free up open beach foraging areas on a temporary basis. There will be no impact to plover nesting, as it does not occur in Texas. Wintering plovers that currently use the project area are already subjected to regular, and in some cases more prolonged, displacement by the public's recreational use of the beaches. Direct impacts to piping plovers from beach maintenance activities are most likely to occur during the spring and summer months when increased use of the beaches by the public necessitates intensified maintenance activities. Maintenance activities are at a minimum during winter months when plovers are more likely to be found in the proposed project areas. Most beach clearing activities are performed above the "wet beach" area and are thus above the portion of the beach most frequently used for foraging by plovers. Beach maintenance activities may temporarily displace plovers causing them to take flight, but displaced birds can easily relocate to adjacent habitat, as beach maintenance operations will be limited to only a fraction of the total project area at any given time. In fact, HDR/Shiner Moseley biologists have observed displaced birds relocating to other habitats, many of which are a short distance (less than 150 feet) from the area of disturbance. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements. In addition, periodic removal of considerable amounts of debris and sargassum will actually uncover more of the beach and thus allow for more of the beach to be used as foraging area.

2.4.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species. To accomplish this, the City will arrange a yearly training course with either PAIS or the University of Texas Marine Science Institute (UTMSI). The scope of the training will include: 1) Identification of piping plovers; 2) Recognition of plover habitat; 3) Basic procedures for recording piping plover information; 4) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with piping plover training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken in order to allow the City to conduct beach maintenance activities as authorized by the USACE permit, to monitor the effects of beach maintenance activities on piping plovers and their habitat, and to make determinations about potential adjustments to beach maintenance activities in an adaptive fashion on an as-needed basis (See Attachment 2). Parameters to be assessed are beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities. Results of the habitat monitoring effort will be provided in an annual report to USACE by February 1 of each year for a period of 5 years.

2.4.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the piping plover.

2.5 SLENDER RUSH PEA

2.5.1 Reasons for Status

The slender rush pea *(Hoffmannseggia tenella)* was first proposed as an endangered species on November 21, 1984 and became listed as endangered on November 1, 1985 (50 FR 45614, 45618). The reasons for decline (comments published in the Federal Register, 50 FR 45614, February 25, 1986) identified the loss due to conversion of Gulf Coastal Prairies to agriculture and competition from nonnative grasses (primarily King Ranch bluestem and Bermuda grass) that have been introduced for soil stabilization and pasture improvement. Limited distribution and low population numbers make this species vulnerable to any further disturbance.

2.5.2 Habitat

Slender rush pea grows on calcareous, clayey soils in prairies and creek bands associated with short and midgrasses such as buffalograss, Texas wintergrass (Stipa leucotricha), and Texas grama. Woody plants such as honey mesquite, huisache, huisachillo (Acacia tortuosa), granjeno, brasil (Condalia hookeri), retama, lotebush (Zizyphus obtusifolia), tasajillo (Opuntia leptocaulis), and prickly pear (Opuntia spp.) are also common at the known sites. No critical habitat has been designated for this species.

2.5.3 Range

The slender rush pea, known only to Texas, can be found along the South Texas Gulf coast counties of Kleberg and Nueces (TPWD, 1999c).

2.5.4 Distribution in Texas

The slender rush pea is known from only three or four populations in Kleberg and Nueces counties (TPDW, 1999c).

2.5.5 Presence in the Project Area

This species is unlikely to occur in the project area due to the lack of suitable soils and habitat.

2.5.6 Effects of the Project

No effects to the slender rush pea are anticipated as a result of this project.

2.5.7 Conservation Measures

Because no potential effects to the slender rush pea will occur as a result of the proposed project, no additional conservation measures are needed.

2.5.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the slender rush pea.

2.6 KEMP'S RIDLEY SEA TURTLE

2.6.1 Reasons for Status

Kemp's ridley *(Lepidochelys kempii)* was listed as endangered throughout its range on December 2, 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (FWS and NMFS, 1992; NMFS, 2000). The National Research Council's (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86% of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). It is estimated that before the implementation of Turtle Exclusion Devices (TEDs) the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NMFS, 2000). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and long lines.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54% (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, Styrofoam, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf of Mexico. Laws enacted during the late-1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products poses additional threats (Campbell, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). Dredging operations affect Kemp's ridley sea turtles through incidental take and by degrading the habitat. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through open bay placement of dredged material, degraded water quality/clarity, and altered current flow (FWS and NMFS, 1992).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results. Adult females also may avoid brightly lit areas that would otherwise provide suitable nesting sites (FWS, 1998). Also of concern are impacts to nesting sites due to vibration, sand compaction, sargassum piles, vehicular ruts and collisions with motor vehicles.

Today, under strict protection, the population appears to be in the early stages of recovery. Approximately 6,000 Kemp's ridley nests were recorded on Mexican beaches during the 2000 nesting season (Shaver, 2000). In 2001, 5,369 Kemp's ridley nests were recorded in Mexico, while in 2002 the number of nests rose to 6,326. As of mid-August 2003, 8,100 nests have been recorded in Mexico (Peña, 2003). More recent counts include approximately 10,000 nests in 2005, 12,000 in 2006, and 15,000 nests in 2007 (Shaver, personal correspondence, 2007). In addition, nesting on Texas beaches also continues to increase with the 2008 count, totaling 195 confirmed nests (Shaver, 2008b). The increase likely can be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use TEDs in shrimp trawlers both in the U.S. and in Mexico (NMFS, 2000).

2.6.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, although rarely in bays, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on sargassum and associated infauna, and other epipelagic species of the Gulf of Mexico (FWS and NMFS, 1992). In some regions the blue crab *(Callinectes sapidus)* is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Shaver, 1991; Campbell, 1995).

2.6.3 Range

Adults are primarily restricted to the Gulf of Mexico, although juveniles may range throughout the Atlantic Ocean since they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

The majority of Kemp's ridleys nest on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, approximately 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz. Nesting has been documented from approximately 134 miles of the Tamaulipas coastline, and sporadic nesting has been reported from Bolivar Peninsula, Texas, southward to Isla Aquada, Campeche. There have been several isolated nesting attempts scattered from North Carolina to Colombia.

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched Rancho Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas (mainly) or Florida waters (Caillouet et al., 1993). This program has shown some results. The first nesting from one of these head started individuals occurred at Padre Island in 1996 and more nestings have occurred since (Shaver, 2000). A continuing program is still ongoing. Eggs from sea turtle nests found at Padre Island National Seashore and northward along the Texas coast are transported to the National Seashore's sea turtle incubation facility for protected care and monitoring. The hatchlings from the eggs are released at the northern end of Padre Island National Seashore when they emerge from their eggshells and become active (NPS, 2007).

2.6.4 Distribution in Texas

Kemp's ridley turtles occur in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. Additionally, there appear to be a population of Kemp's ridley turtles which remain in the northern gulf for longer periods of time. Females nesting on the Texas coast are remaining resident here offshore during the nesting season and to some extent later, according to turtles recently outfitted with radio receivers; one prior to 2006 and one in 2007 (Orms, 2008). Additionally, one of the males previously tracked in Mexican waters traveled to waters off the Texas coast. Studies also show that juvenile turtles use Texas areas extensively for foraging.

Kemp's ridley turtles have nested sporadically in Texas in the last 50 years and total number of nests has increased over the last decade. Nests were found near Yarborough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. From 1979 to 2008, 722 sea turtle nests were found on the Texas coast. Of the 722 nests, 649 were Kemp's ridley nests, 361 of which were found on PAIS (Shaver, 2008). In 1999, 16 confirmed Kemp's ridley nests were recorded in Texas, 12 nests were confirmed for 2000, 8 for 2001, 38 for 2002, 19 for 2003, 42 for 2004, 51 for 2005, and 102 for 2006 (PAIS data). For the 2008 nesting season, there have been a total of 195 confirmed nests. Several of the ridley nests were from head-started individuals. Such nestings, together with the proximity of the Rancho Nuevo breeding ground, probably accounts for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1986, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection. Kemp's ridleys have been observed mating in the Mansfield Channel and, thus, could potentially mate in the nearby Laguna Madre and Gulf of Mexico.

2.6.5 Presence in the Project Area

In south Texas, Kemp's ridley turtles have been recorded in Willacy County, as well as in Nueces, Kleberg, Kenedy and Cameron counties (Dixon, 2000). Thus, this species could potential occur in the project area. During the 2006 nesting season, a total of 102 Kemp's ridley nests were documented along the Texas coast (NPS 2006), 128 during the 2007 nesting season (NPS, 2007), and 195 during the 2008 nesting season (Shaver, 2008). Kemp's ridley turtles are the only species to have nested in the proposed project area over the last five years; nest totals for the proposed project area are as follows (Shaver, 2008):

Year	# Kemp's Ridley Nests
1997	1
1998	1
1999	2
2000	0
2001	1
2002	0
2003	0
2004	1
2005	1
2006	0
2007	3
2008	3

2.6.6 Effects of the Project

The following discussion will be referenced for all sea turtles included in this BA. Section 7 consultation with NMFS concluded in their concurrence that endangered and threatened turtles in the aquatic environment will not be affected by this project. Activities will generally be carried out above the MHT, rather than in the water, and will therefore not significantly affect any aquatic environment.

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be directly vulnerable to the heavy machinery associated with beach maintenance activities. In addition, those activities could interfere with and/or prevent some turtles from attempting to nest. Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann, 1977; NMFS and U.S. Fish and Wildlife Service, 1991a, 1991b, 1992, 1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it difficult to find possible nests for protection. Ruts from vehicles can trap hatchlings and smaller stranded turtles and may result in death (Hosier et al., 1981; Fletemeyer, 1996, Ernest et al., 1998). Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer, 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Data is not available on the degree that compaction, resulting from vehicle use on the beach, either prevents or reduces nesting success.

Vibrations and noise caused by moving vehicles on the beach during beach maintenance operations could frighten nesting turtles, causing them to abandon their nesting attempt (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Vibrations could also harm incubating eggs. It is difficult to assess this possible impact since scientific data is lacking for the Kemp's ridley turtles' sensitivity to traffic vibrations or noise. Vibrations could affect sea turtles either during nest site selection after exiting the water or once the eggs are laid. Vibrations could cause sea turtles to abandon a nesting attempt resulting in a false crawl and causing a sea turtle to re-enter the water and nest in another location. Information suggests that turtles do not respond to vibrations once egg-laying has begun.

Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Regular beach maintenance removes debris, including non-natural items (e.g. plastics, beach chairs, old buoys) and large natural objects (e.g. tree trunks and sargassum), both of which wash ashore in large quantities and both of which can impede or prevent turtle nesting. At times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to four feet in height and 10 to 20 feet in width. The removal of this material, as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier and by providing a smooth crawlway.

Beach maintenance has the potential to kill emerging hatchling turtles from in situ nests not previously discovered by patrols. The hatchlings may be caught in seaweed which will be scraped up and either mounded or buried. While this is a potential effect of the project, it is not possible to quantify the potential impacts that may result from beach maintenance programs. USFWS states that turtle mortalities may also result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.6.7 Conservation Measures

This project may potentially impact Kemp's ridley turtles if they are present in the project area during beach maintenance activities. However, conservation measures and monitoring of beach maintenance activities by trained City employees and volunteers affiliated with the University of Texas Marine Science Institute (UTMSI) will help decrease the likelihood of impacts.

The USACE intends to condition any permit issued to the City for this work to include provisions that require the City to do the following:

(1) Annual Sea Turtle Monitoring Plan

Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the Corps of engineers for approval. This plan shall contain information on how the City will ensure compliance with the conservation measures for sea turtles as defined in this section. In addition, an annual follow-up report will be presented to the Corps prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

The City will provide a financial award to any City beach maintenance employee who successfully identifies a turtle nest.

All turtles, turtle nests, or turtle eggs found by monitors or maintenance personnel will be safe-guarded by City staff until they can be relocated by appropriate authorities.

(2) Turtle Patrols
The City will ensure that daily patrols are carried out from 15 March to 1 October for the entire 7-mile stretch of beach within the project area, beginning at 6:30 am and ending at 6:30 pm. UTMSI will conduct volunteer turtle patrols daily from 15 March to 30 June, beginning around 6:30 am and concluding around 2:00 pm. The UTMSI patrols will extend from the south from the south jetty at Aransas Pass Inlet past the southern border of the City of Port Aransas (approximately 7 miles, including the entire proposed project area. Trained City staff will monitor this stretch of beach beginning at 2:00 pm, when the UTMSI volunteers conclude their patrols, and will continue until 6:30 pm. In the event that there is a lapse in volunteer coverage, the volunteer coordinator at UTMSI will notify City staff so that they may reassign personnel to cover for the absent volunteer.

(3) Training
The City will require all personnel involved in beach maintenance activities to receive training each year, prior to their involvement in cleaning activities. The scope of the training will include: 1) Identification of different turtle species; 2) Recognition of turtle tracks or crawls; 3) Basic procedures for recording turtle information if turtle returns to the water prior to the arrival of the turtle patrol team; 4) Protection of nest areas, 5) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

(4) Maintenance
No maintenance equipment shall enter a work area until an initial survey has been performed and they are notified by the monitor that it is clear to proceed. Initial surveys may be done by the monitor with the equipment prior to commencing work from 15 March to 30 March and again from 1 July to 30 September. Initial surveys from 1 April to 30 June should be completed by UTMSI as part of their annual volunteer turtle patrol activities.

If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the sighting location, and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence within 100 feet of the nest site until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. The City has stated that its staff will honor this commitment to cease maintenance activities within 100 feet of the nest site for a period no greater than 3 hours. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City has stated that its staff will flag the nest area and recommence work, making sure that the nest site is avoided.

All ruts and berms created by City equipment engaged in beach maintenance activities will be smoothed out to a target height of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment in use so that turtle tracks can be better identified and to prevent small turtles from becoming entrapped. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

Mechanical beach cleaning equipment shall attempt to limit penetration into the surface of the beach to depths of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment..

USACE will require the City to have a trained City-staff monitor or supervisor on-site when beach maintenance equipment is being used during the peak turtle nesting season from 15 March – 30 July.

The City will implement a monitoring plan requested by the USACE and coordinated with the Service.

If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredune.

The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m. If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (60.9 meters) to allow turtles to traverse these areas.

During beach maintenance activities, equipment will be driven above the "wet line" on the beach to more easily identify sea turtle tracks and minimize disturbance of birds.

The City will be allowed to build an approximately 20-foot wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be preset in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where berms are in place, they will attempt to create an unrestricted passage for the turtle by smoothing out the berm with a shovel or tool. As specified in other sections of this document, the proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest. The piles of sand, and the sculptures made from them, will be spaced so as to allow ample open beach for use by any nesting turtles. The sculptures and mounded sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

5) Education
The city will ensure that public education signs are posted at strategic locations in the project area. Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at PAIS. These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle sighting occurs.

(6) Notification
In the event a take occurs, the City will immediately notify both the USACE, Corpus Christi Regulatory Office and the US Fish & Wildlife Service Corpus Christi Field Office. From the time that a take occurs until 15 July of that calendar year the City will be required to have a monitor present with each work crew, while machinery is in operation.

(7) Annual Sea Turtle Report
A Sea Turtle Annual Report will be provided to the USACE by 1 February of each year. This report will include:

1. Summary of the number of turtles and turtle nests found that year by species
2. Map depicting the location of each nest
3. Number of takes, if any, by species
4. Summary of measures implemented during the project activities, relative success of those measures, and any recommendations for improving those measures

2.6.8 Conclusion

Despite an increase in nesting turtles within the project area, the risk to a Kemp's ridley sea turtle within the project area is still considered limited and will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. However, despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.7 HAWKSBILL SEA TURTLE

2.7.1 Reasons for Status

The hawksbill sea turtle *(Eretmochelys imbricata)* was Federally listed as endangered on June 2, 1970 (35 FR 8495), with critical habitat designated in Puerto Rico on May 24, 1978 (43 FR 22224). The greatest threat to this species is harvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices (recently $225/kilogram (kg)). Japanese imports of raw hawksbill shell (bekko) between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles. The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2000).

2.7.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they are typically found at depths of less than 70 feet. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter coastal waters when they reach a carapace length of approximately 8 to 10 inches. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2000).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish, fish, and plant material such as algae, submerged aquatic vegetation (SAV) and mangroves, which also have been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than the adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. They nest on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, these sand beaches are low energy with woody vegetation, such as sea grape *(Coccoloba uvifera),* near the waterline (NRC, 1990). The hawksbill is typically a solitary nester, which makes it harder to monitor nesting activity and success (NMFS, 2000).

2.7.3 Range

The hawksbill is circum-tropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas), south to Brazil (NMFS, 2000). In the continental U.S., the hawksbill nests only in Florida where it is sporadic at best (NFWL, 1980). However, a major nesting beach exists on Mona Island, Puerto Rico. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.7.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve post-hatchlings and juveniles, and sightings are primarily associated with stone jetties. Some are found washed ashore on south Texas Gulf beaches entangled in onion sacks or in association with large amounts of sargassum (Shaver, 2008). These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2000).

2.7.5 Presence in the Project Area

The hawksbill has been recorded from Nueces, Kleberg, Willacy, and Cameron counties (Dixon, 2000). Although unlikely, it is of potential occurrence in the project area. On June 13, 1998 the first hawksbill nest recorded on the Texas coast was found outside the project area at Padre Island National Seashore (Shaver, 1998). It contained 140 eggs of which 133 hatched and 132 were released into the Gulf (one weak hatchling was taken to a rehabilitation facility). This nest remains the only example documented on the Texas coast.

2.7.6 Effects of the Project

Because most of the sightings of the hawksbill sea turtle in the northern Gulf of Mexico occur at stone jetties, this species could occur near the stone jetty at Aransas Pass Inlet, just north of the project area. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.7.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.7.8 Conclusion

For the reasons cited in Section 2.7.6, the risk to a hawksbill sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the hawksbill sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the hawksbill sea turtle.

2.8 LEATHERBACK SEA TURTLE

2.8.1 Reasons for Status

The leatherback turtle *(Dermochelys coriacea)* was listed as endangered throughout its range on June 2, 1970 (35 FR 8495), with critical habitat designated in the U.S. Virgin Islands on September 26, 1978 and March 23, 1979 (43 FR 43688—43689 and 44 FR 17710—17712, respectively). Its decline is attributable to overexploitation by man and incidental mortality associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles have also been mentioned as causes for mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). Although nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change nesting beaches, current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide. The major threat is egg collecting, although they are also jeopardized to some extent by destruction or degradation of nesting habitat (NatureServe, 2000). Egg collecting is not currently a problem in Florida, but remains a problem in Puerto Rico and the U.S. Virgin Islands (NMFS and FWS, 1992). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped with turtle excluder devices (TEDs) because adult leatherbacks are too large to pass through the TED exit opening. While the TED exit opening size has been increased in the U.S., USFWS is unsure whether it has been increased in other countries. Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and FWS, 1992).

2.8.2 Habitat

The leatherback turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). It is most often found in coastal waters when nesting or following concentrations of jellyfish (TPWD, 2000), during which it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths.

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed (NFWL, 1980). The leatherback typically nests on beaches with a deepwater approach (Pritchard, 1971). No critical habitat has been designated within the project area.

2.8.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It is found in the Atlantic, Pacific and Indian oceans and occurs as far north as British Columbia, Newfoundland, Great Britain and Norway, as far south as Australia, Cape of Good Hope, and Argentina, and in other water bodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions and major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the

Atlantic and Gulf states of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2000).

The leatherback migrates further and ventures further into colder water than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 3,666 miles to Ghana, West Africa, after nesting in Surinam (NMFS and FWS, 1992). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.8.4 Distribution in Texas

According to FWS (1981), leatherbacks have never been common in Texas waters. Leatherback turtles tend to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf of Mexico, the leatherback is often associated with two species of jellyfish, the cabbagehead (*Stomolophus* sp.) and the moon jellyfish (*Aurelia* sp.) (NMFS and FWS, 1992). Leatherback turtle feeding aggregations—large occurrences of 100 turtles—were reported by Leary (1957) off Port Aransas in December 1956 and in the Brownsville Eddy in winter (Hildebrand, 1983). A leatherback turtle nest was found at Padre Island National Seashore on June 6, 2008; however, none of the eggs hatched (Shaver, 2008). Prior to this, no nests of this species have been recorded on Texas beaches for over 60 years. The last two reported, one from the late 1920s and one from the mid-1930s, were both from Padre Island (Hildebrand, 1982, 1986). Stranding records report 1 leatherback on the Texas coast in 2006 and 1 in 2007 (Orms, 2007).

2.8.5 Presence in the Project Area

The leatherback has been recorded from Nueces, Kenedy, and Cameron counties (Dixon, 2000). Although highly unlikely, the potential exists for this species to occur in the project area.

2.8.6 Effects of the Project

Of the five species of sea turtles occurring in Texas waters, the leatherback is the species least likely to be affected by the proposed project because of its rare occurrence on Texas beaches and its pelagic nature. No effects to this species are anticipated as a result of the project.

2.8.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.8.8 Conclusion

For the reasons cited in Section 2.8.6, the risk to a leatherback sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the leatherback sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the leatherback sea turtle.

2.9 GREEN SEA TURTLE

2.9.1 Reasons for Status

The green sea turtle *(Chelonia mydas)* was listed on July 28, 1978 as threatened except for Florida and the Pacific coast of Mexico (including the Gulf of California), where it was listed as endangered (43 FR 32808). The greatest cause of decline in green sea turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch during commercial shrimp trawling is a continued source of mortality that adversely affects recovery. It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green sea turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and subadults. Various other fishing operations also negatively impact this species (NMFS, 2000). Epidemic outbreaks of fibropapilloma or "tumor" infections recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). Some scientists suspect this disease to be linked to environmental alteration of sea turtle habitat by pollution and contaminants (FWS, 1998). This species is also subject to various negative impacts shared by sea turtles in general. According to Donna Shaver, an additional significant threat to the green sea turtle's survival is hypothermic stunning (Orms, 2008).

2.9.2 Habitat

The green sea turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and submerged aquatic vegetation (SAV). Individuals observed in the open ocean are believed to be migrants en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. Adults are primarily herbivorous, while juveniles consume more invertebrates. Principal food items include SAV, macroalgae and other marine plants, mollusks, sponges, crustaceans, and jellyfish (Mortimer, 1982; Green, unpubl. data).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galapagos Islands, green sea turtles have been observed basking on beaches (Balazs, 1980; Green, unpubl. data). They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994), although an individual might switch to a different nesting beach within a single nesting season (Green, unpubl. data).

2.9.3 Range

The green sea turtle is a circum-global species in tropical and sub-tropical waters. In U.S. Atlantic waters, it is found around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Ayes Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and FWS, 1991b; Hirth, 1997). Nesting numbers are increasing rapidly in Florida and Mexico (Orms, 2008).

2.9.4 Distribution in Texas

The green sea turtle in Texas inhabits shallow bays, rock passes, and estuaries where its principal foods, the various marine grasses and other SAV, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid to late nineteenth century, Texas waters supported a green sea turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the Lower Laguna Madre, although a few also came from Galveston Bay. They have also been documented in large numbers at Packery, Mansfield and Brazos Santiago Pass and observed at Fish Pass and at the Port Aransas Jetties (Orms, 2008). Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, with the last Texas turtler hanging up his nets in 1935. Incidental catches by fisherman and shrimpers were sometimes marked prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Reduced numbers of green sea turtles can still be found in these same bays today (Hildebrand, 1982). Although numbers of green turtles are much reduced over historic figures, their numbers are now starting to increase. While green sea turtles prefer to inhabit bays with SAV meadows, they may also be found in bays that are devoid of SAV. The green sea turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Juvenile green turtles are being reported in increasing numbers from surf waters of the Gulf of Mexico. Increasing numbers are also being found washed ashore on south Texas Gulf beaches in association with large amounts of sargassum (Shaver, 2008).

Green sea turtle nests are rare in Texas. Of the 722 turtle nests found on the Texas coast between 1979 and 2008, 26 were green sea turtle nests, all of which were found outside the project area on PAIS and one on South Padre Island. This includes five in 2008 outside the project area including four within PAIS and one on South Padre Island (Shaver, 2008). Three nests were found in 2007, two within PAIS and one on South Padre Island. Also included (all at PAIS) are two in 2006, 4 in 2005, 1 in 2004, 2 in 2003, 2 in 2002, and 1 in 2000. Observed juveniles are likely from Mexico and may return there to nest. There is a possibility that increased nesting of these juveniles in Texas could occur (Orms, 2008).

2.9.5 Presence in the Project Area

The green sea turtle has been recorded from Nueces, Kleberg, Kenedy, Willacy and Cameron counties (Dixon, 2000). There is potential for this species to occur in the project area, but individuals are most likely to be in transit through Aransas Pass Inlet en route to the back bays west of the project area. In Texas (Shaver, 2000, unpublished data), green sea turtle nests have only been documented at PAIS, south of the project area.

2.9.6 Effects of the Project

Because most of the sightings of the green sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the proposed project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities may impact nesting green sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.9.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.9.8 Conclusion

For the reasons cited in Section 2.9.7, the risk to green sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.10 LOGGERHEAD SEA TURTLE

2.10.1 Reasons for Status

The loggerhead sea turtle *(Caretta caretta)* was listed as threatened throughout its range on July 28, 1978 (43 FR 32808). The decline of the loggerhead, like that of most sea turtles, can be attributed to overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predatation. The most significant threats to its population are coastal development, commercial fisheries, and pollution (NMFS, 2000).

2.10.2 Habitat

The loggerhead is found in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers. It favors warm temperate and sub-tropical regions not far from shorelines. The adults occupy various habitats, from turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching, and often float in masses of sargassum. They may remain associated with sargassum for 3 to 5 years (NMFS and FWS, 1991b).

Commensurate with their use of varied habitats, loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conch, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Rebel, 1974; Hughes, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

Nesting occurs usually on open, sandy beaches above high-tide mark and seaward of well developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and sub-tropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995). No critical habitat has been designated for this species.

2.10.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf coast. In recent years, a few have nested on barrier islands along the Texas coast.

2.10.4 Distribution in Texas

The loggerhead is considered to be the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It is also the species most commonly sighted around offshore oil rig platforms and reefs and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when one of their food items, the Portuguese man-of-war, is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths are due to the activities of shrimp trawlers where turtles are accidentally caught in the nets and drown and their bodies dumped overboard. Prior to 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, five were confirmed in 2000, three in 2001, one in 2002, two in 2006, 5 in 2007, and 3 in 2008 (Shaver, 2000, 2002, 2007, 2008). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were marketed (Hildebrand, 1982). Today, even with protection, insufficient loggerheads exist to support a fishery.

2.10.5 Presence in the Project Area

The loggerhead has been recorded in Nueces County and in Kleberg County (Dixon, 2000) and in Corpus Christi Bay (Shaver, 2000). There is potential for this species to occur in the project area. Of the 722 sea turtle nests found on the Texas coast between 1979 and July 2008, 46 were loggerhead sea turtle nests, of which 33 were found on PAIS. During the last decade, nesting has remained stable on the Texas coast at 1-5 nests per year, the majority of which occur on the Padre Island National Seashore, south of the project area.

2.10.6 Effects of the Project

Because most of the sightings of the loggerhead sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities could impact nesting loggerheads sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.10.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.10.8 Conclusion

For the reasons cited in Section 2.10.6, the risk to loggerhead sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.11 SOUTH TEXAS AMBROSIA

2.11.1 Reasons for Status

The South Texas Ambrosia became listed as endangered on September 23, 1994 (50 CFR Part 17). Loss of habitat has led to the decline of this species. Conversion of habitat to agricultural fields and urban areas has limited the amount of habitat available for colonization. In addition, introduced species such as buffelgrass *(Cenchrus ciliaris)* and King Ranch bluestem *(Bothriochloa ischaemum var. songaricus)* compete with this and other natives of the coastal prairie. Invasion of prairie by shrub and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. Disturbance associated with activities occurring along road right-of-ways where the species is found may also be detrimental.

2.11.2 Habitat

South Texas ambrosia grows and blooms at low elevations in open clay-loam prairies and savannas among *Ayenia limitaris*, *Buchloe dactyloides*, *Stipa leucotricha* and *Bouteloua rigidiseta*. South Texas ambrosia was first collected in San Fernando, Tamaulipas, Mexico, by Luis Berlandier in 1835. The first U.S. collection was made by Robert Runyon in 1932 in Cameron County, Texas. It has since been found in Cameron, Jim Wells, Kleberg and Nueces Counties in South Texas. Six populations are known to exist in Nueces and Kleberg counties. No critical habitat has been designated for this species.

2.11.3 Range

South Texas ambrosia is known only from the southern tip of Texas and from Tamaulipas, Mexico (Correll and Johnston, 1970; Turner, 1983). It was first collected by J.L. Berlandier in San Fernando, Tamaulipas, Mexico in 1835 (Turner, 1983), but it was not until 1859 that Gray described this species as new to science. Historically, South Texas ambrosia was known only from Kleberg, Nueces, Jim Wells, and Cameron counties in the Gulf Prairie region of Texas and Tamaulipas in Mexico. The status of the Mexican populations is unknown.

2.11.4 Distribution in Texas

This species has been historically reported from Jim Wells and Cameron counties, although it is currently verified in six general locations in Nueces and Kleberg counties (TPWD, 1999a).

2.11.5 Presence in the Project Area

The South Texas Ambrosia is limited to coastal prairies with clayey soil and therefore would not be found in the project area, which is located totally on a sandy beach.

2.11.6 Effects of the Project

No effects to the South Texas Ambrosia are anticipated as a result of this project.

2.11.7 Conservation Measures

Because no potential effects to the South Texas Ambrosia will occur as a result of the proposed project, no additional conservation measures are needed.

2.11.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the South Texas Ambrosia.

2.12 WEST INDIAN MANATEE

2.12.1 Reasons for Status

The West Indian manatee *(Trichechus manatus)* was listed as endangered on June 2, 1970 (35 FR 8495). The largest known human-related cause of manatee mortality in Florida is collisions with hulls and/or propellers of boats and ships. The second-largest human-related cause of mortality in Florida is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (FWS, 1993). Hunting and fishing pressures were responsible for much of its original decline, as manatees were heavily hunted for meat, hides, and bones until they were nearly extirpated (FWS, 1995a).

A prominent cause of natural mortality in some years in Florida is cold stress. Major die-offs associated with the outbreaks of red tide have occurred, where manatees appear to have died due to ingestion of filter-feeding tunicates (incidentally ingested by manatees feeding on seagrasses) that had accumulated the neurotoxin-producing dynoflagellates responsible for causing the red tide (FWS, 1993; 1995b). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

2.12.2 Habitat

The manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range it appears to prefer rivers and estuaries to marine habitats, although manatees inhabit marine habitats in the Greater Antilles (Lefebvre et al., 1989). It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 20°C. In the northern portions of their range during October through April they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power plants. They prefer waters that are at least 3.3 to 6.6 feet in depth; along coasts they are often in water 9.9 to 16.5 feet deep. They usually avoid areas with strong currents (NatureServe, 2000).

Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability. They may opportunistically eat other foods such as acorns in early winter in Florida or fish caught in gill nets in Jamaica (O'Shea and Ludlow, 1992).

2.12.3 Range

The manatee ranges from the southeastern U.S. and coastal regions of the Gulf of Mexico, through the West Indies and Caribbean, to northern South America. United States populations occur primarily in Florida (NatureServe, 2000), where they are effectively isolated from other populations by the cooler waters of the northern Gulf of Mexico and the deeper waters of the Straits of Florida (Domning and Hayek, 1986).

2.12.4 Distribution in Texas

Manatees are extremely rare in Texas, although in the late 1800s they apparently were not uncommon in the Laguna Madre. Recent Texas records also include specimens from Cameron, Willacy, Galveston, and Matagorda counties (FWS, 1995a); Davis and Schmidly (1994) describe a Texas record of a manatee found dead in the surf near Bolivar Peninsula near Galveston in 1986. Manatees may travel great distances (200 km or more) along the coast or between islands (FWS, 1995a). In the Corpus Christi Bay area, a manatee was sighted at Fish Pass on October 2, 1979 and another near the Naval Air Station in October and November 1995 (Price-May, 2002). Albert Oswald of the Texas State Aquarium spotted a manatee in the inlet between the Texas State Aquarium and the Lexington Museum on September 23, 2001. This is the third and probably most reliable sighting of the manatee in Corpus Christi Bay (Beaver, 2001). More recently in 2005, a manatee was spotted throughout the month of May in the Port Mansfield Harbor (KGBT Channel 4, 2005) and April 2006 (Wilson, 2006).

2.12.5 Presence in the Project Area

The manatee has been spotted in the Corpus Christi Bay area, and though highly unlikely, may access waters adjacent to the project area by way of Aransas Pass Inlet.

2.12.6 Effects of the Project

While the West Indian manatee has been recently sighted in back bay habitats to the southwest of the project area, such occurrences are extremely rare, and the likelihood that any individuals would end up in the waters adjacent to proposed project area is extremely unlikely. Regardless, the proposed activities will not affect aquatic habitats and thus have no potential to affect the West Indian manatee.

2.12.7 Conservation Measures

Because no potential effects to the West Indian manatee are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.12.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the West Indian manatee.

2.13 WHOOPING CRANE

2.13.1 Reasons for Status

The whooping crane *(Grus americanus)* was listed as endangered on March 11, 1967 (F.R. Doc. 67-2721). The whooping crane population, estimated at 500 to 700 individuals in 1870 declined to only 16 individuals in the migratory population by 1941 as a consequence of hunting and specimen collection, human disturbance, and conversion of the primary nesting habitat to hay, pastureland, and grain production. The main threat to whooping cranes in the wild is the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas coast. Collisions with power lines and fences are known hazards to wild whooping cranes. The primary threats to captive birds are disease and parasites. Bobcat predation has been the main cause of mortality in the Florida experimental population. (FWS, 2001).

2.13.2 Habitat

The nesting area in Wood Buffalo National Park is a poorly drained region interspersed with numerous potholes. Bulrush is the dominant emergent in the potholes used for nesting. On the wintering grounds at Aransas National Wildlife Refuge in Texas, whooping cranes use the salt marshes that are dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye. They also forage in the interior portions of the refuge, which are gently rolling, sandy, and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak, redbay, Bermuda grass, and bluestem. The non-migratory, Florida release site at Kissimmee Prairie includes flat, open palmetto prairie interspersed with shallow wetlands and lakes. The primary release site has shallow wetlands characterized by pickerel weed, nupher, and maiden cane. Other habitats include dry prairie and flatwoods with saw palmetto, various grasses, scattered slash pine, and scattered strands of cypress. Areas selected for the proposed eastern migratory experimental population closely mimic habitat of the naturally occurring wild population in Canada and Texas (FWS, 2001).

2.13.3 Range

Historic: The historic range of the whooping crane once extended from the Arctic coast south to central Mexico, and from Utah east to New Jersey, into South Carolina, Georgia, and Florida. The historic breeding range once extended across the north-central United States and in the Canadian provinces, Manitoba, Saskatchewan, and Alberta. A separate non-migratory breeding population occurred in southwestern Louisiana (FWS, 2001).

Aransas/Wood Buffalo Population: The current nesting range of the self-sustaining natural wild population is restricted to Wood Buffalo National Park in Saskatchewan, Canada and the current wintering grounds of this population are restricted to the Texas Gulf Coast at Aransas National Wildlife Refuge and vicinity. It is experiencing a gradual positive population trend overall, although some years exhibit stationary or negative results. In January, 2000, there were 187 individuals in the flock, including 51 nesting pairs (FWS, 2001).

An aerial whooping crane census was conducted March 4-5, 2008 at the Aransas National Wildlife Refuge and surrounding areas. The estimated size of the flock is listed at 266 birds, consisting of an estimated 144 adults, 83 subadults, and 39 juveniles. The total number of whooping cranes located on the census was actually 268, with presumably at least 3 cranes that moved and were counted twice. With the flight conducted on two consecutive afternoons, it is expected that a few cranes moved between portions of the census area and were counted on both days (Stehn, 2008).

Rocky Mountain Experiment: In 1975, an effort to establish a second, self-sustaining migratory flock was initiated by transferring wild whooping crane eggs from Wood Buffalo National Park to the nests of greater sandhill cranes at Grays Lake National Wildlife Refuge in Idaho. This Rocky Mountain population peaked at only 33 birds in 1985. The experiment terminated in 1989 because the birds were not pairing and the mortality rate was too high to establish a self-sustaining population. In 1997, the remaining birds in the population were designated as experimental, non-essential to allow for greater management flexibility and to begin pilot studies on developing future reintroduction methods. In 2001, there were only two remaining whooping cranes in this population (FWS, 2001), and in October 2007, the number was down to zero (Whooping Crane Eastern Partnership, Feb. 2008).

Captive Populations: As of October 2007, there were 148 captive whooping cranes held at eleven facilities (Whooping Crane Eastern Partnership, Feb. 2008). Four facilities: Patuxent Wildlife Research Center, International Crane Foundation, Calgary Zoo, and San Antonio Zoo are considered to have successful breeding programs. Chicks produced at the captive facilities either remain in captivity to maintain the health and genetic diversity of the captive flock, or are reared for release to the wild in the experimental reintroduction programs (FWS, 2001).

Florida Experimental Nonessential Population: An experimental reintroduction of whooping cranes in Florida was initiated in 1993 to establish a non-migratory population at Kissimmee Prairie. A non-migratory population avoids the hazards of migration, and by inhabiting a more geographically limited area than migratory cranes, individuals can more easily find compatible mates. From 1993 to 2001, 233 isolation-reared whooping cranes had been released in the area. In spring 2000, there were 65 individuals in the project area with 10 pairs defending territories and evidence of the first successful hatching of chicks (FWS, 2001). As of October 2007, this number is now 41 with 17 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

Eastern Migratory Population: A second experimental non-essential population is currently being reintroduced to eastern North America (FWS, 2001). The intent is to establish a migratory flock which would summer and breed in central Wisconsin, migrate across the seven states and winter in west-central Florida. The birds are taught the migration route after being conditioned to follow costumed pilots in ultralight aircraft. Initial experiments using sandhill cranes, completed in the Fall of 2000, successfully led 11 cranes 1,250 miles from Necedah National Wildlife Refuge in Wisconsin to Chassahowitzka National Wildlife Refuge in Florida. The birds winter in Florida and then migrate back to Wisconsin on their own in the spring.

Following this success, the first attempt to lead whooping cranes was made in 2001. Seven birds made it to Florida and the five that survived the winter returned to central Wisconsin the following spring. An additional 16 birds were successfully reintroduced to the flyway in 2002. In 2006, the total re-introduced population reached a high of 82 birds. In February 2007, 17 young birds of the 2006 hatching season were lost due to a severe storm at Chassahowitzka National Wildlife Refuge. There are currently attempts to establish a second wintering site at St. Marks National Wildlife Refuge, also on the Florida Gulf Coast, as a precaution against potentially similar circumstances in the future. As of spring 2008, it is expected that 76 cranes will migrate north as part of this eastern flock with 4 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

2.13.4 Distribution in Texas

The Aransas-Wood Buffalo population of cranes migrates southeasterly through Alberta, Saskatchewan and eastern Manitoba, stops-over in southern Saskatchewan, and continues through the Great Plains states of eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas (FWS, 2007). About 9,000 hectares of salt flats on Aransas National Wildlife Refuge and adjacent islands comprise the principal wintering grounds of the whooping crane. Marshes are dominated by salt grass (*Distichlis spicata*), saltwort (*Batis maritima*), smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia* sp.), and sea ox-eye (*Borrichia frutescens*). Inland margins of the flats are dominated by Gulf cordgrass (*Spartina spartinae*). Interior portions of the refuge are gently rolling and sandy and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak (*Quercus virginiana*), redbay (*Persea borbonia*), and bluestem (*Andropogon* spp.). In the last 30 years, many upland sites have been grazed, mowed, or burned under controlled conditions to maintain oak savannah habitat. The refuge maintains as many as 3,300 ha of grassland for cranes, waterfowl, and other wildlife. Human visitation is carefully controlled, and other potentially conflicting uses of the refuge, such as activities associated with oil and gas exploration, are reduced when whooping cranes are present (FWS, 2007).

2.13.5 Presence in the Project Area

The whooping crane has been recorded in Nueces County, and may potentially access waters on the bay side and interior of Mustang and Padre Islands outside the project area. There has never been a whooping crane sighting on a beach or dry dune system (Stehn, 2008).

2.13.6 Effects of the Project

While the whooping crane has been recently sighted in Nueces County, such occurrences are rare. Given its rarity and suitable habitat only in waters on the leeward side and interior of the barrier islands, combined with the fact that this project site is on a Gulf beach and not in a suitable habitat where this species frequents, this project will not affect the whooping crane.

2.13.7 Conservation Measures

Because no potential effects to the whooping crane are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.13.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the whooping crane.

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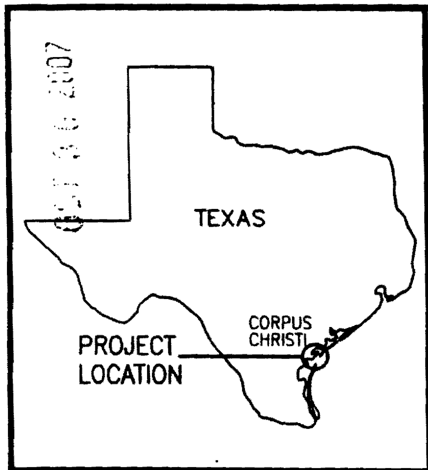
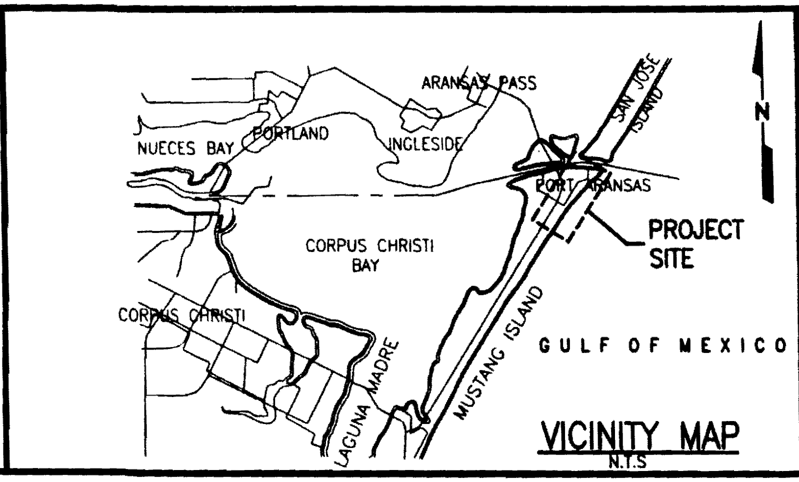
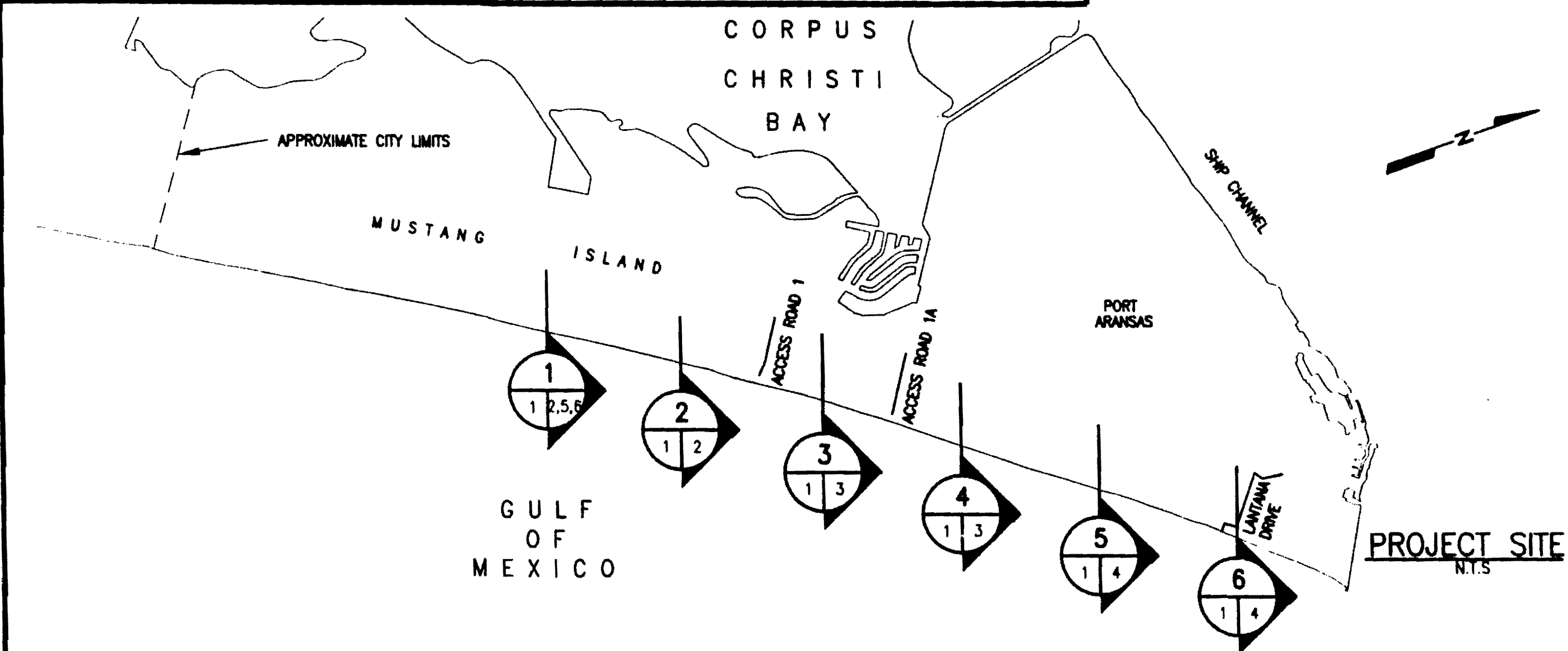
Attachment 1

Permit Application Drawings

PROJECT LOCATION







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Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
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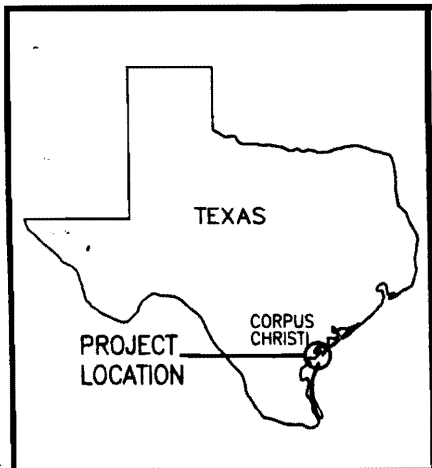
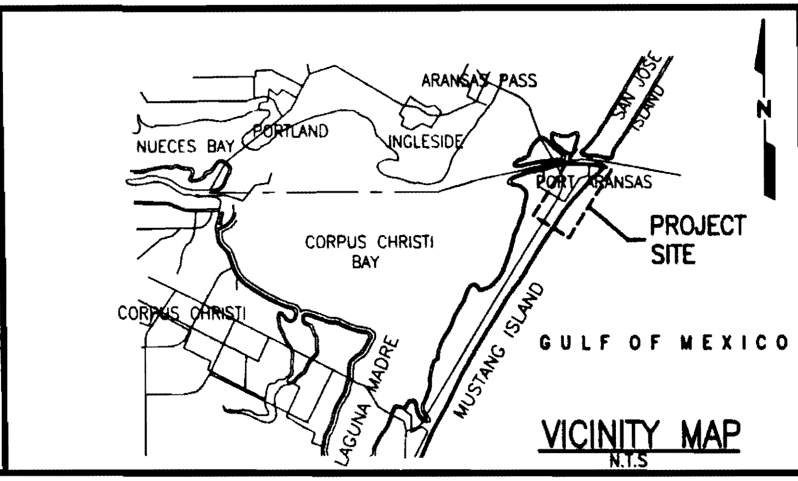
APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

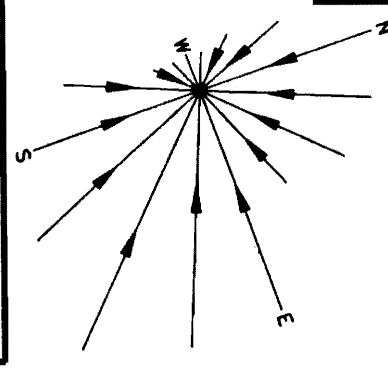
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

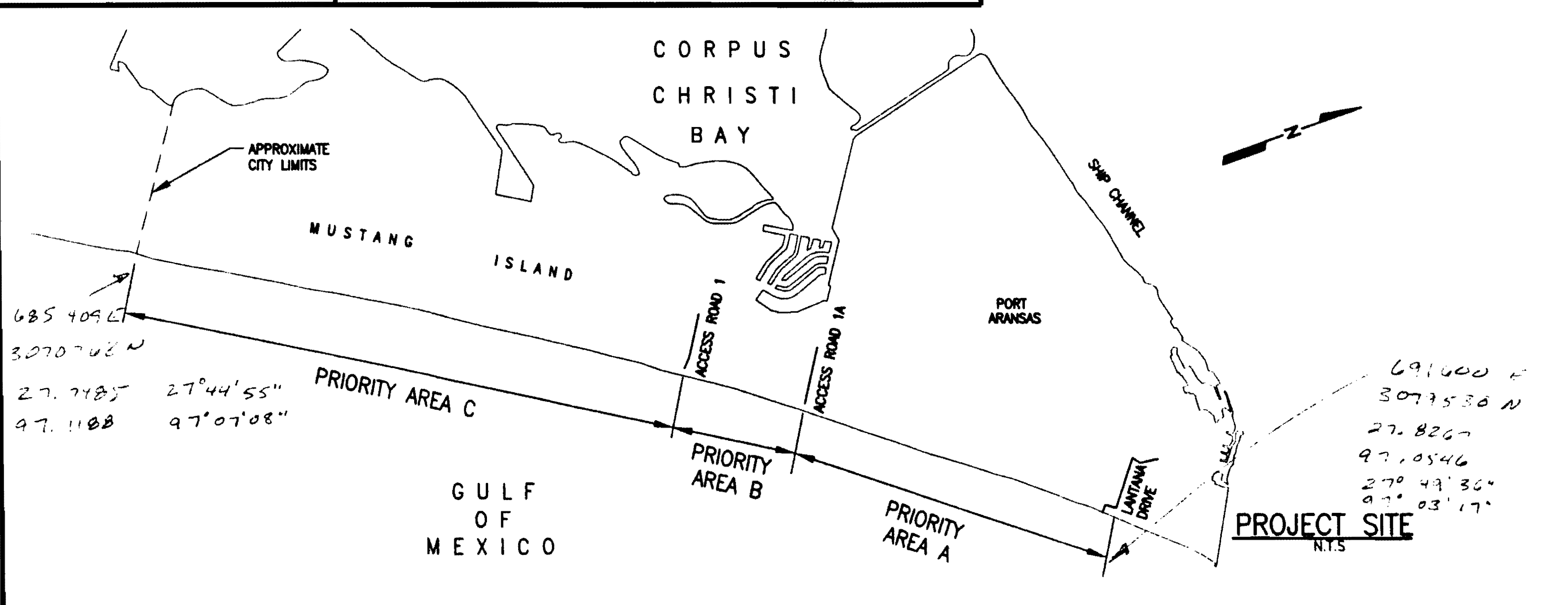
PROJECT No: 66107	SHEET 01 of 08





BEACH MAINTENANCE PRIORITY AREAS





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Permit Application No.: SWG-2007-1847	PROJECT NAME: GULF BEACH CLEANING
Applicant Name: City of Port Aransas	COUNTY: NUECES
Sheet 2 of 8	DATE: 08/07 · REV. DATE: 8-14-2007 · DATUM:

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555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

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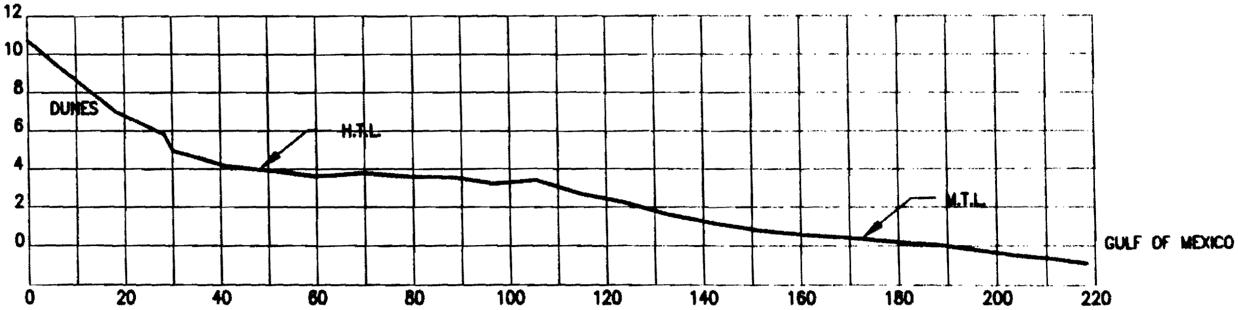
EXISTING CONDITIONS 1/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 1 IS LOOKING NORTH AT MIRAGE CONDOMINIUM.
4. SECTION 2 IS LOCATED AT MARKER 48 LOOKING NORTH.

OCT 3 0 2007



2 — 1 | 2 EXISTING CONDITIONS – SECTION

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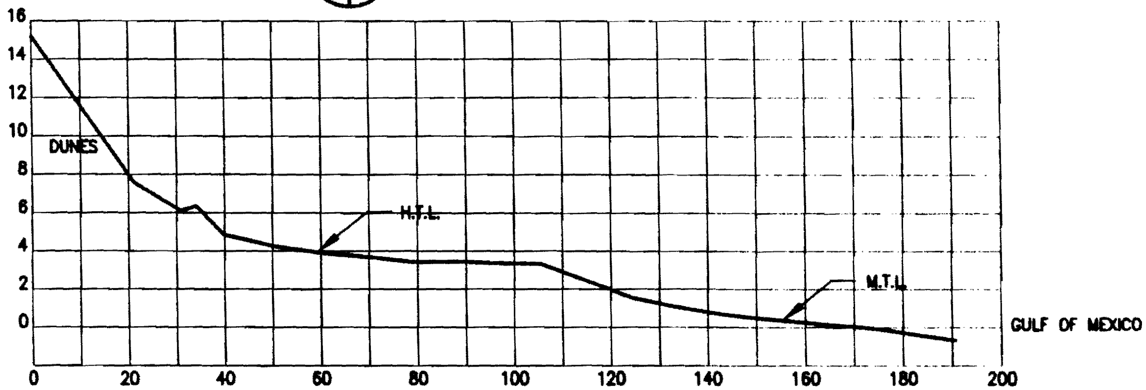

1 — 1 | 2,5,6 EXISTING CONDITIONS – SECTION

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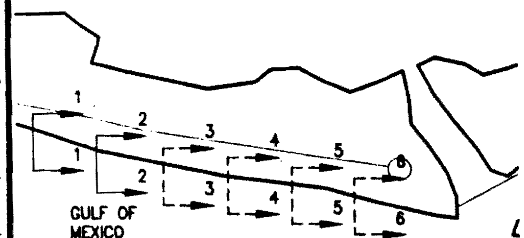

HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

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APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
DATE: 08/07	REV. DATE: 8-14-2007	DATUM: NAVD'88

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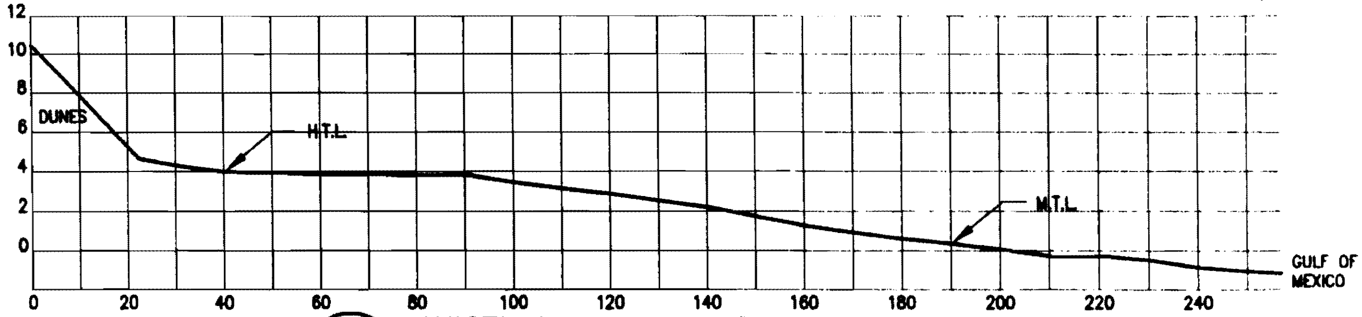
EXISTING CONDITIONS 2/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 3 IS LOCATED 300' NORTH OF MARKER 35 LOOKING NORTH.
4. SECTION 4 IS LOCATED AT MARKER 22 LOOKING NORTH.



4 | 1 3 EXISTING CONDITIONS – SECTION

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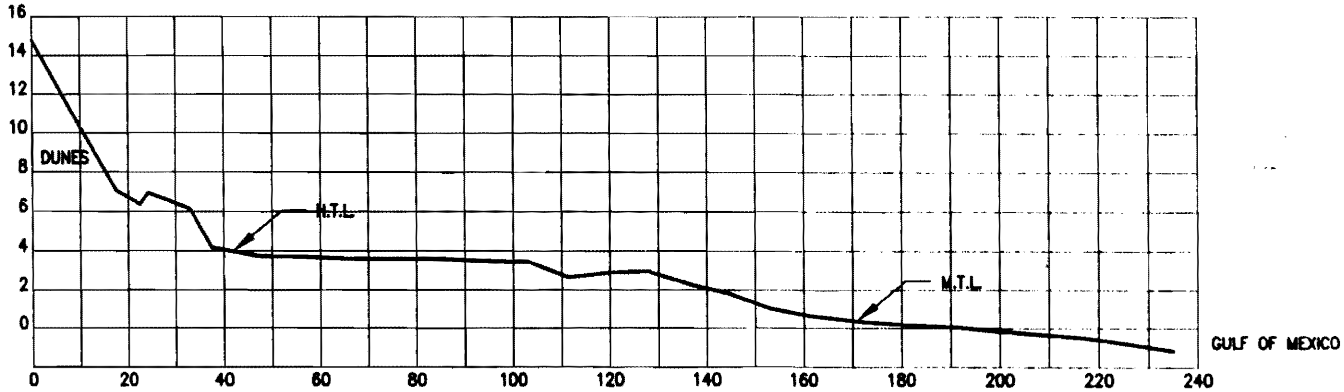

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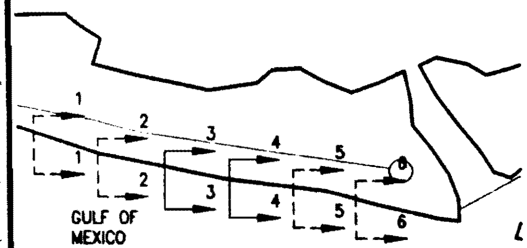

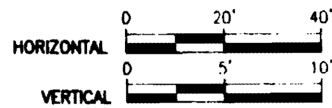

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Corpus Christi, Texas 78478

EXISTING CONDITIONS 3/3

6 EXISTING CONDITIONS – SECTION

1 | 4

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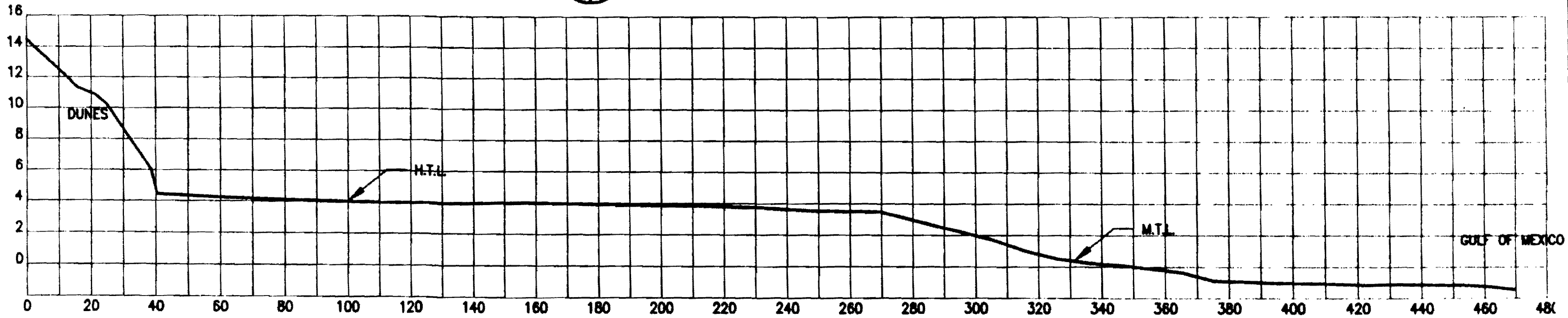

5 EXISTING CONDITIONS – SECTION

1 | 4

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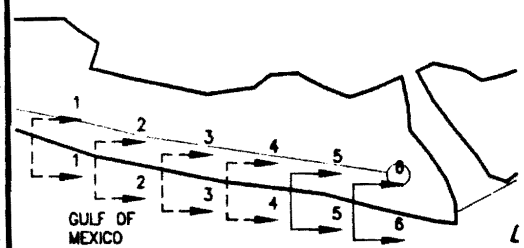

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR/SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 5 IS LOCATED AT MARKER 10 LOOKING NORTH.
4. SECTION 6 IS LOCATED SOUTH OF LANTANA DRIVE BY DUNES CONDOMINIUM.

HORIZONTAL 0 25' 50'

VERTICAL 0 5' 10'

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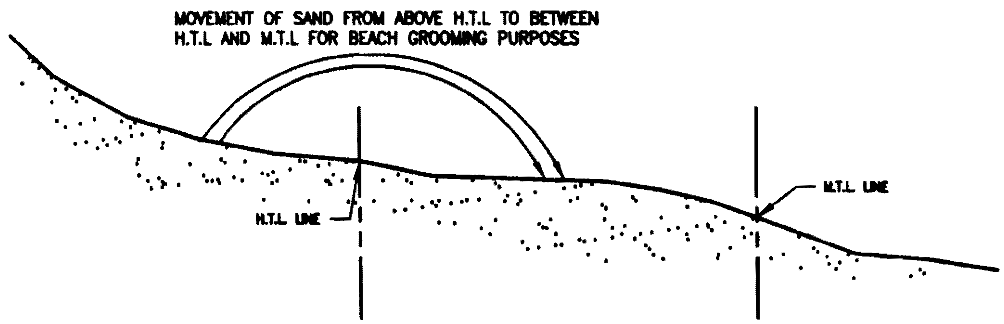
PROPOSED BEACH MAINTENANCE PRACTICES

OCT 30 2007



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

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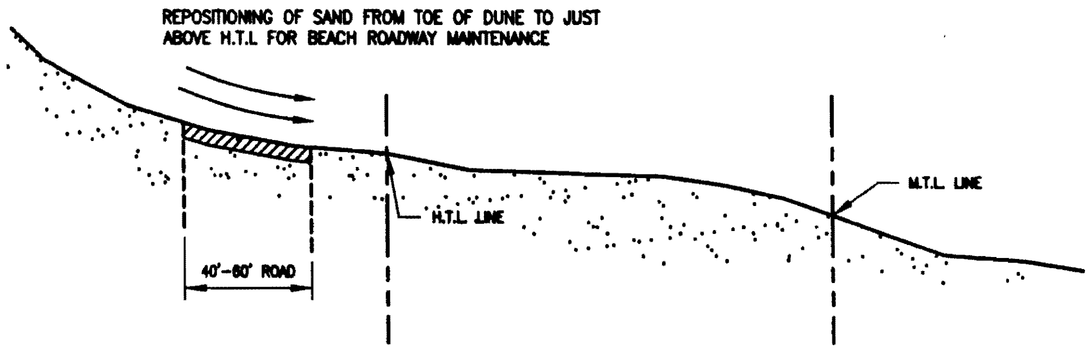

2 | 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

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Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

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APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 06/07 | REV. DATE: 8-14-2007 | DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

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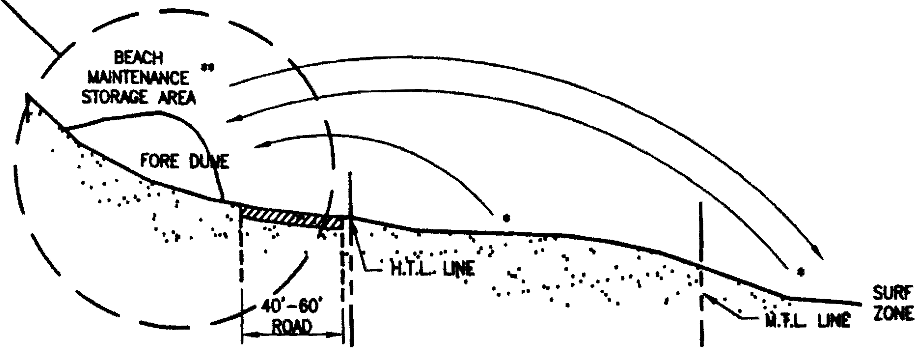
PROPOSED BEACH MAINTENANCE PRACTICES

1 | 7 8 — SEE DETAIL FOR ALTERNATE PLACEMENT AREAS ON SHEET 8 OF 8

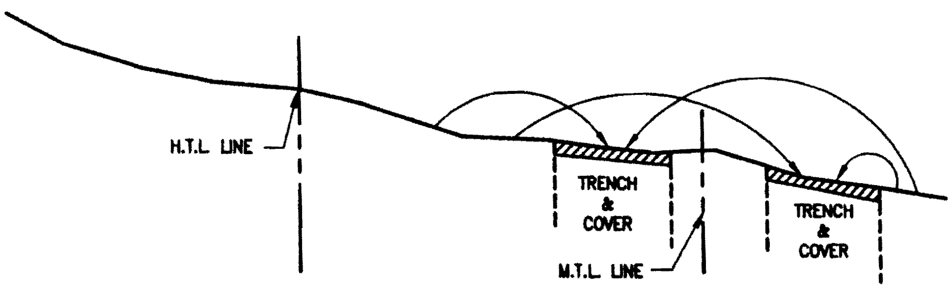


* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.

1 | 1 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

1 | 5 5 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

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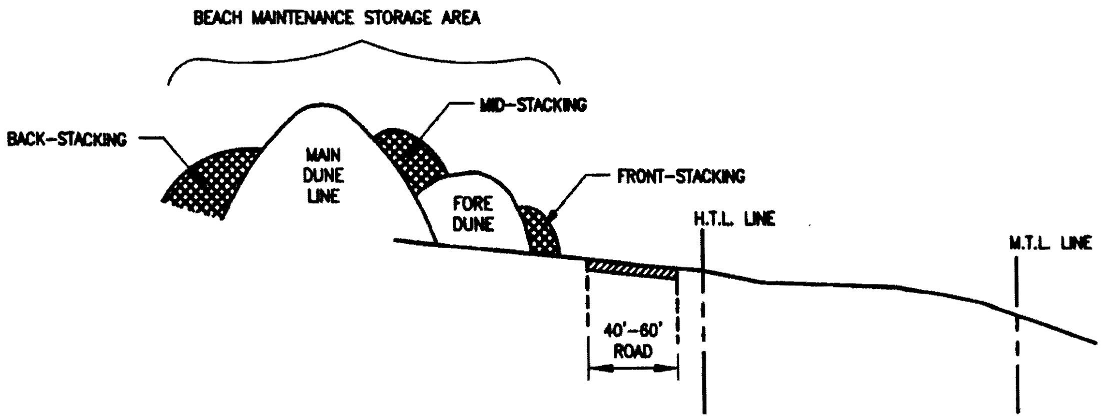
APPLICANT: CITY OF PORT ARANSAS			HDR | SHINER MOSELEY AND ASSOCIATES, INC. 555 N. Carancahua, Suite 1650 Corpus Christi, Texas 78478	
PROJECT NAME: GULF BEACH CLEANING				
COUNTY: NUECES				
DATE: 06/07	REV. DATE: 8-14-2007	DATUM:	PROJECT No: 66107	SHEET 07 of 08

PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

ALTERNATE PLACEMENT AREAS

SAND/SARGASSUM IS PROPOSED TO BE PLACED IN THREE LOCATIONS WITHIN THE BEACH MAINTENANCE STORAGE AREA:

A. FRONT -STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM ABOVE H.T.L AT BASE OF FOREDUNE ON ACCRETING BEACHES ONLY.

B. MID-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM WITHIN TROUGHS BEHIND THE FOREDUNE ON ALL BEACHES.

C. BACK-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM IN BACK OF THE MAIN DUNE LINE ON ALL BEACHES.

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555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 08 of 08

Attachment 2

Habitat Monitoring

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008

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INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be

permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of

sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment** - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 ft. long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 ft. long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 ft. long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 ft. survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 ft. survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 ft. survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 ft. survey area (location to be determined)

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous

beach profile within the 200 ft. survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 ft. survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 ft. long survey area. The number of birds, species types, behavior, and location within the 200 ft. survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

REPORTING RESULTS

The City's consultant compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years.

Elise Calvert
Calvert

10 FEB 09

SWG-2007-1847 - Consultation Mtg w/ FWS
Mary Orms, Dawn Whitehead, Chemaine Broerst,
~~Jeff~~ Pollack, David Parson, J. Wong

Jan 5, 09 - Start of Initiation.
Re

A ① Conference Opinion for Critical Habitat for Piping Plover Habitat. (Not for Bird Itself)
"Requested today"

② on which Time Consultation will occur
- Opinion for the City - 5 year Permit Time.
- Pier to Jetty is Nueces County

Front Stacking to be discontinued once COE Permit is issued.

③ - 10 PSI - will be tried & be part of monitoring effort (page 3)

pg 15 Get Citation for Statement
pg 16, pg 18 - see page notes

④ Do Not Remove all sargassum. Primary Constituent Element
⑤ Monitoring Rpt to include "Control Area
* Identify a Control Area

10FEB09 Consultation Mtg - Page 2

* Corps is supposed to send an annual monitoring rpt.

Ltr

1. Confirm Opinion
2. Clarify gap between City of Port A Jetties
3. Address 2" Provision
4. TGLO Lands. - Explain
5. Identify Control Point

FEB 2 0 2009

FEB 2 4 2009

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

February 13, 2009

Casey Cutler, Assistant Chief
Regulatory Branch
Department of the Army
Galveston District
Corps of Engineers
P.O. Box 1229
Galveston, TX 7753-1229

Consultation Number 21410-2008-F-0099

Dear Mr. Cutler:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) January 5, 2009, receipt of your December 16, 2008, letter requesting initiation of formal section 7 consultation under the Endangered Species Act. Included with the December 6th letter was the *Biological Assessment of Potential Impacts to Threatened and Endangered Species* (BA) dated December 5, 2008, for our review. The consultation concerns the possible effects of the proposed issuance of Corps of Engineers (USACE) Permit SWG-2007-01847 for the City of Port Aransas to conduct beach cleaning in Nueces County, Texas on the endangered Kemp's ridley sea turtle *(Lepidochelys kempii)*, the threatened green sea turtle *(Chelonia mydas)*, the threatened loggerhead sea turtle *(Caretta caretta)* and the threatened piping plover *(Charadrius melodus)* and its proposed critical habitat.

The COE also requested concurrence with your determination of "may affect, but is not likely to adversely affect" for the endangered brown pelican (*Pelecanus occidentalis*), threatened piping plover, endangered Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), and the endangered leatherback sea turtle (*Dermochelys coriacea*). Based on current research and information, the Service concurs with the USACE's determination of "may affect, but is not likely to adversely affect" for the above listed species. However, the Service will analyze whether the issuance of the permit will result in an adverse modification to piping plover proposed critical habitat and issue a conference opinion as well as a biological opinion.

On January 14, 2009, the Service received an email from the City of Port Aransas' consultant requesting a meeting to discuss the BA and the meeting was scheduled for February 10, 2009. Discussions included clarification of miles to be cleaned, timing and use of equipment, monitoring surveys, critical habitat units, placement of sargassum, potential nourishment projects, habitat monitoring plan, and determinations of effect. At the conclusion of the meeting, the USACE, City of Port Aransas and the Service agreed the BA would be revised and finalized. The USACE also requested a conference opinion be issued for proposed piping plover habitat.

Therefore, all information required to initiate consultation was addressed at the meeting and will be included in the Final BA. We have assigned log number 21410-2008-F-0099 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological and conference opinions (unless we mutually agree to an extension). Therefore, we expect to provide you with our final biological and conference opinion no later than May 20, 2009.

As a reminder, the Endangered Species Act requires that after initiation of formal consultation, the federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence or endangered or threatened species or destroying or modifying their critical habitats.

If you have questions or concerns about his consultation or the consultation process in general, please contact me or Mary Orms of this office at 361-994-9005.

Sincerely,

E. Dawn Whitehead

for Allan M. Strand
Field Supervisor

cc: John Wong, USACE, 5151 Flynn Parkway #306, Corpus Christi, TX 78411-4318
Lloyd Mullins, USACE, 5151 Flynn Parkway #306, Corpus Christi, TX 78411-4318

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
CORPUS CHRISTI REGULATORY FIELD OFFICE
5151 FLYNN PARKWAY, SUITE 306
CORPUS CHRISTI TX 78411-4318

February 23, 2009

REPLY TO
ATTENTION OF:
Regulatory Branch

SUBJECT: Consultation No. 21410-2008-I-0099; SWG-2007-1847

U.S. Fish & Wildlife Service
Attn: Mr. Alan Strand
Field Supervisor
Ecological Services
TAMU-CC Box 338
Corpus Christi, TX 78412

Dear Mr. Strand:

This letter is in reference to the February 10, 2009 meeting between members of your office, the applicant, and staff from our Corpus Christi Regulatory Field Office regarding Consultation Number 21410-2008-I-0099, which pertains to proposed beach maintenance activities by the City of Port Aransas as proposed in public notice SWG-2007-1847.

At that meeting a Conference Opinion for the piping plover critical habitat was requested. You were also informed that the proposed active period for the permit, if issued, will be five years and thus any related Biological Opinion is also sought for this same time period. The applicant also clarified that the proposed beach maintenance does not include that beach segment from the South Port Aransas jetty to the Horace Caldwell Pier at Lantana Drive, which is the responsibility of Nueces County.

Please note that the practice of retrofitting beach maintenance equipment tires so that they are inflated to no greater than 10 PSI will be considered for testing and implementation if it is necessary to reduce or eliminate excessive rutting. Because this method not been implemented in Texas to our knowledge, the practicality and effectiveness of this procedure derived from any testing and/implementation will be monitored and reported.

As discussed in our February 9, 2009 meeting, attached is a revised Biological Assessment (BA) that corrects the minor errors and erroneous inclusions contained in the previously submitted December 5, 2008 BA regarding this consultation. Please note that the Habitat Monitoring Effort has also been revised to add a control area as well as the matter of retrofitting equipment tires.

Should you have any questions, please contact the Project Manager, John Wong, at the above letterhead address or by telephone at 361-814-5847.

Sincerely,

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office

Enclosure

Copy furnished:

Mr. Jeffrey Pollack
HDR/Shiner Moseley and Associates, Inc.
Corpus Christi, TX

BIOLOGICAL ASSESSMENT OF POTENTIAL IMPACTS TO THREATENED AND ENDANGERED SPECIES

DEPARTMENT OF THE ARMY PERMIT APPLICATION SWG-2007-01847
BY
CITY OF PORT ARANSAS

U.S. ARMY ENGINEER DISTRICT, GALVESTON
DECEMBER 5, 2008 (Rev. Feb. 23, 2009)

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ATTACHMENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

The purpose of this Biological Assessment (BA) is to fulfill the U.S. Army Corps of Engineer's (USACE) requirements as outlined under Section 7(a) of the Endangered Species Act (ESA) of 1973 as amended. The proposed action requiring the assessment is Department of the Army (DA) permit application SWG-2007-1847 which would authorize beach maintenance activities along a 7 mile stretch of beach extending from the southern end of the City of Port Aransas city limits north to Lantana Drive in Port Aransas, Mustang Island, Nueces County, TX. The work is proposed pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Table 1 is a list of federally listed species in Nueces County presented in this BA. For the purposes of this BA, the project area is defined as the area where the actual beach maintenance will take place, as depicted in the DA SWG-2007-1847 permit application drawings (Attachment 1).

1.2 DESCRIPTION OF THE PROPOSED ACTION

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill.
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide
**only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

Schedule of Work:
Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.
Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm.

The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance (Attachment 1, Sheet 2):

1. **Priority Area A -** High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (7:00 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B -** Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C -** Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

Any additional work conducted on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into Texas General Land Office beach maintenance storage areas located above HTL and in the front-stacking area. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders –** The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake –** This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

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- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

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- **Garbage Trucks –** Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities result in ruts greater than two inches deep, the City will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement it if found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

The City of Port Aransas typically has the following Public Works Staff assigned to beach maintenance:

- **4 Full-time Heavy Equipment Operators** - Responsible for running all heavy equipment such as front-end loaders, tractors, and motor graders; primarily responsible for removal of sargassum and roadway maintenance.

- **2 Supervisors** - Responsible for coordinating activities of the heavy equipment operators, ground custodians, and other Public Works staff. Also can be responsible for running all heavy equipment such as front-end loaders, tractors, and motor.

- **6 Full-time Ground Custodians** – Responsible for picking up trash and debris from the beach as well as from designated trash receptacles.

- Between 15 March and 30 July of each year, a trained turtle monitor will be onsite in the immediate area where the beach is being maintained while activities are underway to be alert for any sign of turtles or turtle nests which may be impacted. Additionally, the monitor will advise the City as to the degree of any rutting that may be occurring as a result of the beach maintenance.

1.3 SUMMARY OF ALTERNATIVES CONSIDERED

City staff has conducted a cost evaluation and practicality review for a number of beach maintenance and sargassum management alternatives.

Off-site Disposal

As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law prohibits any sand from being removed from a barrier island.

Non-mechanized Removal

Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

Mechanical Alternatives

The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

No and Minimal Action Alternatives

The City has already initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

Alternative	Meets Objectives?	Physically Practical?	Financially Practical?	Legally acceptable?
No-action	No	Yes	Yes	No
Non-mechanized maintenance	No	No	Yes	Yes
Mechanized maintenance (off-site disposal)	Yes	No	No	No
Mechanized maintenance (on-site disposal)	Yes	Yes	Yes	Yes

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2.0 IMPACT ASSESSMENT FOR LISTED SPECIES

To assess the potential impacts of the proposed project on endangered and threatened species, USACE Galveston District personnel and the applicant had meetings with the FWS, telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on these species. Significant literature sources relied upon in the preparation of this BA include the FWS series on endangered species of the seacoast of the U.S. (National Fish and Wildlife Laboratories (NFWL), 1980), Federal status reports and recovery plans, and performance reports of the Texas Parks and Wildlife Department (TPWD).

Of the 13 endangered species listed in Table 1 that are potentially present in the project area, possible impacts to the piping plover and five species of sea turtle have been identified to result from this project.

TABLE 1
ENDANGERED AND THREATENED SPECIES OF POTENTIAL OCCURRENCE IN THE DA PERMIT APPLICATION SWG-2007-1847 PERMIT AREA IN NUECES COUNTY, TEXAS[1]

Common Name	Scientific Name	Federal Listing Status
Gulf Coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered
Ocelot	*Leopardus pardalis*	Endangered
Brown pelican	*Pelecanus occidentalis*	Endangered
Piping plover	*Charadrius melodus*	Threatened w/critical habitat in Texas
Slender Rush Pea	*Hoffmannseggia tenella*	Endangered
Kemps Ridley turtle	*Lepidochelys kempii*	Endangered
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered w/critical habitat designated (or proposed) outside Texas
Leatherback sea turtle	*Dermochelys coriacea*	Endangered w/critical habitat designated (or proposed) outside Texas
Green sea turtle	*Chelonia mydas*	Threatened w/critical habitat designated (or proposed) outside Texas
Loggerhead sea turtle	*Caretta caretta*	Threatened
South Texas Ambrosia	*Ambrosia cheiranthifolia*	Endangered
West Indian Manatee	*Trichechus manatus*	Endangered
Whooping Crane	*Grus americana*	Endangered

[1] According to U.S. Fish and Wildlife Service letter dated December 31, 2007 regarding DA application SWG-2007-1847.

2.1 GULF COAST JAGUARUNDI

2.1.1 Reasons for Status

The jaguarundi *(Herpallurus yagouaroundi cacomitli)* was listed by FWS as endangered on June 14, 1976 (41 FR 24064). Habitat loss and alteration due to brush-clearing activities, and human persecution are the main causes for the decline in jaguarundi populations (FWS, 1995a).

2.1.2 Habitat

Habitat requirements in Texas are similar to those for the ocelot: thick, dense thorny brushlands or chaparral. Approximately 1.6% of the land area in south Texas is this type of habitat (Tewes and Everett, 1987). The thickets do not have to be continuous and may be interspersed with clear areas. Jaguarundis possibly show a preference for habitat near streams (Goodwyn, 1970; Davis and Schmidly, 1994). In South America, habitat includes high mountain forests, tropical forests, swamp forests, savannahs, overgrown pastures, and thickets (NFWL, 1980; Tewes and Schmidly, 1987).

The most common plants occurring in habitats in the Rio Grande Valley where the jaguarundi is known to occur are huisache, blackbrush acacia, prairie baccharis *(Baccharis texana),* chillipiquin *(Capsicum annuum),* lotebush, allthorn goatbush, Texas persimmon *(Diospyros texana),* coyotillo *(Kawinskia humboldtiana),* common lantana *(Lantana horrida),* berlandier wolfberry *(Lycium berlandieri),* javelina brush *(Microrhamnus ericoides),* Texas prickly pear *(Opuntia lindheimen),* retama, honey mesquite, cedar elm *(Ulmus crassifolia),* and lime pricklyash *(Zanthoxylum fagara)* (Goodwyn,1970).

Jaguarundis have two distinct color phases, red and gray, although the latter phase has also been called blue. The phases are so distinct that at one time they were thought to be separate species, the red one being called *Felis eyra.* A third color phase, black, has also been reported, but apparently does not occur in Texas (Goodwyn, 1970).

Like the ocelot, the jaguarundi is primarily nocturnal, although some diurnal activity has been recorded. Jaguarundis are excellent climbers although they spend most of the time on the ground. Prey is largely birds, but bird eggs, rats, mice, rabbits, reptiles and fish are also taken (Goodwyn 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Jaguarundis communicate by calls, of which 13 have been identified in captive animals. The largest repertoire occurs during the mating season (Hulley, 1976).

Little is known of jaguarundi reproduction in the wild. Den sites include dense thickets, hollow trees, spaces under fallen logs overgrown with vegetation, and ditches overgrown with shrubs (Tewes and Schmidly, 1987; Davis and Schmidly, 1994). Young have been born in March and August and possibly two litters occur per year. Usually 2 to 4 young comprise a litter, with litters being either all of one color phase or containing both the red and gray phases. Gestation (for captive jaguarundi) varies from 63 to 75 days (Goodwyn, 1970; Tewes and Schmidly, 1987; Davis and Schmidly, 1994).

2.1.3 Range

The jaguarundi historically occurred in southeast Arizona, south Texas, and Central and South America as far south as northern Argentina. Today this cat has a similar distribution, but in much reduced numbers, although it probably no longer occurs in Arizona (Tewes and Schmidly, 1987). The presence of jaguarundis in Florida is likely the result of human introduction (Nowak and Paradiso, 1983).

Four North American subspecies are recognized, of which two occur in the U.S.: *H.y. cacomitli* from southern Texas to central Vera Cruz, Mexico, and *H.y. tolteca* from southern Arizona, along the Pacific coast of Mexico, and inland to the Mexican Plateau (Goodwyn, 1970; NFWL, 1980).

2.1.4 Distribution in Texas

Tewes and Everett (1987) analyzed the records of a clearinghouse established in 1981 to coordinate reception and filing of reports of jaguarundis (and ocelots) in Texas. Many of the reports were solicited by sending out questionnaires to trappers. Jaguarundis were reported from central Texas and the upper Gulf coast as well as from south Texas. Two dead jaguarundis were reported in Cameron County and one each in Willacy and Webb counties. Tewes (1987) and Tewes and Everett (1987) documented several other credible reports of jaguarundis in these three counties. One of these was of a road-killed male jaguarundi found near the junction of SH 4 and Farm-to-Market Road (FM) 511 (Kellers Corner) in Cameron County on April 21, 1986 (Tewes, 1987; Laack and Rappole, 1 987b). Although this was the last confirmed record of a jaguarondi in Texas (Laack, 1998), unconfirmed jaguarundi sightings in Hidalgo County include Bentsen Rio Grande State Park, Santa Ana NWR, Lower Rio Grande Valley NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of the TPWD Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Unconfirmed but reliable sightings of a jaguarundi occurred at the Sabal Palm Grove Sanctuary in Cameron County in 1988 (Anonymous, 1989). Recent jaguarundi sightings have been reported from the Santa Ana NWR for March 1998 (Santa Ana NWR data). Based on sighting reports, personnel of the Santa Ana NWR suspect the presence of jaguarundis on the refuge (Benn, 1997).

Tewes and Everett (1987) concluded that until verifiable evidence of jaguarundis from central Texas and the upper Gulf coast was forthcoming, jaguarundi distribution in Texas should be considered as restricted to the Rio Grande Valley. The number of jaguarundis in Texas is unknown, but certainly less than that of ocelots.

2.1.5 Presence in the Project Area

Jaguarundis are not known to occur within the project area due to lack of suitable habitat. The last documented siting of the species occurred more than 130 miles south of the project area on the mainland where suitable thorn-scrub habitat is available.

2.1.6 Effects of the Project

This project is expected to have no effect on the jaguarundi, as it is unlikely to occur on the beach area near project activities due to the lack of suitable brushy habitat.

2.1.7 Conservation Measures

Because no potential effects to the jaguarundi will occur as a result of the proposed project, no additional conservation measures are needed.

2.1.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the jaguarundi.

2.2 OCELOT

2.2.1 Reasons for Status

The ocelot *(Leopardus pardalis)* is listed as endangered throughout its present range (FWS, 1995a, 2000b). Habitat destruction and degradation due to brush-clearing has been the major cause for its population decline, but predator control activities and hunting have also contributed. In Central and South America, exploitation for the fur and pet trade is primarily responsible for population declines (NFWL, 1980; FWS, 1995a).

2.2.2 Habitat

The ocelot occupies a variety of habitats throughout its neotropical range including tropical and subtropical forests, riverine forests, swampy savannahs, estuarine mangroves, rocky areas, and upland oak forests (NFWL, 1980; Tewes and Schmidly, 1987; Murray and Gardner, 1997). In Texas, however, ocelots inhabit dense, often thorny and impenetrable brush, mesquite-oak and oak forests, and partially cleared land (NFWL, 1980; Navarro, 1985). Tewes (1986) found honey mesquite, acacias, condalia *(Condalia* spp.), allthorn goatbush *(Castella toxana),* granjeno, cenizo, and whitebrush *(Aloysia texana)* to be the dominant brush species of ocelot habitat in south Texas. Approximately 1.6% of the land area in south Texas now supports this type of habitat (Tewes and Everett, 1987).

Tewes and Everett (1987) classified ocelot habitat in Texas according to the amount of foliar canopy. Class A or optimal habitat was 95% canopy cover, Class B or suboptimal habitat was 75% to 95% canopy cover, and Class C, with 75% or less canopy cover, was considered inadequate. The most critical component of habitat is probably dense cover near the ground (<3 feet in height) (Tewes, 1986).

The ocelot is primarily nocturnal, although some diurnal activity has been recorded (Navarro, 1985; Tewes, 1986; Tewes and Schmidly, 1987). Navarro (1985) found ocelots in Texas to have two peaks of activity, one at about midnight and the other at daybreak. Ocelots feed on small and medium-sized mammals such as woodrats *(Nootoma* spp.), rabbits *(Sylvilagus* spp.), young deer *(Odocoious* spp.), nutria *(Myocastor coypus),* birds, reptiles, amphibians, fish, insects and, in Latin America, spider monkeys *(Ate/es* sp.), coatis *(Nasua nasua),* and agoutis *(Agouti* sp.) (Hall and Dalquest, 1963; Guggisberg, 1975; Navarro, 1985; Tewes and Schmidly, 1987; Emmons, 1988).

Although breeding occurs throughout the year in the tropics, it occurs primarily in the fall (September through November) in Texas; however, births have also been recorded in April, June, July and August. Den sites are usually well hidden and include dense, thorny scrub, caves, hollows in trees or logs, and grass tussocks (Petrides et al., 1951; Navarro, 1985; Tewes, 1986; Laack and Rappole, 1986, 1987a; Tewes and Schmidly, 1987). Gestation is 70 to 80 days. Litter size ranges from two to four, with two being the most common. The mother provides extended parental care to the young because it takes time for them to become proficient at capturing prey. Males are believed to contribute little towards direct parental care (Tewes, 1986). Ocelots in the wild become sexually mature at 16 to 18 months (Schauenberg, 1979), but in captivity, maturity may be reached in as little as 10 to 12 months.

Navarro (1985) found that the average home range (the area that an animal occupies during its normal daily activities) for three male ocelots in south Texas was 618 acres, and for one female was 519 acres. Similarly, Twedt and Rappole (1986) reported home ranges of 865 and 296 acres for two male ocelots on Yturria Ranch in Willacy and Kenedy counties. However, Tewes (1986), using a much larger database, found the average home range of south Texas ocelots to be 4,372 acres for males and 2,717 acres for females. The overall average for adults was 3,754 acres. Although male ocelots had larger territories than the females and generally covered an extensive area in a short period, females used the home range more intensively (Tewes, 1986; FWS, 1990b). Tewes (1986) also determined that home ranges expanded in the winter and contracted in the summer. Both Navarro (1985) and Tewes (1986) found little overlap in the home ranges of adjacent males, but quite a considerable intersexual spatial overlap in the home ranges. Tewes and Schmidly (1987) and Navarro (1985) also found that the home ranges were closely aligned with the amount of suitable available habitat. At Laguna Atascosa NWR, for example, an increase in the ocelot population has resulted in smaller home ranges, two ocelots occupying an area that had previously supported only one (Tewes, 1988). Some individuals there currently inhabit areas as small as 80 acres (Tewes, 1988).

2.2.3 Range

Historically, the ocelot occurred in Arkansas, Arizona, southern California, and south through Central and South America to Peru, Uruguay, and northern Argentina (Navarro, 1985). Today it ranges from Arizona and Texas through Central and South America to northern Argentina, but in reduced numbers (Tewes and Everett, 1987; Emmons, 1990; Murray and Gardner, 1997).

2.2.4 Distribution in Texas

The ocelot once occurred in the eastern, central and southern portions of Texas, but currently only exists in the extreme south of the State (Davis and Schmidly, 1994). As a first step to determining the status of the ocelot in Texas, a clearinghouse for ocelot (and jaguarundi) sightings was established in October 1981 to coordinate reception and filing of reports. A total of 1,572 questionnaires was mailed to trappers to obtain additional information; of these, 472 (30%) were returned and 87 (6%) contained positive responses (Tewes and Everett, 1987). From these results, it appears that two significant populations of ocelots exist in south Texas. One population inhabits parts of Hidalgo, Starr, Cameron, and Willacy counties, and the other, Jim Wells, Live Oak, McMullen and Atascosa counties. Six or seven smaller populations may also occur. Based on studies of spatial patterns and densities of radio-collared ocelots, Tewes (1986) estimated that only 80 to 120 ocelots occur in Texas. Laack (1998) currently puts this number at 100. A population of approximately 30 to 40 ocelots occurs on the Laguna Atascosa NWR in Cameron County (Laack, 1998). One or two ocelots apparently occur at the Santa Ana NWR (Benn, 1997; Laack, 1998), and one pair of ocelots had territories near the Arroyo Colorado in Cameron County (Laack, 1998). Ocelots have been sighted at the NAS's Sabal Palm Grove Sanctuary (Homerstad, 1986); and at the Loma de Grulla complex north of Laguna Vista, at Moranco Blanco, and at Redhead Ridge (Tewes, 1987). Ocelot sightings have also been reported from the Lower Rio Grande Valley NWR. In addition, Laack and Rappole (1986, 1987a), Tewes (1987) and Homerstad (1987) have documented several other ocelot sightings in Cameron County. The closest ocelot population in Mexico is near San Fernando, approximately 100 miles south of the U.S.-Mexico border (Laack, 1998).

2.2.5 Presence in the Project Area

Ocelots are not known to occur within the project area due to lack of suitable habitat. Species populations are known to occur more than 130 miles south, and more than 50 miles west of the project area on the mainland where dense, brushy habitat is present.

2.2.6 Effects of the Project

This project is not expected to affect the ocelot, since it is unlikely to occur in the vicinity of project activities due to the lack of suitable brushy habitat in these areas.

2.2.7 Conservation Measures

Because no potential effects to the ocelot will occur as a result of the proposed project, no additional conservation measures are needed.

2.2.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the ocelot.

2.3 BROWN PELICAN

2.3.1 Reasons for Status

The brown pelican *(Pelecanus occidentalis)* was listed as endangered throughout its foreign range on June 2, 1970 (35 FR 8495) and throughout its U.S. range on October 13, 1970 (35 FR 16047). Population declines were attributed largely to chlorinated hydrocarbon residues from the use of pesticides, such as DDT compounds (DDE, DDD, and DDT), polychlorinated biphenyls (PCBs), dieldrin, and endrin, which caused eggshell thinning; thus, eggs became desiccated and were more easily broken during incubation (NFWL, 1980). Other factors included human disturbance and loss of habitat due to commercial and residential development (FWS, 1995a). Pelicans are large, heavy birds and easily flushed from the nest. Flushing exposes the eggs and young to predation, temperature stress and permanent abandonment by the parents.

A ban on the use of DDT in the U.S. in 1972, together with efforts to conserve and improve remaining populations, has led to increased numbers of brown pelicans. Populations in some areas have increased to historical breeding levels or above, with stable population numbers and productivity. The brown pelican has been delisted along the U.S. Atlantic coast and, in Florida and Alabama, along the Gulf coast. It remains endangered throughout the rest of its range, which includes Mississippi, Louisiana, Texas, California, Mexico, Central and South America, and the West Indies. In May 1998, the FWS announced its intention to either delist or downlist to threatened status numerous species, including the brown pelican (63 FR 25502—25512; May 8, 1998).

2.3.2 Habitat

Brown pelicans inhabit shallow coastal waters with water depths up to 80 feet (Palmer, 1962; NFWL, 1980; Fritts et al., 1983). They are rarely found inland and do not venture more than 20 miles out to sea except to take advantage of particularly good feeding situations (FWS, 1980). Distances of 61 miles from shore have been recorded (Fritts et al., 1983). Brown pelicans, which are colonial nesters, usually nest on undisturbed offshore islands in small bushes and trees, including mangroves, and in humid forests (NFWL, 1980; Guzman and Schreiber, 1987). Occasionally they nest on the ground and preferred sites are those free from human disturbance, flooding, and terrestrial predators, such as raccoons and coyotes. Brown pelicans utilize beaches, sandbars, sand spits, mud flats and even manmade structures such as piers, wharves, pilings, oil/gas platforms, and docks for loafing (NFWL, 1980). No critical habitat has been designated for this species.

2.3.3 Range

The brown pelican occurs along the Pacific coast of the Americas from southern British Columbia south to Cape Horn and throughout the Atlantic, Gulf and Caribbean coastal areas from New Jersey south to eastern Venezuela. In North America, it occasionally ventures inland north to North Dakota, Ontario and Nova Scotia. Its breeding range is more restricted: along the Pacific coast from central California south to Chile, including the Galapagos Islands; and from

North Carolina, south to eastern Venezuela, the West Indies, Greater Antilles, and Virgin Islands (American Ornithologists' Union (AOU), 1998).

In North America, two subspecies are recognized: the eastern brown pelican (*P.o. carolinensis*) ranging from North Carolina south through Florida and west to Texas, and the California brown pelican (*P.o. californicus*) in California (NFWL, 1980). For the eastern subspecies, the present range is the same as the historical one, but in reduced numbers. It became extirpated in Louisiana in 1966, but has since (beginning in 1968) been reintroduced from Florida. It has never been known to nest in Mississippi or Georgia (FWS, 1980; 50 FR 4938, February 9, 1985). Brown pelican colonies are known to occur on the east coast of Mexico off the eastern tip of the Yucatan Peninsula (Mabie, 1986, 1988).

While some migration occurs after nesting in both subspecies, many individuals overwinter close to their breeding grounds (FWS, 1980). Atlantic coast populations move southward in the fall, with most birds wintering in the U.S., particularly in Florida. Some birds, however, disperse to the Cuban coast (Clapp et al., 1982). Gulf coast birds tend to remain on the Gulf coast, although Texas and Louisiana birds have been recovered in Mexico and Cuba (Palmer, 1962; Clapp et al., 1982).

2.3.4 Distribution in Texas

Historically, the brown pelican was a common bird of the Texas Gulf coast with an estimated breeding population of 5,000 pairs residing in 17 colonies in 1918 (Mabie, 1990). By the 1960s, however, it was almost extirpated. In 1963, only 14 breeding pairs were recorded along the Texas coast and in 1964 no known nesting occurred (Mabie, 1986). The decline started during the 1920s and 1930s due to human disturbance (Oberholser, 1974), but continued due to pesticide contamination (King et al., 1977; Mabie, 1986). Since the 1960s, the brown pelican has made a gradual comeback in Texas with an estimated 2,400 breeding pairs in 1995 (Campbell, 1995). Most of the breeding birds have traditionally been found on Pelican Island in Corpus Christi Bay, Nueces County, and Sundown Island near Port O'Connor in Matagorda County. Smaller groups or colonies occasionally nest on Bird Island in Matagorda Bay, a series of older dredged material islands in West Matagorda Bay, Dressing Point Island in East Matagorda Bay, and islands in Aransas Bay (Campbell, 1995). No current nesting sites are known from the lower Texas Coast. Although brown pelican colonies are not monitored every year, 1,900 and 750 pairs nested on Pelican Island in 2003 and 2004 respectively, and on Sundown Island, 1,714 pairs nested in 2005 and 987 pairs nested in 2004 (FWS, 2005a). Recent predation on Pelican Island resulted in no observed 2005 breeding pairs, which has possibly led displaced breeding pairs to use Shamrock Island with 340 pairs, and Sunfish Island with 30 pairs, both islands which are located in Corpus Christi Bay. Further to the south, 100 breeding pairs were observed on a Laguna Vista island in 2004 (FWS, 2005a).

2.3.5 Presence in the Project Area

In Texas, the brown pelican occurs from Chambers County to Cameron County (Campbell, 1995), primarily along the lower and middle coasts. Occasional sightings are reported on the upper coast and inland to central, north-central, and eastern Texas (Texas Ornithological Society (TOS), 1995), usually on large freshwater lakes. Such occurrences are relatively uncommon. The Padre Island National Seashore (PAIS) checklist of birds lists the brown pelican as an uncommon from March through November and rare in winter and is more common on the Gulf side of Padre Island than in the Laguna Madre (Southwest Parks and Monuments Association (SPMA), 1990). Brown pelicans are likely to occur in the project area and immediate vicinity as post-breeding visitors or migrants.

2.3.6 Effects of the Project

This species is expected to forage in the project area or general vicinity on occasion, and it could potentially be temporarily affected from noise and activity from the proposed project. Because the nearest active nesting colony is at Shamrock Island, approximately 7.0 miles southwest of the proposed project at it closest point, nesting pelicans will not be impacted by the project. Direct impacts to loafing and feeding birds may result from beach maintenance vehicles and activities. Beach maintenance activities may disturb brown pelicans causing them to take flight and relocate to other feeding and loafing areas. This displacement will be temporary since birds disturbed by traffic or human activities generally move a short distance away and continue to perform their pre-disturbance behavior. No significant impacts to this species are anticipated as a result of this project.

2.3.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the status and habitats of this species. Because only temporary potential effects to the brown pelican may occur as a result of the proposed project, no additional conservation measures are identified.

2.3.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the brown pelican.

2.4 PIPING PLOVER

2.4.1 Reasons for Status

The piping plover *(Charadrius melodus)* was Federally listed as endangered on December 11, 1985, for the Great Lakes watershed and was listed as threatened throughout the remainder of its range (50 FR 50726). The rule became effective on January 10, 1986. In 1986, an estimated 2,100 to 2,300 breeding pairs occurred in North America: 1,337 to 1,409 pairs in the northern Great Plains, 19 to 24 pairs in the Great Lakes, and 799 pairs along the Atlantic coast (Haig et al., 1987). Shorebird hunting during the early 1900s caused the first known major decline of piping plovers (Bent, 1929). Since then, loss or modification of habitat due to commercial, residential, and recreational developments, dune stabilization, damming and channelization of rivers (eliminating sandbars, encroachment of vegetation, and altering water flows), and the draining of wetlands have further contributed to the decline of the species (FWS, 1995a). Additional threats include human disturbances through recreational use of habitat and predation of eggs by feral pets (FWS, 1995a).

2.4.2 Habitat

Piping plovers typically inhabit shorelines of oceans, rivers, and inland lakes. Nest sites include: sandy beaches, especially where scattered tufts of grass are present; sandbars; causeways; bare areas on emergent dredged material placement areas as well as natural alluvial islands in rivers; gravel pits along rivers; silty flats; and salt-encrusted bare areas of sand, gravel, or pebbly mud on interior alkali lakes and ponds. On the wintering grounds, these birds utilize beaches, mud flats, sand flats, dunes, and offshore spoil islands (AOU, 1998; FWS, 1995a). Much of the Laguna Madre in Mexico became less suitable as important wintering areas for this species when its water level was stabilized for a fisheries lagoon. In Texas, an estimated 30% of wintering habitat had been lost over a 20-year period (50 FR 50726; December 11, 1985). Critical habitat has been designated for this species in the project area as described below.

2.4.3 Range

The piping plover breeds on the northern Great Plains (Iowa, northwestern Minnesota, Montana, Nebraska, North and South Dakota, Alberta, Manitoba, and Saskatchewan), in the Great Lakes (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario), and along the Atlantic coast from Newfoundland to Virginia and (formerly) North Carolina. It winters on the Atlantic and Gulf of Mexico coasts from North Carolina to Mexico, including coastal Texas, and, less commonly, in the Bahamas and West Indies (AOU, 1998; 50 FR 50726, December 11, 1985). Migration occurs both through the interior of North America east of the Rocky Mountains (especially in the Mississippi Valley) and along the Atlantic coast (AOU, 1998). Little is known about the migration routes of this species.

2.4.4 Distribution in Texas

The piping plover begins arriving at its post-breeding and wintering grounds in Texas in mid to late July. Haig and Oring (1985, 1987) found that early in the post-breeding season, piping plovers frequented beaches, but later tended to inhabit ephemeral sand flats along the backside of barrier islands. Observations of wintering piping plovers in Alabama did not indicate a seasonal preference between habitats, although wintering plovers spent more than 85% of their time on sand flats or mud flats each month (Johnson and Baldassarre, 1988). Along the Texas coast, a correlation appears to exist between tidal height and habitat selection, with piping plovers actively feeding on tidal flats during periods of low tides, and on the Gulf beaches during high tides (Eubanks, 1991; Zonick, et al., 1998; Drake et al., 2000). Winter distribution studies along the Atlantic and Gulf coasts found piping plovers usually occurring in small, unevenly distributed groups along the coast; however, the sites with largest concentrations of plovers consisted of expansive sand flats or mud flats with sandy beach in close proximity (Nicholls and Baldassarre, 1990). Plovers on the wintering grounds suggest that they show some site fidelity, returning to the same stretch of beach year after year. On the lower Texas coast, individual plovers are known to use areas about 3,000 acres in size, moving 2 miles or more between foraging sites as tidal movements shift the availability of productive tidal flats (TPWD). Recent studies show significantly more stringent site fidelity with individual birds returning to more precise locations (+/-400 feet in lateral distance on the beach) each year (Amos, 2006). Piping plover concentrations in Texas occur in Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kleberg, Matagorda, Nueces, San Patricio and Willacy counties (FWS, 1988). FWS (1995a) estimates that approximately 1,900 piping plovers, or approximately 35%, wintered along the Texas Gulf coast.

Several areas along the Texas coast have been identified by the FWS as essential wintering habitat for the piping plover. Essential wintering habitat for the piping plover provides the space and requisite resources necessary for the continued existence and growth of piping plover populations and consist of coastal beach, sand flat and mud flat habitats.

Critical Habitat for the wintering grounds (as opposed to breeding population Critical Habitat) has recently been designated in Texas by the FWS (66 FR 36074—36078), some of which lies partially or entirely within the project area:

- TX-8- Mustang Island Beach – This is a stretch of beach extending from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas, TX. The landward boundary is the beginning of dense vegetation, and the gulfward boundary is MLLW.

Other Critical Habitat areas are located either adjacent to or very near, but not within the project area. These areas will not be disturbed by beach maintenance activities. These include:

- TX-5 – Upper Laguna Madre – This unit includes a series of small flats along the bayside of Padre Island in the Upper Laguna Madre. The landward boundary is the beginning of dense vegetation and the waterward boundary is the MLLW in the Laguna Madre. It is bounded in the north by the Nueces/Kleberg County line and in the south by the northern boundary of Padre Island National Seashore (PAIS).
- TX-6 – Mollie Beattie Coastal Habitat – Subunit 1 is bounded in the north by Beach Access Road 3, on the east by the inland boundary of critical habitat Unit TX-7, on the south by Zahn Road, and on the west by Zahn Road. Subunit 2 is bounded on the north by Corpus Christi Pass, on the east by SH 361, on the south by the north side of Packery Channel, and on the west by the Gulf Intracoastal Waterway.
- TX-7 – Newport Pass/Corpus Christi Pass Beach – This unit is along a stretch of Gulf beach 5.3 miles long. It is bounded on the north by Fish Pass, on the east by MLLW, on the south by St. Bartholomew Avenue, and on the west by a line marking the beginning of dense vegetation.
- TX-9 – Fish Pass Lagoons – This unit encompasses flats facing Corpus Christi Bay that extend 0.6 mile on either side of Fish Pass. The inland boundary is the line indicating beginnings of dense vegetation, and the bayside boundary is MLLW.
- TX-10 – Shamrock Island and Adjacent Mustang Island Flats – This unit encompasses

Shamrock Island, an unnamed small sand flat to the north of Wilson's Cut, and a lagoon complex that extends 2.2 miles to the southwest of Wilson's Cut. Critical habitat includes land to the line marking the beginning of dense vegetation down to MLLW.

On 26 July 2006, the United States District Court, Victoria County, Texas handed down a ruling in regards to a court case between the GLO and USFWS, which vacated the critical habitat rule adopted by the Service on July 10, 2001, (66 FR 36038) for 19 of the 37 Texas Critical Habitat units designated for the Wintering Piping Plover. This ruling remanded the service to conduct new rulemaking in accordance with all applicable federal laws. All of the above referenced areas, with the exception of TX-5 and TX-6 (located outside the immediate project area), were included in this ruling. As of the writing of this biological assessment, the USFWS is still re-evaluating these areas and reclassification of those units affected by this ruling has not been completed.

2.4.5 Presence in the Project Area

The piping plover is a regular migrant and winter resident along the lower Texas coast (Oberholser 1974; Haig and Oring, 1985, 1987; Haig and Plissner, 1993; TOS, 1995) and wintering birds have been reported along the length of the Texas coast. The PAIS checklist of birds lists the piping plover as a common winter resident but as an uncommon summer inhabitant of Gulf and bay environs within the seashore (SPMA, 1990).

During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW, 1996). The proposed project area was included in that survey.

Piping plover may occur throughout the project area, though with varying numbers and concentrations depending on annual fluctuations of the regional climate and time of year. Portions of former critical habitat area TX-8 is located on the Gulf of Mexico beach within the project area and contains a similar wide, sandy beach habitat type.

2.4.6 Effects of the Project

The effects of the proposed beach maintenance activities on the piping plover are expected to be minimal. In studies along the Laguna Madre, Drake et al. (2000) found that overall usage of relatively undisturbed beach habitats by wintering piping plovers, including both foraging and roosting activities, was minimal (2.8%). Piping plovers were found primarily to use beach habitats when other preferred habitats were unavailable, such as when algal and sand flats were inundated. This is considered to be partly due to the prime availability of forage species on tidal flats but also possibly due to the high level of disturbance on beach habitats (Drake et al., 2000). The entire beach area included in the permit application currently receives considerable use by recreational beach visitors. This high use does result in disturbance to piping plovers. Mechanized cleaning of the beaches will also result in some additional disturbance to individual birds using the beach; however, unlike the beach use by the public, beach maintenance activities tend to occur in only small segments of the beach at any one time and thus are likely to pose only a minor and temporary disturbance to resting and foraging birds when compared to general recreational use of the beach in general. Further, periodic cleaning of the beaches will result in the removal of large quantities of debris and sargassum, which, if not removed, result in the coverage of large expanses of the open beach. Some sargassum will indiscriminately be left in place as it is a primary constituent element for foraging piping plovers.

The effects of beach maintenance activities on piping plover habitat with respect to erosional impacts on habitat area are expected to be minimal. Erosion rates are increasing along most of the Texas coast; the proposed beach maintenance activities are not expected to have an appreciable influence on local erosion rates.

Trenching and burial of sargassum above the mean HTL may have potential effects on the foraging characteristics of the piping plover, however the Corps cannot confirm these potential effects due to lack of literature on this particular issue. One study (Amos, 2006) suggests that more piping plovers were observed on Mustang Island (a beach which is described as having a history of beach maintenance activity) than on St. Joseph Island, a beach that is not cleaned. In addition, this same study suggests a general increase of total plover counts on both Mustang Island and St. Joseph Island beaches in years of low sargassum levels than in years where the sargassum levels are considerably higher. These observations tend to show a positive effect on the piping plover where the beaches are more open with less occurrence of sargassum accumulation.

In summary, the proposed project is unlikely to result in any appreciable change in available critical habitat for the piping plover. Sargassum clearing activities may remove structure that plovers use for protection from the elements, but beach clearing is at a minimum during winter months when the birds are most likely to need protection from the elements. Further, sargassum removal may actually free up open beach foraging areas on a temporary basis. There will be no impact to plover nesting, as it does not occur in Texas. Wintering plovers that currently use the project area are already subjected to regular, and in some cases more prolonged, displacement by the public's recreational use of the beaches. Direct impacts to piping plovers from beach maintenance activities are most likely to occur during the spring and summer months when increased use of the beaches by the public necessitates intensified maintenance activities. Maintenance activities are at a minimum during winter months when plovers are more likely to be found in the proposed project areas. Most beach clearing activities are performed above the "wet beach" area and are thus above the portion of the beach most frequently used for foraging by plovers. Beach maintenance activities may temporarily displace plovers causing them to take flight, but displaced birds can easily relocate to adjacent habitat, as beach maintenance operations will be limited to only a fraction of the total project area at any given time. In fact, HDR/Shiner Moseley biologists have observed displaced birds relocating to other habitats, many of which are a short distance (less than 150 feet) from the area of disturbance. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements. In addition, periodic removal of considerable amounts of debris and sargassum will actually uncover more of the beach and thus allow for more of the beach to be used as foraging area.

2.4.7 Conservation Measures

The USACE intends to condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species. To accomplish this, the City will arrange a yearly training course with either PAIS or the University of Texas Marine Science Institute (UTMSI). The scope of the training will include: 1) Identification of piping plovers; 2) Recognition of plover habitat; 3) Basic procedures for recording piping plover information; 4) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with piping plover training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken in order to allow the City to conduct beach maintenance activities as authorized by the USACE permit, to monitor the effects of beach maintenance activities on piping plovers and their habitat, and to make determinations about potential adjustments to beach maintenance activities in an adaptive fashion on an as-needed basis (See Attachment 2). Parameters to be assessed are beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities. Results of the habitat monitoring effort will be provided in an annual report to USACE by February 1 of each year for a period of 5 years.

2.4.8 Conclusion

The overall conclusion of this Biological Assessment is that the proposed project may affect, but is not likely to adversely affect, the piping plover.

2.5 SLENDER RUSH PEA

2.5.1 Reasons for Status

The slender rush pea *(Hoffmannseggia tenella)* was first proposed as an endangered species on November 21, 1984 and became listed as endangered on November 1, 1985 (50 FR 45614, 45618). The reasons for decline (comments published in the Federal Register, 50 FR 45614, February 25, 1986) identified the loss due to conversion of Gulf Coastal Prairies to agriculture and competition from nonnative grasses (primarily King Ranch bluestem and Bermuda grass) that have been introduced for soil stabilization and pasture improvement. Limited distribution and low population numbers make this species vulnerable to any further disturbance.

2.5.2 Habitat

Slender rush pea grows on calcareous, clayey soils in prairies and creek bands associated with short and midgrasses such as buffalograss, Texas wintergrass (Stipa leucotricha), and Texas grama. Woody plants such as honey mesquite, huisache, huisachillo (Acacia tortuosa), granjeno, brasil (Condalia hookeri), retama, lotebush (Zizyphus obtusifolia), tasajillo (Opuntia leptocaulis), and prickly pear (Opuntia spp.) are also common at the known sites. No critical habitat has been designated for this species.

2.5.3 Range

The slender rush pea, known only to Texas, can be found along the South Texas Gulf coast counties of Kleberg and Nueces (TPWD, 1999c).

2.5.4 Distribution in Texas

The slender rush pea is known from only three or four populations in Kleberg and Nueces counties (TPDW, 1999c).

2.5.5 Presence in the Project Area

This species is unlikely to occur in the project area due to the lack of suitable soils and habitat.

2.5.6 Effects of the Project

No effects to the slender rush pea are anticipated as a result of this project.

2.5.7 Conservation Measures

Because no potential effects to the slender rush pea will occur as a result of the proposed project, no additional conservation measures are needed.

2.5.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the slender rush pea.

2.6 KEMP'S RIDLEY SEA TURTLE

2.6.1 Reasons for Status

Kemp's ridley *(Lepidochelys kempii)* was listed as endangered throughout its range on December 2, 1970 (35 FR 18320). Populations of this species have declined since 1947, when an estimated 42,000 females nested in one day, to a total nesting population of approximately 1,000 in the mid-1980s. The decline of this species was primarily due to human activities including collection of eggs, fishing for juveniles and adults, killing adults for meat and other products, and direct take for indigenous use. In addition to these sources of mortality, Kemp's ridleys have been subject to high levels of incidental take by shrimp trawlers (FWS and NMFS, 1992; NMFS, 2000). The National Research Council's (NRC) Committee on Sea Turtle Conservation estimated in 1990 that 86% of the human-caused deaths of juvenile and adult loggerheads and Kemp's ridleys resulted from shrimp trawling (Campbell, 1995). It is estimated that before the implementation of Turtle Exclusion Devices (TEDs) the commercial shrimp fleet killed between 500 and 5,000 Kemp's ridleys each year (NMFS, 2000). Kemp's ridleys have also been taken by pound nets, gill nets, hook and line, crab traps, and long lines.

Another problem shared by adult and juvenile sea turtles is the ingestion of manmade debris and garbage. Postmortem examinations of sea turtles found stranded on the south Texas coast from 1986 through 1988 revealed 54% (60 of the 111 examined) of the sea turtles had eaten some type of marine debris. Plastic materials were most frequently ingested and included pieces of plastic bags, Styrofoam, plastic pellets, balloons, rope, and fishing line. Non-plastic debris such as glass, tar, and aluminum foil were also ingested by the sea turtles examined. Much of this debris comes from offshore oil rigs, cargo ships, commercial and recreational fishing boats, research vessels, naval ships, and other vessels operating in the Gulf of Mexico. Laws enacted during the late-1980s to regulate this dumping are difficult to enforce over vast expanses of water. In addition to trash, pollution from heavy spills of oil or waste products poses additional threats (Campbell, 1995).

Further threats to this species include collisions with boats, explosives used to remove oil rigs, and entrapment in coastal power plant intake pipes (Campbell, 1995). Dredging operations affect Kemp's ridley sea turtles through incidental take and by degrading the habitat. In addition to direct take, channelization of the inshore and nearshore areas can degrade foraging and migratory habitat through open bay placement of dredged material, degraded water quality/clarity, and altered current flow (FWS and NMFS, 1992).

Sea turtles are especially subject to human impacts during the time the females come ashore for nesting. Modifications to nesting areas can have a devastating effect on sea turtle populations. In many cases, prime sea turtle nesting sites are also prime real estate. If a nesting site has been disturbed or destroyed, female turtles may nest in inferior locations where the hatchlings are less likely to survive, or they may not lay any eggs at all. Artificial lighting from developed beachfront areas often disorients nesting females and hatchling sea turtles, causing them to head inland by mistake, often with fatal results. Adult females also may avoid brightly lit areas that would otherwise provide suitable nesting sites (FWS, 1998). Also of concern are impacts to nesting sites due to vibration, sand compaction, sargassum piles, vehicular ruts and collisions with motor vehicles.

Today, under strict protection, the population appears to be in the early stages of recovery. Approximately 6,000 Kemp's ridley nests were recorded on Mexican beaches during the 2000 nesting season (Shaver, 2000). In 2001, 5,369 Kemp's ridley nests were recorded in Mexico, while in 2002 the number of nests rose to 6,326. As of mid-August 2003, 8,100 nests have been recorded in Mexico (Peña, 2003). More recent counts include approximately 10,000 nests in 2005, 12,000 in 2006, and 15,000 nests in 2007 (Shaver, personal correspondence, 2007). In addition, nesting on Texas beaches also continues to increase with the 2008 count, totaling 195 confirmed nests (Shaver, 2008b). The increase likely can be attributed to two primary factors: full protection of nesting females and their nests in Mexico, and the requirement to use TEDs in shrimp trawlers both in the U.S. and in Mexico (NMFS, 2000).

2.6.2 Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, although rarely in bays, usually over sand or mud bottoms. Adults are primarily shallow-water benthic feeders that specialize on crabs, especially portunid crabs, while juveniles feed on sargassum and associated infauna, and other epipelagic species of the Gulf of Mexico (FWS and NMFS, 1992). In some regions the blue crab *(Callinectes sapidus)* is the most common food item of adults and juveniles. Other food items include shrimp, snails, bivalves, sea urchins, jellyfish, sea stars, fish, and occasional marine plants (Pritchard and Marquez, 1973; Shaver, 1991; Campbell, 1995).

2.6.3 Range

Adults are primarily restricted to the Gulf of Mexico, although juveniles may range throughout the Atlantic Ocean since they have been observed as far north as Nova Scotia (Musick, 1979) and in coastal waters of Europe (Brongersma, 1972). Important foraging areas include Campeche Bay, Mexico, and Louisiana coastal waters.

The majority of Kemp's ridleys nest on an 11-mile stretch of coastline near Rancho Nuevo, Tamaulipas, Mexico, approximately 190 miles south of the Rio Grande. A secondary nesting area occurs at Tuxpan, Veracruz. Nesting has been documented from approximately 134 miles of the Tamaulipas coastline, and sporadic nesting has been reported from Bolivar Peninsula, Texas, southward to Isla Aquada, Campeche. There have been several isolated nesting attempts scattered from North Carolina to Colombia.

Because of the dangerous population decline at the time, a head-starting program was carried out from 1978 to 1988. Eggs were collected from Rancho Nuevo and placed into polystyrene foam boxes containing Padre Island sand so that the eggs never touched Rancho Nuevo sand. The eggs were flown to the U.S. and placed in a hatchery on Padre Island and incubated. The resulting hatchlings were allowed to crawl over the Padre Island beaches into the surf for imprinting purposes before being recovered from the surf and taken to Galveston for rearing. They were fed a diet of high-protein commercial floating pellets for 7 to 15 months before being released into Texas (mainly) or Florida waters (Caillouet et al., 1993). This program has shown some results. The first nesting from one of these head started individuals occurred at Padre Island in 1996 and more nestings have occurred since (Shaver, 2000). A continuing program is still ongoing. Eggs from sea turtle nests found at Padre Island National Seashore and northward along the Texas coast are transported to the National Seashore's sea turtle incubation facility for protected care and monitoring. The hatchlings from the eggs are released at the northern end of Padre Island National Seashore when they emerge from their eggshells and become active (NPS, 2007).

2.6.4 Distribution in Texas

Kemp's ridley turtles occur in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. Additionally, there appear to be a population of Kemp's ridley turtles which remain in the northern gulf for longer periods of time. Females nesting on the Texas coast are remaining resident here offshore during the nesting season and to some extent later, according to turtles recently outfitted with radio receivers; one prior to 2006 and one in 2007 (Orms, 2008). Additionally, one of the males previously tracked in Mexican waters traveled to waters off the Texas coast. Studies also show that juvenile turtles use Texas areas extensively for foraging.

Kemp's ridley turtles have nested sporadically in Texas in the last 50 years and total number of nests has increased over the last decade. Nests were found near Yarborough Pass in 1948 and 1950, and in 1960 a single nest was located at Port Aransas. From 1979 to 2008, 722 sea turtle nests were found on the Texas coast. Of the 722 nests, 649 were Kemp's ridley nests, 361 of which were found on PAIS (Shaver, 2008). In 1999, 16 confirmed Kemp's ridley nests were recorded in Texas, 12 nests were confirmed for 2000, 8 for 2001, 38 for 2002, 19 for 2003, 42 for 2004, 51 for 2005, and 102 for 2006 (PAIS data). For the 2008 nesting season, there have been a total of 195 confirmed nests. Several of the ridley nests were from head-started individuals. Such nestings, together with the proximity of the Rancho Nuevo breeding ground, probably accounts for the occurrence of hatchlings and subadults in Texas. According to Hildebrand (1982, 1986, 1987), sporadic ridley nesting in Texas has always been the case. This is in direct contradiction, however, to Lund (1974), who believed that Padre Island historically supported large numbers of nesting Kemp's ridleys, but that the population became extirpated because of excessive egg collection. Kemp's ridleys have been observed mating in the Mansfield Channel and, thus, could potentially mate in the nearby Laguna Madre and Gulf of Mexico.

2.6.5 Presence in the Project Area

In south Texas, Kemp's ridley turtles have been recorded in Willacy County, as well as in Nueces, Kleberg, Kenedy and Cameron counties (Dixon, 2000). Thus, this species could potential occur in the project area. During the 2006 nesting season, a total of 102 Kemp's ridley nests were documented along the Texas coast (NPS 2006), 128 during the 2007 nesting season (NPS, 2007), and 195 during the 2008 nesting season (Shaver, 2008). Kemp's ridley turtles are the only species to have nested in the proposed project area over the last five years; nest totals for the proposed project area are as follows (Shaver, 2008):

Year	# Kemp's Ridley Nests
1997	1
1998	1
1999	2
2000	0
2001	1
2002	0
2003	0
2004	1
2005	1
2006	0
2007	3
2008	3

2.6.6 Effects of the Project

The following discussion will be referenced for all sea turtles included in this BA. Section 7 consultation with NMFS concluded in their concurrence that endangered and threatened turtles in the aquatic environment will not be affected by this project. Activities will generally be carried out above the MHT, rather than in the water, and will therefore not significantly affect any aquatic environment.

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be directly vulnerable to the heavy machinery associated with beach maintenance activities. In addition, those activities could interfere with and/or prevent some turtles from attempting to nest. Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann, 1977; NMFS and U.S. Fish and Wildlife Service, 1991a, 1991b, 1992, 1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it difficult to find possible nests for protection. Ruts from vehicles can trap hatchlings and smaller stranded turtles and may result in death (Hosier et al., 1981; Fletemeyer, 1996, Ernest et al., 1998). Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer, 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Data is not available on the degree that compaction, resulting from vehicle use on the beach, either prevents or reduces nesting success.

Vibrations and noise caused by moving vehicles on the beach during beach maintenance operations could frighten nesting turtles, causing them to abandon their nesting attempt (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Vibrations could also harm incubating eggs. It is difficult to assess this possible impact since scientific data is lacking for the Kemp's ridley turtles' sensitivity to traffic vibrations or noise. Vibrations could affect sea turtles either during nest site selection after exiting the water or once the eggs are laid. Vibrations could cause sea turtles to abandon a nesting attempt resulting in a false crawl and causing a sea turtle to re-enter the water and nest in another location. Information suggests that turtles do not respond to vibrations once egg-laying has begun.

Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Regular beach maintenance removes debris, including non-natural items (e.g. plastics, beach chairs, old buoys) and large natural objects (e.g. tree trunks and sargassum), both of which wash ashore in large quantities and both of which can impede or prevent turtle nesting. At times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to four feet in height and 10 to 20 feet in width. The removal of this material, as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier and by providing a smooth crawlway.

Beach maintenance has the potential to kill emerging hatchling turtles from in situ nests not previously discovered by patrols. The hatchlings may be caught in seaweed which will be scraped up and either mounded or buried. While this is a potential effect of the project, it is not possible to quantify the potential impacts that may result from beach maintenance programs. USFWS states that turtle mortalities may also result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.6.7 Conservation Measures

This project may potentially impact Kemp's ridley turtles if they are present in the project area during beach maintenance activities. However, conservation measures and monitoring of beach maintenance activities by trained City employees and volunteers affiliated with the University of Texas Marine Science Institute (UTMSI) will help decrease the likelihood of impacts.

The USACE intends to condition any permit issued to the City for this work to include provisions that require the City to do the following:

(1) Annual Sea Turtle Monitoring Plan

Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the Corps of engineers for approval. This plan shall contain information on how the City will ensure compliance with the conservation measures for sea turtles as defined in this section. In addition, an annual follow-up report will be presented to the Corps prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

The City will provide a financial award to any City beach maintenance employee who successfully identifies a turtle nest.

All turtles, turtle nests, or turtle eggs found by monitors or maintenance personnel will be safe-guarded by City staff until they can be relocated by appropriate authorities.

(2) Turtle Patrols

The City will ensure that daily patrols are carried out from 15 March to 1 October for the entire 7-mile stretch of beach within the project area, beginning at 6:30 am and ending at 6:30 pm. UTMSI will conduct volunteer turtle patrols daily from 15 March to 30 June, beginning around 6:30 am and concluding around 2:00 pm. The UTMSI patrols will extend from the south from the south jetty at Aransas Pass Inlet past the southern border of the City of Port Aransas (approximately 7 miles, including the entire proposed project area. Trained City staff will monitor this stretch of beach beginning at 2:00 pm, when the UTMSI volunteers conclude their patrols, and will continue until 6:30 pm. In the event that there is a lapse in volunteer coverage, the volunteer coordinator at UTMSI will notify City staff so that they may reassign personnel to cover for the absent volunteer.

(3) Training

The City will require all personnel involved in beach maintenance activities to receive training each year, prior to their involvement in cleaning activities. The scope of the training will include: 1) Identification of different turtle species; 2) Recognition of turtle tracks or crawls; 3) Basic procedures for recording turtle information if turtle returns to the water prior to the arrival of the turtle patrol team; 4) Protection of nest areas, 5) Contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will also be arranged with either PAIS or UTMSI volunteer representative, or with the Service.

(4) Maintenance

No maintenance equipment shall enter a work area until an initial survey has been performed and they are notified by the monitor that it is clear to proceed. Initial surveys may be done by the monitor with the equipment prior to commencing work from 15 March to 30 March and again from 1 July to 30 September. Initial surveys from 1 April to 30 June should be completed by UTMSI as part of their annual volunteer turtle patrol activities.

If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the sighting location, and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence within 100 feet of the nest site until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. The City has stated that its staff will honor this commitment to cease maintenance activities within 100 feet of the nest site for a period no greater than 3 hours. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City has stated that its staff will flag the nest area and recommence work, making sure that the nest site is avoided.

All ruts and berms created by City equipment engaged in beach maintenance activities will be smoothed out to a target height of 2 inches (5.08 centimeters) or less so that turtle tracks can be better identified and to prevent small turtles from becoming entrapped. If need be, City staff will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement it if found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time the practice is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

Mechanical beach cleaning equipment shall attempt to limit penetration into the surface of the beach to depths of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment..

USACE will require the City to have a trained City-staff monitor or supervisor on-site when beach maintenance equipment is being used during the peak turtle nesting season from 15 March – 30 July.

The City will implement a monitoring plan requested by the USACE and coordinated with the Service.

If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredune.

The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m. If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (60.9 meters) to allow turtles to traverse these areas.

During beach maintenance activities, equipment will be driven above the "wet line" on the beach to more easily identify sea turtle tracks and minimize disturbance of birds.

The City will be allowed to build an approximately 20-foot wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be preset in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where berms are in place, they will attempt to create an unrestricted passage for the turtle by smoothing out the berm with a shovel or tool. As specified in other sections of this document, the proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest. The piles of sand, and the sculptures made from them, will be spaced so as to allow ample open beach for use by any nesting turtles. The sculptures and mounded sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

5) Education

The city will ensure that public education signs are posted at strategic locations in the project area. Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at PAIS. These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle sighting occurs.

(6) Notification

In the event a take occurs, the City will immediately notify both the USACE, Corpus Christi Regulatory Office and the US Fish & Wildlife Service Corpus Christi Field Office. From the time that a take occurs until 15 July of that calendar year the City will be required to have a monitor present with each work crew, while machinery is in operation.

(7) Annual Sea Turtle Report

A Sea Turtle Annual Report will be provided to the USACE by 1 February of each year. This report will include:

1. Summary of the number of turtles and turtle nests found that year by species
2. Map depicting the location of each nest
3. Number of takes, if any, by species
4. Summary of measures implemented during the project activities, relative success of those measures, and any recommendations for improving those measures

2.6.8 Conclusion

Despite an increase in nesting turtles within the project area, the risk to a Kemp's ridley sea turtle within the project area is still considered limited and will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. However, despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.7 HAWKSBILL SEA TURTLE

2.7.1 Reasons for Status

The hawksbill sea turtle *(Eretmochelys imbricata)* was Federally listed as endangered on June 2, 1970 (35 FR 8495), with critical habitat designated in Puerto Rico on May 24, 1978 (43 FR 22224). The greatest threat to this species is harvest to supply the market for tortoiseshell and stuffed turtle curios (Meylan and Donnelly, 1999). Hawksbill shell (bekko) commands high prices (recently $225/kilogram (kg)). Japanese imports of raw hawksbill shell (bekko) between 1970 and 1989 totaled 713,850 kg, representing more than 670,000 turtles. The hawksbill is also used in the manufacture of leather, oil, perfume, and cosmetics (NMFS, 2000).

2.7.2 Habitat

Hawksbills generally inhabit coastal reefs, bays, rocky areas, passes, estuaries, and lagoons, where they are typically found at depths of less than 70 feet. Like some other sea turtle species, hatchlings are sometimes found floating in masses of marine plants (e.g., sargassum rafts) in the open ocean (NFWL, 1980). Hawksbills reenter coastal waters when they reach a carapace length of approximately 8 to 10 inches. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults, and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. In Texas, juvenile hawksbills are associated with stone jetties (NMFS, 2000).

While this species is omnivorous, it prefers invertebrates, especially encrusting organisms, such as sponges, tunicates, bryozoans, mollusks, corals, barnacles, and sea urchins. Pelagic species consumed include jellyfish, fish, and plant material such as algae, submerged aquatic vegetation (SAV) and mangroves, which also have been reported as food items for this turtle (Carr, 1952; Rebel, 1974; Pritchard, 1977; Musick, 1979; Mortimer, 1982). The young are reported to be somewhat more herbivorous than the adults (Ernst and Barbour, 1972).

Terrestrial habitat is typically limited to nesting activities. They nest on undisturbed, deep-sand beaches, from high-energy ocean beaches to tiny pocket beaches several meters wide bounded by crevices of cliff walls. Typically, these sand beaches are low energy with woody vegetation, such as sea grape *(Coccoloba uvifera),* near the waterline (NRC, 1990). The hawksbill is typically a solitary nester, which makes it harder to monitor nesting activity and success (NMFS, 2000).

2.7.3 Range

The hawksbill is circum-tropical, occurring in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans (Witzell, 1983). This species is probably the most tropical of all marine turtles, although it does occur in many temperate regions. The hawksbill turtle is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas), south to Brazil (NMFS, 2000). In the continental U.S., the hawksbill nests only in Florida where it is sporadic at best (NFWL, 1980). However, a major nesting beach exists on Mona Island, Puerto Rico. Elsewhere in the western Atlantic, hawksbills nest in small numbers along the Gulf coast of Mexico, the West Indies, and along the Caribbean coasts of Central and South America (Musick, 1979).

2.7.4 Distribution in Texas

Texas is the only state outside of Florida where hawksbills are sighted with any regularity. Most of these sightings involve post-hatchlings and juveniles, and sightings are primarily associated with stone jetties. Some are found washed ashore on south Texas Gulf beaches entangled in onion sacks or in association with large amounts of sargassum (Shaver, 2008). These small turtles are believed to originate from nesting beaches in Mexico (NMFS, 2000).

2.7.5 Presence in the Project Area

The hawksbill has been recorded from Nueces, Kleberg, Willacy, and Cameron counties (Dixon, 2000). Although unlikely, it is of potential occurrence in the project area. On June 13, 1998 the first hawksbill nest recorded on the Texas coast was found outside the project area at Padre Island National Seashore (Shaver, 1998). It contained 140 eggs of which 133 hatched and 132 were released into the Gulf (one weak hatchling was taken to a rehabilitation facility). This nest remains the only example documented on the Texas coast.

2.7.6 Effects of the Project

Because most of the sightings of the hawksbill sea turtle in the northern Gulf of Mexico occur at stone jetties, this species could occur near the stone jetty at Aransas Pass Inlet, just north of the project area. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.7.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.7.8 Conclusion

For the reasons cited in Section 2.7.6, the risk to a hawksbill sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the hawksbill sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the hawksbill sea turtle.

2.8 LEATHERBACK SEA TURTLE

2.8.1 Reasons for Status

The leatherback turtle *(Dermochelys coriacea)* was listed as endangered throughout its range on June 2, 1970 (35 FR 8495), with critical habitat designated in the U.S. Virgin Islands on September 26, 1978 and March 23, 1979 (43 FR 43688—43689 and 44 FR 17710—17712, respectively). Its decline is attributable to overexploitation by man and incidental mortality associated with commercial shrimping and fishing activities. Use of turtle meat for fish bait and the consumption of litter by turtles have also been mentioned as causes for mortality, the latter phenomenon apparently occurring when plastic is mistaken for jellyfish (Rebel, 1974). Although nesting populations of leatherback sea turtles are especially difficult to discern because the females frequently change nesting beaches, current estimates are that 20,000 to 30,000 female leatherbacks exist worldwide. The major threat is egg collecting, although they are also jeopardized to some extent by destruction or degradation of nesting habitat (NatureServe, 2000). Egg collecting is not currently a problem in Florida, but remains a problem in Puerto Rico and the U.S. Virgin Islands (NMFS and FWS, 1992). This species is probably more susceptible than other turtles to drowning in shrimp trawlers equipped with turtle excluder devices (TEDs) because adult leatherbacks are too large to pass through the TED exit opening. While the TED exit opening size has been increased in the U.S., USFWS is unsure whether it has been increased in other countries. Because leatherbacks nest in the tropics during hurricane season, a potential exists for storm-generated waves and wind to erode nesting beaches, resulting in nest loss (NMFS and FWS, 1992).

2.8.2 Habitat

The leatherback turtle is mainly pelagic, inhabiting the open ocean, and seldom approaches land except for nesting (Eckert, 1992). It is most often found in coastal waters when nesting or following concentrations of jellyfish (TPWD, 2000), during which it can be found in inshore waters, bays, and estuaries. It dives almost continuously, often to great depths.

Despite their large size, the diet of leatherbacks consists largely of jellyfish and sea squirts. They also consume sea urchins, squid, crustaceans, fish, blue-green algae, and floating seaweed

(NFWL, 1980). The leatherback typically nests on beaches with a deepwater approach (Pritchard, 1971). No critical habitat has been designated within the project area.

2.8.3 Range

The leatherback is probably the most wide-ranging of all sea turtle species. It is found in the Atlantic, Pacific and Indian oceans and occurs as far north as British Columbia, Newfoundland, Great Britain and Norway, as far south as Australia, Cape of Good Hope, and Argentina, and in other water bodies such as the Mediterranean Sea (NFWL, 1980). Leatherbacks nest primarily in tropical regions and major nesting beaches include Malaysia, Mexico, French Guiana, Surinam, Costa Rica, and Trinidad (Ross, 1982). Leatherbacks nest only sporadically in some of the Atlantic and Gulf states of the continental U.S., with one nesting reported as far north as North Carolina (Schwartz, 1976). In the Atlantic and Caribbean, the largest nesting assemblages are found in the U.S. Virgin Islands, Puerto Rico, and Florida (NMFS, 2000).

The leatherback migrates further and ventures further into colder water than any other marine reptile. Adults appear to engage in routine migrations between boreal, temperate, and tropical waters, presumably to optimize both foraging and nesting opportunities. The longest-known movement is that of an adult female that traveled 3,666 miles to Ghana, West Africa, after nesting in Surinam (NMFS and FWS, 1992). During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

2.8.4 Distribution in Texas

According to FWS (1981), leatherbacks have never been common in Texas waters. Leatherback turtles tend to keep to deeper offshore waters where their primary food source, jellyfish, occurs. In the Gulf of Mexico, the leatherback is often associated with two species of jellyfish, the cabbagehead (*Stomolophus* sp.) and the moon jellyfish (*Aurelia* sp.) (NMFS and FWS, 1992). Leatherback turtle feeding aggregations—large occurrences of 100 turtles—were reported by Leary (1957) off Port Aransas in December 1956 and in the Brownsville Eddy in winter (Hildebrand, 1983). A leatherback turtle nest was found at Padre Island National Seashore on June 6, 2008; however, none of the eggs hatched (Shaver, 2008). Prior to this, no nests of this species have been recorded on Texas beaches for over 60 years. The last two reported, one from the late 1920s and one from the mid-1930s, were both from Padre Island (Hildebrand, 1982, 1986). Stranding records report 1 leatherback on the Texas coast in 2006 and 1 in 2007 (Orms, 2007).

2.8.5 Presence in the Project Area

The leatherback has been recorded from Nueces, Kenedy, and Cameron counties (Dixon, 2000). Although highly unlikely, the potential exists for this species to occur in the project area.

2.8.6 Effects of the Project

Of the five species of sea turtles occurring in Texas waters, the leatherback is the species least likely to be affected by the proposed project because of its rare occurrence on Texas beaches and its pelagic nature. No effects to this species are anticipated as a result of the project.

2.8.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.8.8 Conclusion

For the reasons cited in Section 2.8.6, the risk to a leatherback sea turtle in this project area is considered very limited, and the risk of interaction will be further reduced through the conservation measures undertaken both before and during beach maintenance activities. Through these measures potential adverse affects to the leatherback sea turtle will be insignificant. The overall conclusion of this BA is that the proposed project may affect, but is not likely to adversely affect, the existence of the leatherback sea turtle.

2.9 GREEN SEA TURTLE

2.9.1 Reasons for Status

The green sea turtle *(Chelonia mydas)* was listed on July 28, 1978 as threatened except for Florida and the Pacific coast of Mexico (including the Gulf of California), where it was listed as endangered (43 FR 32808). The greatest cause of decline in green sea turtle populations is commercial harvest for eggs and food. Other turtle parts are used for leather and jewelry, and small turtles are sometimes stuffed for curios. Incidental catch during commercial shrimp trawling is a continued source of mortality that adversely affects recovery. It is estimated that before the implementation of TED requirements, the offshore commercial shrimp fleet captured about 925 green sea turtles a year, of which approximately 225 would die. Most turtles killed are juveniles and subadults. Various other fishing operations also negatively impact this species (NMFS, 2000). Epidemic outbreaks of fibropapilloma or "tumor" infections recently have occurred on green sea turtles, especially in Hawaii and Florida, posing a severe threat. The cause of these outbreaks is largely unknown, but it could be caused by a viral infection (Barrett, 1996). Some scientists suspect this disease to be linked to environmental alteration of sea turtle habitat by pollution and contaminants (FWS, 1998). This species is also subject to various negative impacts shared by sea turtles in general. According to Donna Shaver, an additional significant threat to the green sea turtle's survival is hypothermic stunning (Orms, 2008).

2.9.2 Habitat

The green sea turtle primarily utilizes shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and submerged aquatic vegetation (SAV). Individuals observed in the open ocean are believed to be migrants en route to feeding grounds or nesting beaches (Meylan, 1982). Hatchlings often float in masses of sea plants (e.g., sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. Adults are primarily herbivorous, while juveniles consume more invertebrates. Principal food items include SAV, macroalgae and other marine plants, mollusks, sponges, crustaceans, and jellyfish (Mortimer, 1982; Green, unpubl. data).

Terrestrial habitat is typically limited to nesting activities, although in some areas, such as Hawaii and the Galapagos Islands, green sea turtles have been observed basking on beaches (Balazs, 1980; Green, unpubl. data). They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. At least in some regions, they generally nest consistently at the same beach, which is apparently their natal beach (Meylan et al., 1990; Allard et al., 1994), although an individual might switch to a different nesting beach within a single nesting season (Green, unpubl. data).

2.9.3 Range

The green sea turtle is a circum-global species in tropical and sub-tropical waters. In U.S. Atlantic waters, it is found around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Ayes Island (Venezuela), Costa Rica, and in Surinam. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NMFS and FWS, 1991b; Hirth, 1997). Nesting numbers are increasing rapidly in Florida and Mexico (Orms, 2008).

2.9.4 Distribution in Texas

The green sea turtle in Texas inhabits shallow bays, rock passes, and estuaries where its principal foods, the various marine grasses and other SAV, grow (Bartlett and Bartlett, 1999). Its population in Texas has suffered a decline similar to that of its world population. In the mid to late nineteenth century, Texas waters supported a green sea turtle fishery. Most of the turtles were caught in Matagorda Bay, Aransas Bay, and the Lower Laguna Madre, although a few also came from Galveston Bay. They have also been documented in large numbers at Packery, Mansfield and Brazos Santiago Pass and observed at Fish Pass and at the Port Aransas Jetties (Orms, 2008). Many live turtles were shipped to places such as New Orleans or New York and from there to other areas. Others were processed into canned products such as meat or soup prior to shipment. By 1900, however, the fishery had virtually ceased to exist. Turtles continued to be hunted sporadically for a while, with the last Texas turtler hanging up his nets in 1935. Incidental catches by fisherman and shrimpers were sometimes marked prior to 1963, when it became illegal to do so (Hildebrand, 1982).

Reduced numbers of green sea turtles can still be found in these same bays today (Hildebrand, 1982). Although numbers of green turtles are much reduced over historic figures, their numbers are now starting to increase. While green sea turtles prefer to inhabit bays with SAV meadows, they may also be found in bays that are devoid of SAV. The green sea turtles in these Texas bays are mainly small juveniles. Adults, juveniles, and even hatchlings are occasionally caught on trotlines or by offshore shrimpers or are washed ashore in a moribund condition.

Juvenile green turtles are being reported in increasing numbers from surf waters of the Gulf of Mexico. Increasing numbers are also being found washed ashore on south Texas Gulf beaches in association with large amounts of sargassum (Shaver, 2008).

Green sea turtle nests are rare in Texas. Of the 722 turtle nests found on the Texas coast between 1979 and 2008, 26 were green sea turtle nests, all of which were found outside the project area on PAIS and one on South Padre Island. This includes five in 2008 outside the project area including four within PAIS and one on South Padre Island (Shaver, 2008). Three nests were found in 2007, two within PAIS and one on South Padre Island. Also included (all at PAIS) are two in 2006, 4 in 2005, 1 in 2004, 2 in 2003, 2 in 2002, and 1 in 2000. Observed juveniles are likely from Mexico and may return there to nest. There is a possibility that increased nesting of these juveniles in Texas could occur (Orms, 2008).

2.9.5 Presence in the Project Area

The green sea turtle has been recorded from Nueces, Kleberg, Kenedy, Willacy and Cameron counties (Dixon, 2000). There is potential for this species to occur in the project area, but individuals are most likely to be in transit through Aransas Pass Inlet en route to the back bays west of the project area. In Texas (Shaver, 2000, unpublished data), green sea turtle nests have only been documented at PAIS, south of the project area.

2.9.6 Effects of the Project

Because most of the sightings of the green sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the proposed project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities may impact nesting green sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.9.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.9.8 Conclusion

For the reasons cited in Section 2.9.7, the risk to green sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.10 LOGGERHEAD SEA TURTLE

2.10.1 Reasons for Status

The loggerhead sea turtle *(Caretta caretta)* was listed as threatened throughout its range on July 28, 1978 (43 FR 32808). The decline of the loggerhead, like that of most sea turtles, can be attributed to overexploitation by man, inadvertent mortality associated with fishing and trawling activities, and natural predatation. The most significant threats to its population are coastal development, commercial fisheries, and pollution (NMFS, 2000).

2.10.2 Habitat

The loggerhead is found in the open seas as far as 500 miles from shore, but mainly over the continental shelf, and in bays, estuaries, lagoons, creeks, and mouths of rivers. It favors warm temperate and sub-tropical regions not far from shorelines. The adults occupy various habitats, from turbid bays to clear waters of reefs. Subadults occur mainly in nearshore and estuarine waters. Hatchlings move directly to sea after hatching, and often float in masses of sargassum. They may remain associated with sargassum for 3 to 5 years (NMFS and FWS, 1991b).

Commensurate with their use of varied habitats, loggerheads consume a wide variety of both benthic and pelagic food items, which they crush before swallowing. Conch, shellfish, horseshoe crabs, prawns and other crustacea, squid, sponges, jellyfish, basket stars, fish (carrion or slow-moving species), and even hatchling loggerheads have all been recorded as loggerhead prey (Rebel, 1974; Hughes, 1974; Mortimer, 1982). Adults forage primarily on the bottom, but also take jellyfish from the surface. The young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

Nesting occurs usually on open, sandy beaches above high-tide mark and seaward of well developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and sub-tropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al., 1995). No critical habitat has been designated for this species.

2.10.3 Range

The loggerhead is widely distributed in tropical and subtropical seas, being found in the Atlantic Ocean from Nova Scotia to Argentina, Gulf of Mexico, Indian and Pacific oceans (although it is rare in the eastern and central Pacific), and the Mediterranean Sea (Rebel, 1974; Ross, 1982; Iverson, 1986). In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick, 1979) and sporadically along the Gulf coast. In recent years, a few have nested on barrier islands along the Texas coast.

2.10.4 Distribution in Texas

The loggerhead is considered to be the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters and occurring only very infrequently in the bays. It is also the species most commonly sighted around offshore oil rig platforms and reefs and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when one of their food items, the Portuguese man-of-war, is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year. A large proportion of these deaths are due to the activities of shrimp trawlers where turtles are accidentally caught in the nets and drown and their bodies dumped overboard. Prior to 1977, no positive documentation of loggerhead nests in Texas existed (Hildebrand, 1982). Since that time, several nests have been recorded along the Texas coast. In 1999, two loggerhead nests were confirmed in Texas, five were confirmed in 2000, three in 2001, one in 2002, two in 2006, 5 in 2007, and 3 in 2008 (Shaver, 2000, 2002, 2007, 2008). Like the worldwide population, the population of loggerheads in Texas has declined. Prior to World War I, the species was taken in Texas for local consumption and a few were marketed (Hildebrand, 1982). Today, even with protection, insufficient loggerheads exist to support a fishery.

2.10.5 Presence in the Project Area

The loggerhead has been recorded in Nueces County and in Kleberg County (Dixon, 2000) and in Corpus Christi Bay (Shaver, 2000). There is potential for this species to occur in the project area. Of the 722 sea turtle nests found on the Texas coast between 1979 and July 2008, 46 were loggerhead sea turtle nests, of which 33 were found on PAIS. During the last decade, nesting has remained stable on the Texas coast at 1-5 nests per year, the majority of which occur on the Padre Island National Seashore, south of the project area.

2.10.6 Effects of the Project

Because most of the sightings of the loggerhead sea turtle in the northern Gulf of Mexico occur near jettied passes, this species could occur near the stone jetty associated with Aransas Pass Inlet, just north of the project area. Given the possible, but unlikely, occurrence of this species nesting within the project area, beach maintenance activities could impact nesting loggerheads sea turtles. USFWS states that turtle mortalities may result from post-hatchlings and juvenile turtles getting trapped as washbacks in the washed up sargassum (Orms, 2008; Shaver, 2008), a naturally occurring phenomenon. No data has been identified to suggest the extent or possible form of mortality. It is possible that a take may occur from operating in the sargassum areas where turtles may be trapped; it is also possible that regular maintenance, coupled with regular monitoring of the beach may reduce turtle mortalities that result from entrapment in the seaweed.

2.10.7 Conservation Measures

The conservation measures employed for the Kemp's ridley sea turtle will also be employed for this species (Section 2.6.7, above). In the event that a turtle is discovered entangled in sargassum, the notification process and work procedure as described in Section 2.6.7(4), paragraph 2, of this document will be followed.

2.10.8 Conclusion

For the reasons cited in Section 2.10.6, the risk to loggerhead sea turtles in this project area is considered very limited, and the likelihood of impacts will be minimized by monitoring and conservation measures undertaken before and during beach maintenance activities. Despite the incorporation of ample preventative measures into the permit to reduce the risk of death or injury to turtles, there is no way to eliminate all risks associated with the proposed activities. The overall conclusion of this BA is that the proposed project may affect, and is likely to adversely affect, this species.

2.11 SOUTH TEXAS AMBROSIA

2.11.1 Reasons for Status

The South Texas Ambrosia became listed as endangered on September 23, 1994 (50 CFR Part 17). Loss of habitat has led to the decline of this species. Conversion of habitat to agricultural fields and urban areas has limited the amount of habitat available for colonization. In addition, introduced species such as buffelgrass *(Cenchrus ciliaris)* and King Ranch bluestem *(Bothriochloa ischaemum var. songaricus)* compete with this and other natives of the coastal prairie. Invasion of prairie by shrub and tree species also contributes to loss of available habitat, although the species does occur among scattered woody plants. Disturbance associated with activities occurring along road right-of-ways where the species is found may also be detrimental.

2.11.2 Habitat

South Texas ambrosia grows and blooms at low elevations in open clay-loam prairies and savannas among *Ayenia limitaris*, *Buchloe dactyloides*, *Stipa leucotricha* and *Bouteloua rigidiseta*. South Texas ambrosia was first collected in San Fernando, Tamaulipas, Mexico, by Luis Berlandier in 1835. The first U.S. collection was made by Robert Runyon in 1932 in Cameron County, Texas. It has since been found in Cameron, Jim Wells, Kleberg and Nueces Counties in South Texas. Six populations are known to exist in Nueces and Kleberg counties. No critical habitat has been designated for this species.

2.11.3 Range

South Texas ambrosia is known only from the southern tip of Texas and from Tamaulipas, Mexico (Correll and Johnston, 1970; Turner, 1983). It was first collected by J.L. Berlandier in San Fernando, Tamaulipas, Mexico in 1835 (Turner, 1983), but it was not until 1859 that Gray described this species as new to science. Historically, South Texas ambrosia was known only from Kleberg, Nueces, Jim Wells, and Cameron counties in the Gulf Prairie region of Texas and Tamaulipas in Mexico. The status of the Mexican populations is unknown.

2.11.4 Distribution in Texas

This species has been historically reported from Jim Wells and Cameron counties, although it is currently verified in six general locations in Nueces and Kleberg counties (TPWD, 1999a).

2.11.5 Presence in the Project Area

The South Texas Ambrosia is limited to coastal prairies with clayey soil and therefore would not be found in the project area, which is located totally on a sandy beach.

2.11.6 Effects of the Project

No effects to the South Texas Ambrosia are anticipated as a result of this project.

2.11.7 Conservation Measures

Because no potential effects to the South Texas Ambrosia will occur as a result of the proposed project, no additional conservation measures are needed.

2.11.8 Conclusion

Based on this information, it is the conclusion of this Biological Assessment that the proposed project will have no effect on the South Texas Ambrosia.

2.12 WEST INDIAN MANATEE

2.12.1 Reasons for Status

The West Indian manatee *(Trichechus manatus)* was listed as endangered on June 2, 1970 (35 FR 8495). The largest known human-related cause of manatee mortality in Florida is collisions with hulls and/or propellers of boats and ships. The second-largest human-related cause of mortality in Florida is entrapment in floodgates and navigation locks. Other known causes of human-related manatee mortality include poaching and vandalism, entrapment in shrimp nets and other fishing gear, entrapment in water pipes, and ingestion of marine debris (FWS, 1993). Hunting and fishing pressures were responsible for much of its original decline, as manatees were heavily hunted for meat, hides, and bones until they were nearly extirpated (FWS, 1995a).

A prominent cause of natural mortality in some years in Florida is cold stress. Major die-offs associated with the outbreaks of red tide have occurred, where manatees appear to have died due to ingestion of filter-feeding tunicates (incidentally ingested by manatees feeding on seagrasses) that had accumulated the neurotoxin-producing dynoflagellates responsible for causing the red tide (FWS, 1993; 1995b). The low reproductive rate and habitat loss make it difficult for manatee populations to recover.

2.12.2 Habitat

The manatee inhabits shallow coastal waters, estuaries, bays, rivers, and lakes. Throughout most of its range it appears to prefer rivers and estuaries to marine habitats, although manatees inhabit marine habitats in the Greater Antilles (Lefebvre et al., 1989). It is not averse to traveling through dredged canals or using quiet marinas. Manatees are apparently not able to tolerate prolonged exposure to water colder than 20°C. In the northern portions of their range during October through April they congregate in warmer water bodies, such as spring-fed rivers and outfalls from power plants. They prefer waters that are at least 3.3 to 6.6 feet in depth; along coasts they are often in water 9.9 to 16.5 feet deep. They usually avoid areas with strong currents (NatureServe, 2000).

Manatees are primarily dependent upon submergent, emergent, and floating vegetation, with the diet varying according to plant availability. They may opportunistically eat other foods such as acorns in early winter in Florida or fish caught in gill nets in Jamaica (O'Shea and Ludlow, 1992).

2.12.3 Range

The manatee ranges from the southeastern U.S. and coastal regions of the Gulf of Mexico, through the West Indies and Caribbean, to northern South America. United States populations occur primarily in Florida (NatureServe, 2000), where they are effectively isolated from other populations by the cooler waters of the northern Gulf of Mexico and the deeper waters of the Straits of Florida (Domning and Hayek, 1986).

2.12.4 Distribution in Texas

Manatees are extremely rare in Texas, although in the late 1800s they apparently were not uncommon in the Laguna Madre. Recent Texas records also include specimens from Cameron, Willacy, Galveston, and Matagorda counties (FWS, 1995a); Davis and Schmidly (1994) describe a Texas record of a manatee found dead in the surf near Bolivar Peninsula near Galveston in 1986. Manatees may travel great distances (200 km or more) along the coast or between islands (FWS, 1995a). In the Corpus Christi Bay area, a manatee was sighted at Fish Pass on October 2, 1979 and another near the Naval Air Station in October and November 1995 (Price-May, 2002). Albert Oswald of the Texas State Aquarium spotted a manatee in the inlet between the Texas State Aquarium and the Lexington Museum on September 23, 2001. This is the third and probably most reliable sighting of the manatee in Corpus Christi Bay (Beaver, 2001). More recently in 2005, a manatee was spotted throughout the month of May in the Port Mansfield Harbor (KGBT Channel 4, 2005) and April 2006 (Wilson, 2006).

2.12.5 Presence in the Project Area

The manatee has been spotted in the Corpus Christi Bay area, and though highly unlikely, may access waters adjacent to the project area by way of Aransas Pass Inlet.

2.12.6 Effects of the Project

While the West Indian manatee has been recently sighted in back bay habitats to the southwest of the project area, such occurrences are extremely rare, and the likelihood that any individuals would end up in the waters adjacent to proposed project area is extremely unlikely. Regardless, the proposed activities will not affect aquatic habitats and thus have no potential to affect the West Indian manatee.

2.12.7 Conservation Measures

Because no potential effects to the West Indian manatee are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.12.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the West Indian manatee.

2.13 WHOOPING CRANE

2.13.1 Reasons for Status

The whooping crane *(Grus americanus)* was listed as endangered on March 11, 1967 (F.R. Doc. 67-2721). The whooping crane population, estimated at 500 to 700 individuals in 1870 declined to only 16 individuals in the migratory population by 1941 as a consequence of hunting and specimen collection, human disturbance, and conversion of the primary nesting habitat to hay, pastureland, and grain production. The main threat to whooping cranes in the wild is the potential of a hurricane or contaminant spill destroying their wintering habitat on the Texas coast. Collisions with power lines and fences are known hazards to wild whooping cranes. The primary threats to captive birds are disease and parasites. Bobcat predation has been the main cause of mortality in the Florida experimental population. (FWS, 2001).

2.13.2 Habitat

The nesting area in Wood Buffalo National Park is a poorly drained region interspersed with numerous potholes. Bulrush is the dominant emergent in the potholes used for nesting. On the wintering grounds at Aransas National Wildlife Refuge in Texas, whooping cranes use the salt marshes that are dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye. They also forage in the interior portions of the refuge, which are gently rolling, sandy, and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak, redbay, Bermuda grass, and bluestem. The non-migratory, Florida release site at Kissimmee Prairie includes flat, open palmetto prairie interspersed with shallow wetlands and lakes. The primary release site has shallow wetlands characterized by pickerel weed, nupher, and maiden cane. Other habitats include dry prairie and flatwoods with saw palmetto, various grasses, scattered slash pine, and scattered strands of cypress. Areas selected for the proposed eastern migratory experimental population closely mimic habitat of the naturally occurring wild population in Canada and Texas (FWS, 2001).

2.13.3 Range

Historic: The historic range of the whooping crane once extended from the Arctic coast south to central Mexico, and from Utah east to New Jersey, into South Carolina, Georgia, and Florida. The historic breeding range once extended across the north-central United States and in the Canadian provinces, Manitoba, Saskatchewan, and Alberta. A separate non-migratory breeding population occurred in southwestern Louisiana (FWS, 2001).

Aransas/Wood Buffalo Population: The current nesting range of the self-sustaining natural wild population is restricted to Wood Buffalo National Park in Saskatchewan, Canada and the current wintering grounds of this population are restricted to the Texas Gulf Coast at Aransas National Wildlife Refuge and vicinity. It is experiencing a gradual positive population trend overall, although some years exhibit stationary or negative results. In January, 2000, there were 187 individuals in the flock, including 51 nesting pairs (FWS, 2001).

An aerial whooping crane census was conducted March 4-5, 2008 at the Aransas National Wildlife Refuge and surrounding areas. The estimated size of the flock is listed at 266 birds, consisting of an estimated 144 adults, 83 subadults, and 39 juveniles. The total number of whooping cranes located on the census was actually 268, with presumably at least 3 cranes that moved and were counted twice. With the flight conducted on two consecutive afternoons, it is expected that a few cranes moved between portions of the census area and were counted on both days (Stehn, 2008).

Rocky Mountain Experiment: In 1975, an effort to establish a second, self-sustaining migratory flock was initiated by transferring wild whooping crane eggs from Wood Buffalo National Park to the nests of greater sandhill cranes at Grays Lake National Wildlife Refuge in Idaho. This Rocky Mountain population peaked at only 33 birds in 1985. The experiment terminated in 1989 because the birds were not pairing and the mortality rate was too high to establish a self-sustaining population. In 1997, the remaining birds in the population were designated as experimental, non-essential to allow for greater management flexibility and to begin pilot studies on developing future reintroduction methods. In 2001, there were only two remaining whooping cranes in this population (FWS, 2001), and in October 2007, the number was down to zero (Whooping Crane Eastern Partnership, Feb. 2008).

Captive Populations: As of October 2007, there were 148 captive whooping cranes held at eleven facilities (Whooping Crane Eastern Partnership, Feb. 2008). Four facilities: Patuxent Wildlife Research Center, International Crane Foundation, Calgary Zoo, and San Antonio Zoo are considered to have successful breeding programs. Chicks produced at the captive facilities either remain in captivity to maintain the health and genetic diversity of the captive flock, or are reared for release to the wild in the experimental reintroduction programs (FWS, 2001).

Florida Experimental Nonessential Population: An experimental reintroduction of whooping cranes in Florida was initiated in 1993 to establish a non-migratory population at Kissimmee Prairie. A non-migratory population avoids the hazards of migration, and by inhabiting a more geographically limited area than migratory cranes, individuals can more easily find compatible mates. From 1993 to 2001, 233 isolation-reared whooping cranes had been released in the area. In spring 2000, there were 65 individuals in the project area with 10 pairs defending territories and evidence of the first successful hatching of chicks (FWS, 2001). As of October 2007, this number is now 41 with 17 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

Eastern Migratory Population: A second experimental non-essential population is currently being reintroduced to eastern North America (FWS, 2001). The intent is to establish a migratory flock which would summer and breed in central Wisconsin, migrate across the seven states and winter in west-central Florida. The birds are taught the migration route after being conditioned to follow costumed pilots in ultralight aircraft. Initial experiments using sandhill cranes, completed in the Fall of 2000, successfully led 11 cranes 1,250 miles from Necedah National Wildlife Refuge in Wisconsin to Chassahowitzka National Wildlife Refuge in Florida. The birds winter in Florida and then migrate back to Wisconsin on their own in the spring.

Following this success, the first attempt to lead whooping cranes was made in 2001. Seven birds made it to Florida and the five that survived the winter returned to central Wisconsin the following spring. An additional 16 birds were successfully reintroduced to the flyway in 2002. In 2006, the total re-introduced population reached a high of 82 birds. In February 2007, 17 young birds of the 2006 hatching season were lost due to a severe storm at Chassahowitzka National Wildlife Refuge. There are currently attempts to establish a second wintering site at St. Marks National Wildlife Refuge, also on the Florida Gulf Coast, as a precaution against potentially similar circumstances in the future. As of spring 2008, it is expected that 76 cranes will migrate north as part of this eastern flock with 4 adult pairs (Whooping Crane Eastern Partnership, Feb. 2008).

2.13.4 Distribution in Texas

The Aransas-Wood Buffalo population of cranes migrates southeasterly through Alberta, Saskatchewan and eastern Manitoba, stops-over in southern Saskatchewan, and continues through the Great Plains states of eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas (FWS, 2007). About 9,000 hectares of salt flats on Aransas National Wildlife Refuge and adjacent islands comprise the principal wintering grounds of the whooping crane. Marshes are dominated by salt grass (*Distichlis spicata*), saltwort (*Batis* *maritima*), smooth cordgrass (*Spartina alterniflora*), glasswort (*Salicornia* sp.), and sea ox-eye (*Borrichia frutescens*). Inland margins of the flats are dominated by Gulf cordgrass (*Spartina spartinae*). Interior portions of the refuge are gently rolling and sandy and are characterized by oak brush, grassland, swales, and ponds. Typical plants include live oak (*Quercus virginiana*), redbay (*Persea borbonia*), and bluestem (*Andropogon* spp.). In the last 30 years, many upland sites have been grazed, mowed, or burned under controlled conditions to maintain oak savannah habitat. The refuge maintains as many as 3,300 ha of grassland for cranes, waterfowl, and other wildlife. Human visitation is carefully controlled, and other potentially conflicting uses of the refuge, such as activities associated with oil and gas exploration, are reduced when whooping cranes are present (FWS, 2007).

2.13.5 Presence in the Project Area

The whooping crane has been recorded in Nueces County, and may potentially access waters on the bay side and interior of Mustang and Padre Islands outside the project area. There has never been a whooping crane sighting on a beach or dry dune system (Stehn, 2008).

2.13.6 Effects of the Project

While the whooping crane has been recently sighted in Nueces County, such occurrences are rare. Given its rarity and suitable habitat only in waters on the leeward side and interior of the barrier islands, combined with the fact that this project site is on a Gulf beach and not in a suitable habitat where this species frequents, this project will not affect the whooping crane.

2.13.7 Conservation Measures

Because no potential effects to the whooping crane are likely to occur as a result of the proposed project, no additional conservation measures are needed.

2.13.8 Conclusion

Based on the preceding analysis, the overall conclusion of this Biological Assessment is that the proposed project will have no effect on the whooping crane.

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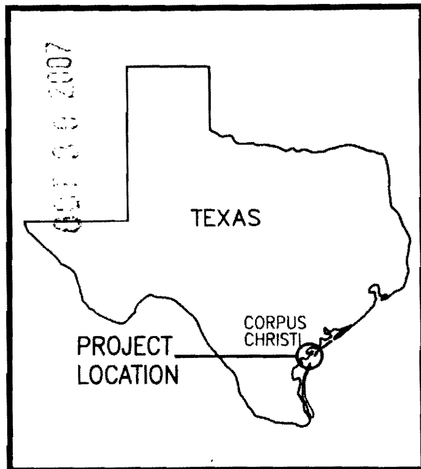
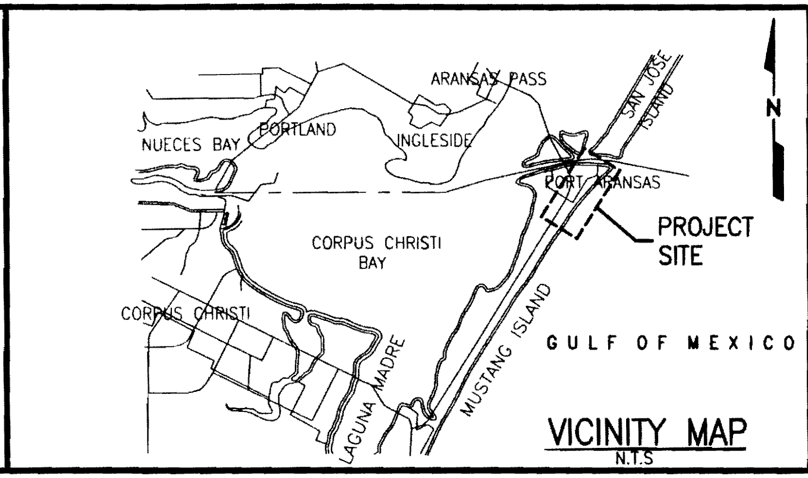
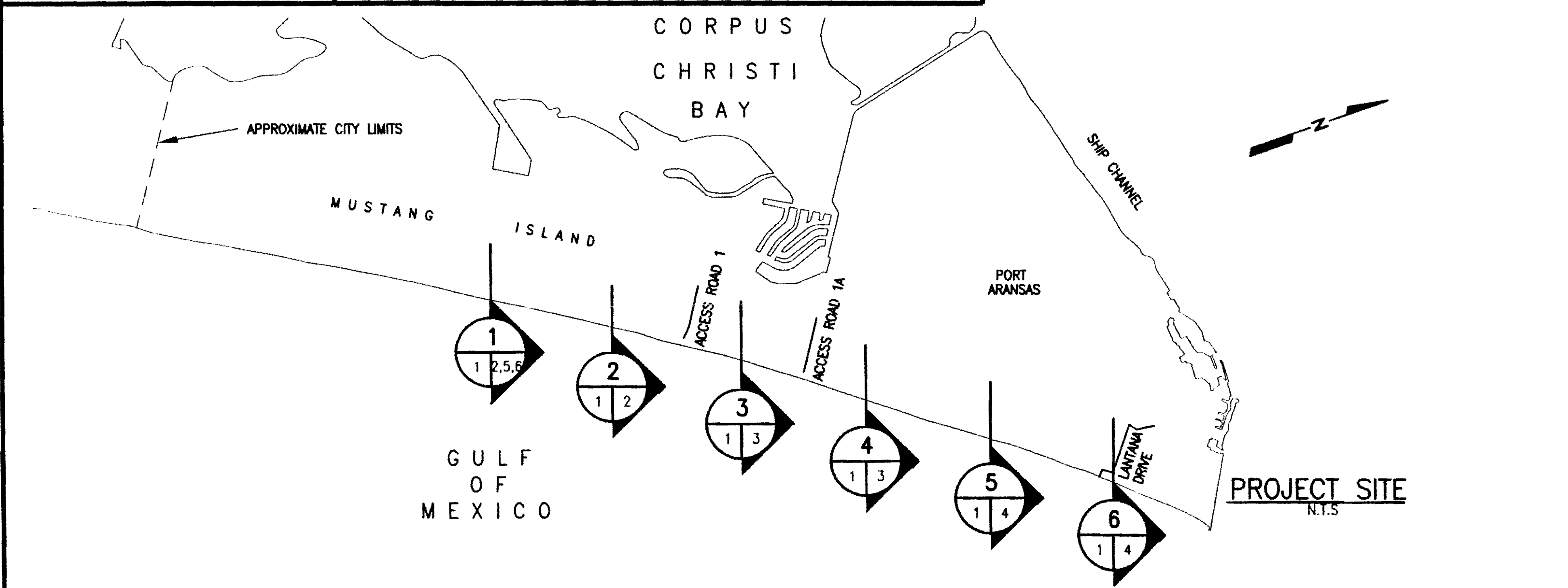
Attachment 1

Permit Application Drawings

PROJECT LOCATION







FOR COE USE ONLY	
Permit Application No.: SWG-2007-1847	
Applicant Name: City of Port Aransas	
Sheet 1 of 8	

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

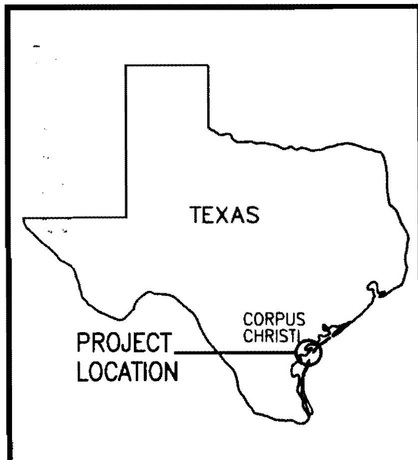
COUNTY: NUECES

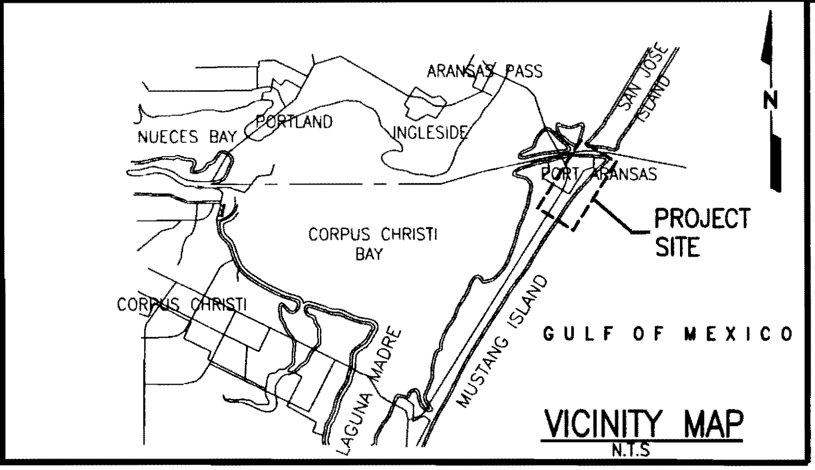
DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

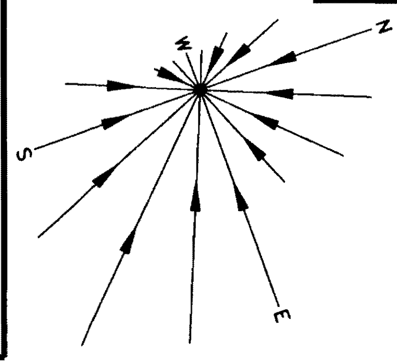
PROJECT No: 66107	SHEET 01 of 08

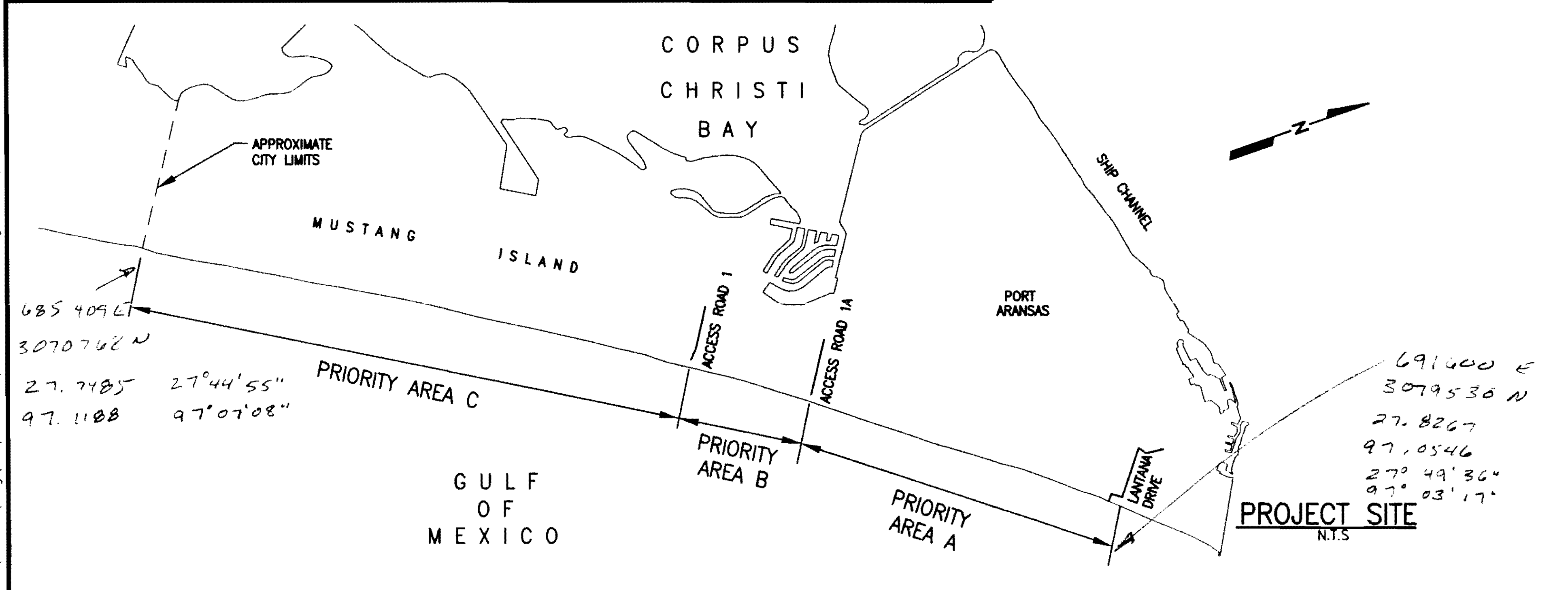
BEACH MAINTENANCE PRIORITY AREAS





VICINITY MAP
N.T.S





PROJECT SITE
N.T.S

FOR COE USE ONLY
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APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

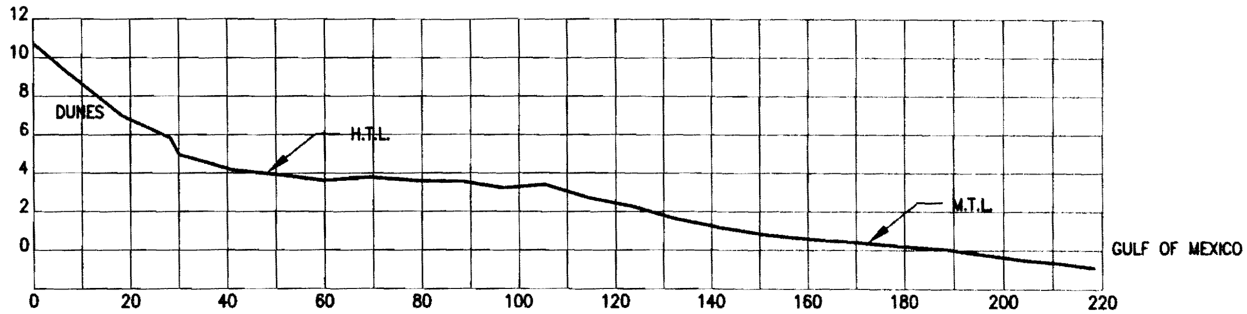
PROJECT No: 66107	SHEET 02 of 08

EXISTING CONDITIONS 1/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 1 IS LOOKING NORTH AT MIRAGE CONDOMINIUM.
4. SECTION 2 IS LOCATED AT MARKER 48 LOOKING NORTH.

OCT 3 0 2007



2 | 1 | 2 EXISTING CONDITIONS - SECTION

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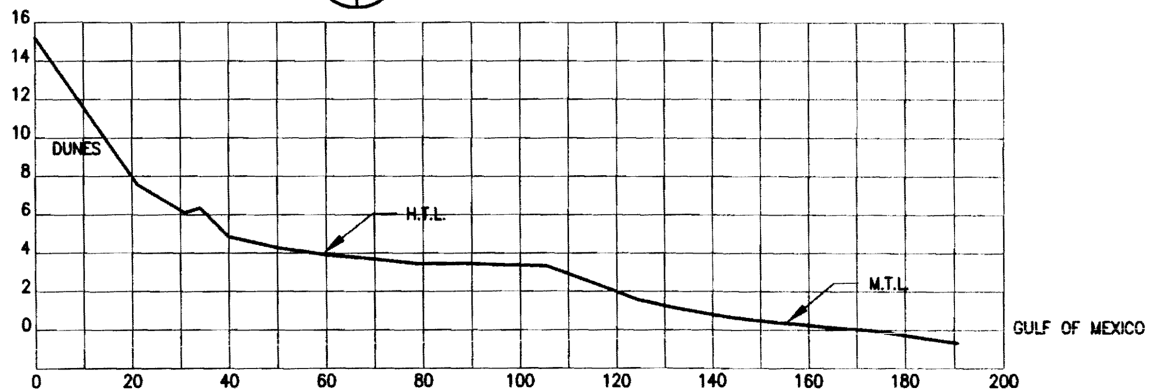

1 | 1 | 2,5,6 EXISTING CONDITIONS - SECTION

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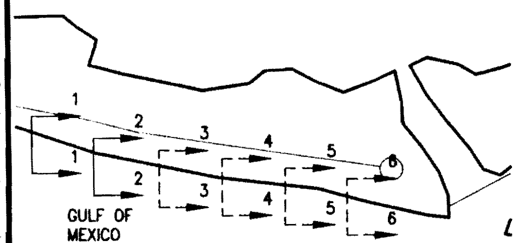

HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

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Applicant Name: City of Port Aransas
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APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
DATE: 08/07	REV. DATE: 8-14-2007	DATUM: NAVD'88

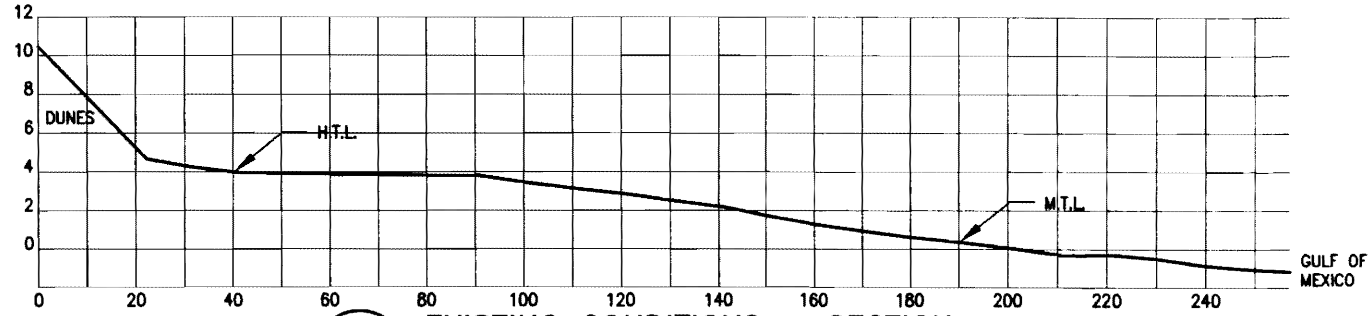
HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 03 of 08

EXISTING CONDITIONS 2/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 3 IS LOCATED 300' NORTH OF MARKER 35 LOOKING NORTH.
4. SECTION 4 IS LOCATED AT MARKER 22 LOOKING NORTH.



4 (1 | 3) EXISTING CONDITIONS - SECTION

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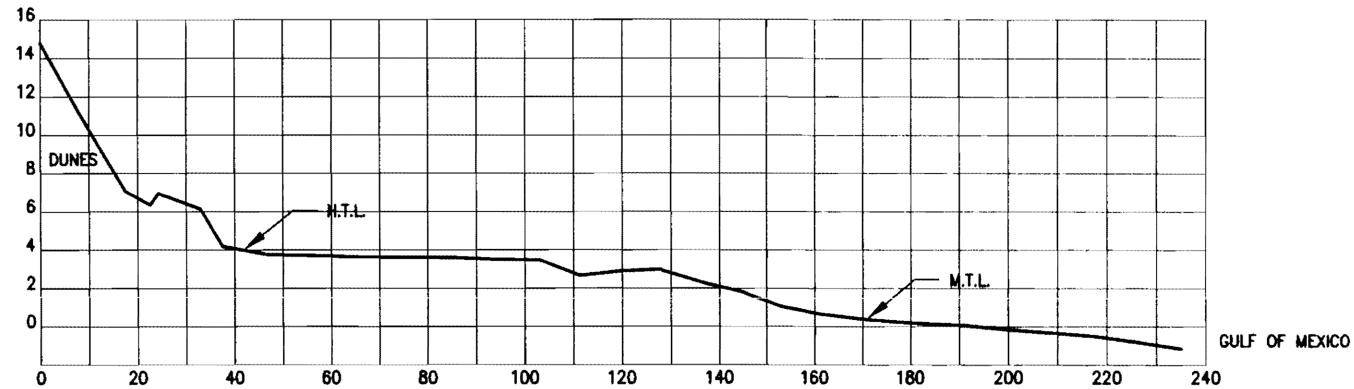

3 (1 | 3) EXISTING CONDITIONS - SECTION

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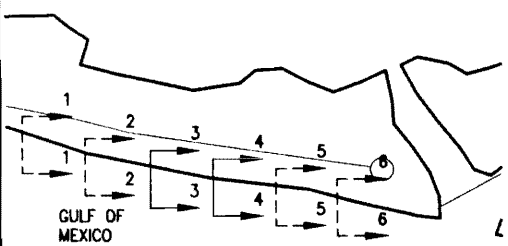

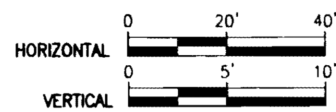

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APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 08/07 | REV. DATE: 8-14-2007 | DATUM: NAVD'88

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555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

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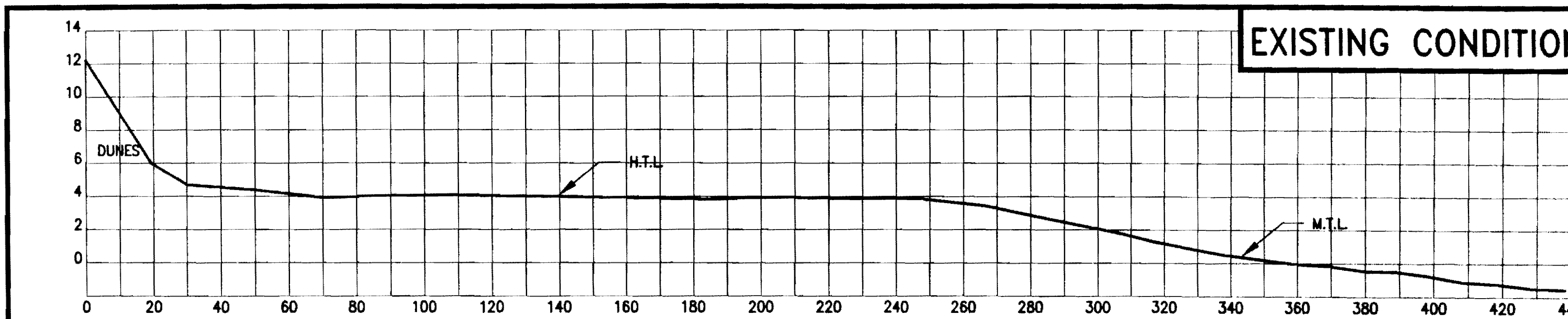
EXISTING CONDITIONS 3/3



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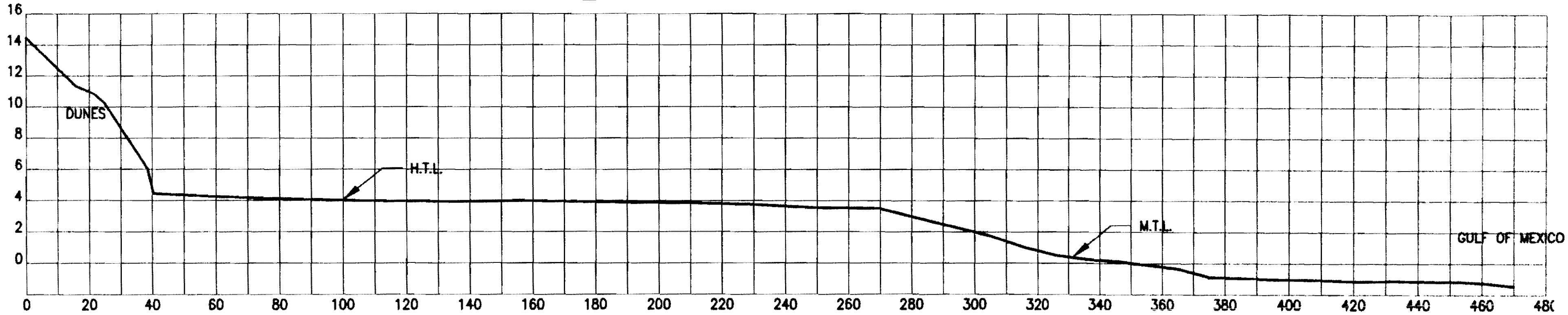


5 (1 | 4) EXISTING CONDITIONS – SECTION

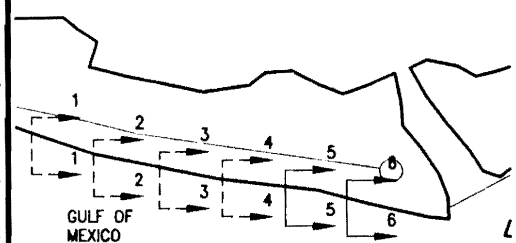
SCALE: GRAPHIC

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR/SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 5 IS LOCATED AT MARKER 10 LOOKING NORTH.
4. SECTION 6 IS LOCATED SOUTH OF LANTANA DRIVE BY DUNES CONDOMINIUM.

HORIZONTAL 0 25' 50'

VERTICAL 0 5' 10'



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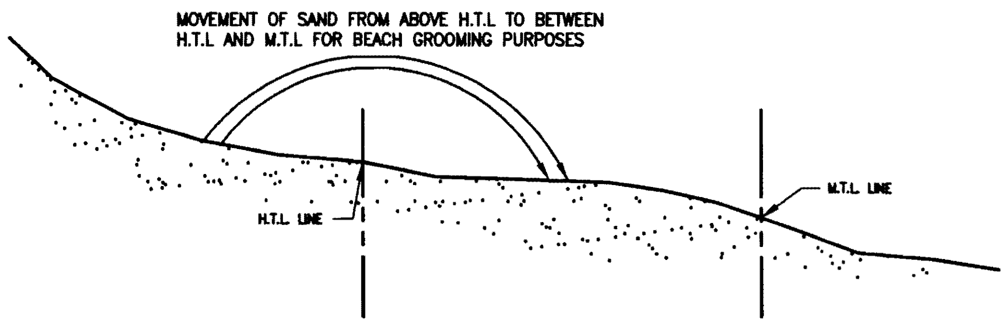
PROJECT No: 66107

OCT 30 2007

PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

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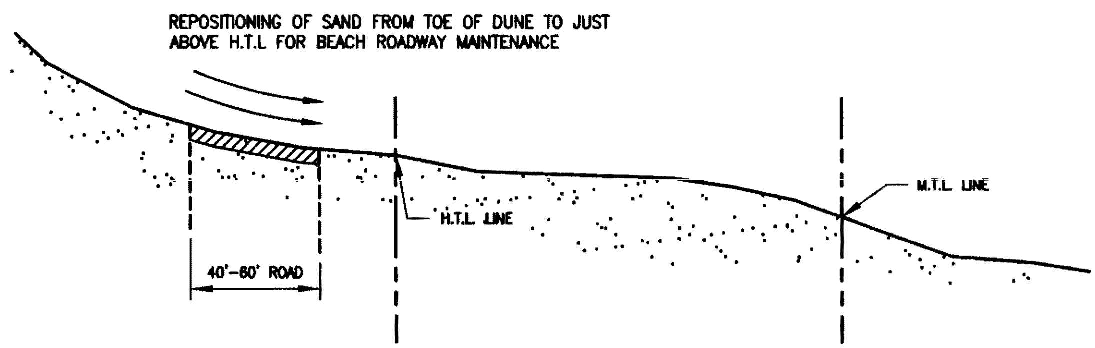

2 | 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION

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APPLICANT: CITY OF PORT ARANSAS			
PROJECT NAME: GULF BEACH CLEANING			
COUNTY: NUECES			
DATE: 06/07	REV. DATE: 8-14-2007	DATUM:	

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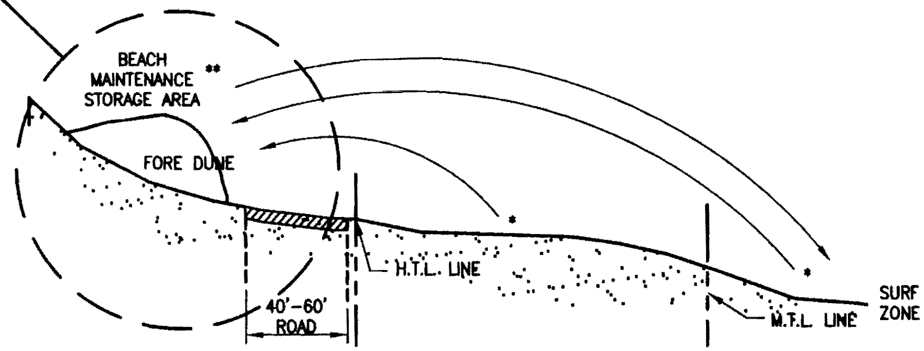
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 06 of 08

PROPOSED BEACH MAINTENANCE PRACTICES

SEE DETAIL FOR ALTERNATE PLACEMENT AREAS ON SHEET 8 OF 8 (1 / 7 | 8)



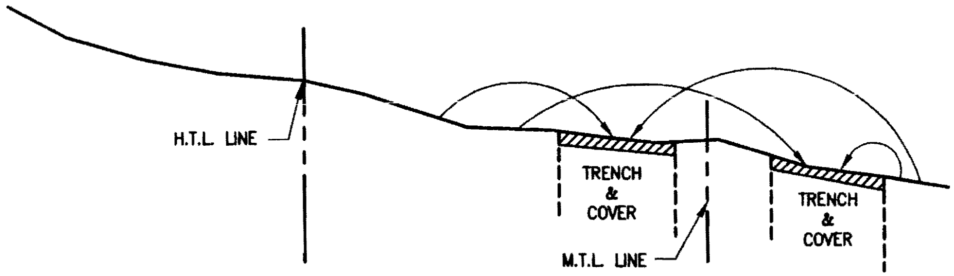
* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.

PROPOSED MAINTENANCE – TYPICAL SECTION

(1 / 1 | 2,5,6)

SCALE: N.T.S.



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

PROPOSED MAINTENANCE – TYPICAL SECTION

(1 / 5 | 5)

SCALE: N.T.S.

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Applicant Name: City of Port Aransas
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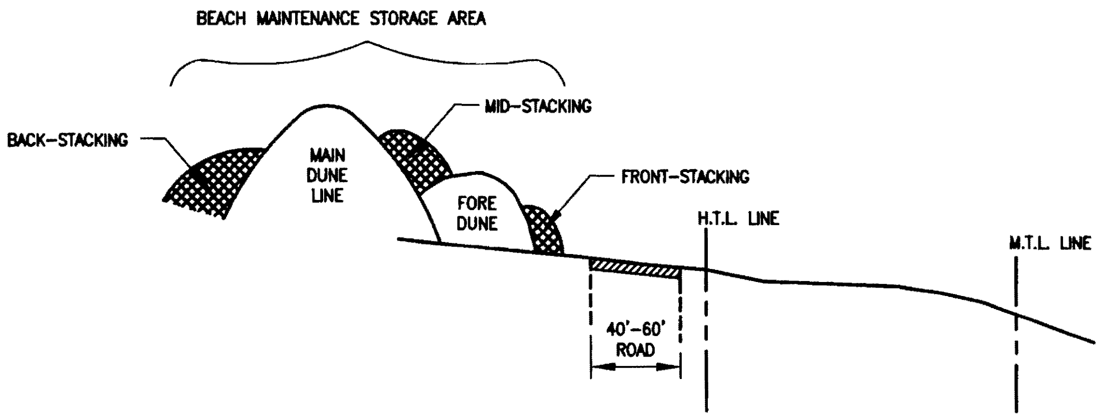
APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
DATE: 06/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 07 of 08

PROPOSED BEACH MAINTENANCE PRACTICES



1 PROPOSED MAINTENANCE – TYPICAL SECTION

1 | 2,5,6

SCALE: N.T.S.

ALTERNATE PLACEMENT AREAS

SAND/SARGASSUM IS PROPOSED TO BE PLACED IN THREE LOCATIONS WITHIN THE BEACH MAINTENANCE STORAGE AREA:

A. FRONT -STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM ABOVE H.T.L AT BASE OF FOREDUNE ON ACCRETING BEACHES ONLY.

B. MID-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM WITHIN TROUGHS BEHIND THE FOREDUNE ON ALL BEACHES.

C. BACK-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM IN BACK OF THE MAIN DUNE LINE ON ALL BEACHES.

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Sheet 8 of 8

APPLICANT: CITY OF PORT ARANSAS		
PROJECT NAME: GULF BEACH CLEANING		
COUNTY: NUECES		
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HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 08 of 08

Attachment 2

Habitat Monitoring

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008 (Rev. Feb. 2009)

TABLE OF CONTENTS

INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be

permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of

sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake –** This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities result in ruts greater than two inches deep, the City will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement if it is found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 ft. long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 ft. long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 ft. long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 ft. survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 ft. survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 ft. survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 ft. survey area beginning at marker 50 and heading south toward marker 51.

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous beach profile within the 200 ft. survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 ft. survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 ft. long survey area. The number of birds, species types, behavior, and location within the 200 ft. survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

REPORTING RESULTS

The City's consultant will compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years. Additionally, if equipment tires are retrofitted tires so that they are inflated to no greater than 10 PSI in an attempt to reduce or eliminate rutting, the results will be monitored and reported.

Wong, John E SWG

From: Mary_Orms@fws.gov
Sent: Wednesday, March 04, 2009 11:17 AM
To: MicheleT@cctexas.com
Cc: Mullins, Henry L SWG; Wong, John E SWG; Richter, Reagan R SWG
Subject: Fw: Sea turtle response refresher Sunday, March 15 8-Noon::: Training, Thursday March 26, 2009 7am - 2:30pm

----- Forwarded by Mary Orms/R2/FWS/DOI on 03/04/2009 11:05 AM -----

Tom Shearer/R2/FWS/DOI

03/04/2009 09:07 AM

To allan_strand@fws.gov, robyn_cobb@fws.gov, pat_clements@fws.gov, clare_lee@fws.gov, mary_orms@fws.gov, tim_anderson@fws.gov, beau_hardegree@fws.gov, larisa_ford@fws.gov, tammy_ash@fws.gov, sharon_becton@fws.gov, donna_chapman@fws.gov, kenneth_rice@fws.gov, craig_giggleman@fws.gov, dawn_whitehead@fws.gov, amber_miller@fws.gov

cc

Subject Sea turtle response refresher Sunday, March 15 8-Noon::: Training, Thursday March 26, 2009 7am -2:30pm

From Cynthia Rubio at the PAIS/PINS:

This year the training will involve both nesting and strandings, but the tagging and sample collection will be on a different day. If the biologist from your agency have taken this training before, then it may not be necessary for them to attend the training. If you have new employees in your agency, then it would be good to have them take this training. The training will at the Padre Island National Seashore Turtle Lab on March 26, from 7:00 a.m. until about 2:30. People attending should bring a lunch and something to drink. Space is limited in the Lab, so it would be best that only those new employees attend. This is the in-depth training session, which is more detailed than will be given to the volunteers, beach scrapers, oil and gas monitoring escorts, etc.

There will also be a shortened "refresher" training for our returning volunteers, which will be on March 15 at the Turtle Lab from 8-12:00 p.m. If you have any staff that would like to have a refresher they are also welcome to attend this session. Last year we distributed a CD with pictures of the tracks, it would be good if your staff review the CD before the season begins in April. It would be very helpful if we could get an estimate of how many people from the two agencies would be attending and which days.

Tom Shearer
Wildlife Biologist

Mail: USFWS/TAMUCC Unit 5837
6300 Ocean Drive
Corpus Christi, TX 78412-5837

Delivery: USFWS/TAMUCC
CW CESS Bldg Rm 118
6300 Ocean Drive
Corpus Christi, TX 78412-5837

Phone: (361) 994-9005
Fax: (361) 994-8262

Wong, John E SWG

From: Mary_Orms@fws.gov
Sent: Wednesday, May 13, 2009 1:59 PM
To: Wong, John E SWG
Subject: Port Aransas Draft BO

John,

I looked up an example of what the take would look like for individual turtles. I got it out of one of the oil and gas BOs on PAIS. Just FYI. We will incorporate it into the Draft BO when we finalize it and also I think we will have to amend the Final BO for the City of Corpus maintence BO to include this.

Sorry, So glad you caught that.

Mary

1) 2 adult Kemp's ridley sea turtle per year could be taken by vehicular strike.
2) 1 adult loggerhead sea turtle per year could be taken by vehicular strike.
3) 1 adult green sea turtle per year could be taken by a vehicular strike.
4) 1 adult hawksbill sea turtle per year could be taken by vehicular strike.
5) 1 adult leatherback sea turtle per year could be taken by vehicular strike.

MAY 13 2009

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

May 8, 2009

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office
Department of the Army
Galveston District, Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411-4318

Consultation No. 21410-2008-F-0099

Dear Mr. Mullins:

This transmits the U.S. Fish and Wildlife Service's (Service) **Draft** Biological and Conference Opinion (BCO) based on our review of the proposed issuance of U.S. Army Corps of Engineers (USACE) permit SWG-2007-01847 authorizing the City of Port Aransas (City) to perform beach maintenance activities along approximately 7 miles (11.3 kilometers) of beach beginning at the southern city limits and extending north to Lantana Drive and its effects on the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), threatened green sea turtle (*Chelonia mydas*), threatened loggerhead sea turtle (*Caretta caretta*), and proposed critical habitat for the threatened piping plover (*Charadrius melodus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. §1531 et seq.). This BCO is based on information provided in the *Final Biological Assessment (BA) of Potential Impacts to Threatened and Endangered Species, Department of the Army Permit Application SWG-2007-01847 by City of Port Aransas, U.S. Army Engineer District, Galveston, December 5, 2008.*

The USACE determined that the proposed project would have no effect on the endangered Gulf Coast jaguarundi (*Herpailurus yagouaroundi cacomitli*), endangered ocelot (*Leopardus pardalis*), endangered slender rush-pea (*Hoffmannseggia tenella*), South Texas ambrosia, (*Ambrosia cheiranthifolia*), endangered West Indian manatee (*Trichechus manatus*), and the endangered whooping crane (*Grus americana*) as these species are not known to occur in the project area. Also, based on current research and information, the Service concurred with USACE's determination of "may affect, but is not likely to adversely affect" for the endangered brown pelican (*Pelecanus occidentalis*), endangered Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), endangered leatherback sea turtle (*Dermochelys coriacea*), and threatened piping plover. The USACE will condition any permit issued to the City for this work to include a provision that all employees must be provided information on the status and habitats of the brown pelican. We concurred with these determinations as detailed in a February 13, 2009letter and these species will not be considered further in this Draft BCO.

Critical habitat for the piping plover on its wintering grounds was designated July 10, 2001 (66 FR 36038) but the designation was challenged on March 20, 2006, by the Texas General Land Office (GLO). The court ordered the Service to vacate 19 of the 37 designated units in Texas and re-evaluate them for re-designation. On May 20, 2008 (73 FR 29294) the Service revised and proposed the designation of critical habitat for wintering piping plovers in Texas in 18 specific units, one of which (Unit TX-8) occurs within the proposed project area.

The USACE requested initiation of formal consultation on December 16, 2008, for the three sea turtle species and a formal conference for proposed wintering piping plover critical habitat units on February 10, 2009. A complete record of this consultation is on file in the Corpus Christi, Ecological Services Field Office in Corpus Christi, Texas.

Consultation History

A summary of the extensive consultation history is included as Appendix A.

BIOLOGICAL AND CONFERENCE OPINIONS

I. Description of the Proposed Action

Purpose of Project
The proposed action is the issuance of a Department of the Army (DA) permit SWG-2007-01847 to authorize beach maintenance activities pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Beach maintenance has been carried out by the City of Port Aransas since the 1970's. Future work, as proposed, will need a permit.

Action Area
The project area is defined as the area where the actual beach maintenance will take place, as depicted in the permit application drawings. It also includes the area to be affected directly and indirectly by the project. It is proposed for approximately 7 miles (11.3 kilometers) of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, Texas. The proposed beach maintenance does not include that beach segment from the South Port Aransas jetty to the Horace Caldwell Pier at Lantana Drive which is the responsibility of Nueces County (Figure 1).

Proposed Action
The proposed action consists of the City conducting beach maintenance. This work is to be done by: (a) removing all non-natural material such as lumber, plastic, bottles, cans,

etc. from the beach and disposing of them in a sanitary landfill, (b) relocating sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL, (c) trenching and burying sargassum or seaweed on the beach above the mean high tide (only during periods when there is an abundance of material in the dunes) (d) repositioning sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access and (e) once the sargassum decomposes, removing from the beach maintenance storage area and placing it in the surf zone below MTL. The permit will be issued for a five-year period, after which a request for an extension of time will be required to continue permitted activities (Figures 2, 3).

Beach maintenance practices will typically occur seasonally (April-August) but could be performed at other times of the year if conditions merit. Sargassum beach cleaning practices could be required as late as October when tropical storms or hurricane activities wash ashore large volumes of vegetative material. The frequency of roadway maintenance will be dictated by roadway use and environmental conditions and could occur year round. Most beach maintenance activities will take place between the hours of 7:00 a.m. and 3:30 p.m. The length of beach to be cleaned, the methods employed and the duration of maintenance activities in a given day will vary with beach conditions and staff availability.

The City's priority system for determining the order and areas to be cleaned is:

Priority Area A – High use areas including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, beginning at approximately 7:00 a.m., so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority Area A every day.

Priority Area B – Semi-heavily used areas including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas, from late-morning to mid-afternoon. Ground trash is handpicked from Priority Area B every day.

Priority Area C – Low use areas including those portions of the beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than Priority areas A and B. Ground trash is handpicked from Priority Area C every day (Figure 4).

Any additional work on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

The type and size of equipment that may be used for beach cleaning are as follows:

Articulated Front-end Loaders – This machinery will typically be used to remove sargassum and a small amount of sand from between HTL and below MTL with subsequent placement of this material into Texas General Land Office (TGLO) beach maintenance storage areas located above HTL. This equipment will be utilized in Priority Areas A, B, and C. Articulated front-end loaders have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Motor Grader – A motor grader has a 10-14 inch (25.4-35.5 centimeters) blade that scrapes sargassum into a wind row located above and below the MTL. The blade can then be used to dig a trench and the sargassum wind row pushed into the trench and buried. The motor grader will also be used to level the beach from below MTL to HTL and to level the driving area. A motor grader will also be used in Priority Areas A, B, and C. Motor graders with rakes have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Dump Trucks – Dump trucks will typically be used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

Garbage Trucks – Garbage trucks will typically be used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's landfill. In addition, garbage trucks will be used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's landfill.

Pick-up Trucks – Pick-up trucks will typically be used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks may be used to remove large pieces of trash, such as lumber, and will typically be used in Priority Areas A, B, and C.

Tractor with Rake Attachment - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL and will be used in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Tractor with Surf Rake – This piece of equipment will typically be used to remove very small debris, seaweed, etc. from below MTL to above HTL and will be used in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

The City will typically have the following Public Works Staff assigned to beach maintenance: 1) four full-time heavy equipment operators, 2) two supervisors, and 3) six full-time ground custodians.

Conservation Measures
Conservation measures represent actions, pledged in the project description, correspondence and/or meetings, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. Since conservation measures are part of the proposed action, their implementation is required under the terms of the consultation. The USACE and the City have proposed the following conservation measures.

Piping Plover

Maintenance
Sargassum will be indiscriminately left in place as it is a primary constituent element for foraging piping plovers.

During beach maintenance activities equipment will be driven above the "wet line" on the beach to minimize disturbance of birds.

The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m.

Education
The USACE will condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species.

The City will arrange a yearly training course with a Service approved agency or facility (PAIS, University of Texas Marine Science Institute (UTMSI), Service). The scope of the training will include: (1) Identification of piping plovers; (2) Recognition of habitat; (3) Basic procedures for recording piping plover information; and (4) contact information for different rehabilitation agencies in the area.

The City will arrange for annual refresher training for existing beach maintenance staff, and provide new hires with piping plover training. This training will also be arranged with a Service approved agency or facility.

Monitoring
A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken to allow the City to conduct beach maintenance activities as authorized by the USACE permit and adaptively monitor the effects of beach maintenance activities on an as-needed basis (Attachment 2). Parameters to be assessed are: beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities.

Results of the habitat monitoring effort will be provided in an annual report to the USACE by February 1 of each year for a period of 5 years.

Sea Turtles

Maintenance

Beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. No maintenance equipment will enter a work area until an initial turtle survey has been performed and they are notified by the certified turtle patroller that it is clear to proceed.

If a turtle or turtle nest is located beach cleaning activities will immediately cease within 100 feet (30.48 meters) of the nest site and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City will have its staff flag the nest area and recommence work making sure that the nest site is avoided.

All ruts and berms created by city equipment engaged in beach maintenance activities will be smoothed out to no greater than 2 inches (5.08 centimeters) each day to enhance turtle tracks identification and to prevent small turtles from becoming entrapped. If ruts are to be smoothed with the use of a backhoe or tractor, a certified patroller will check for nesting turtles or tracks prior to smoothing the area.

If beach maintenance activities result in ruts greater than 2 inches (5.08 centimeters) deep, the City will explore the possibility of retrofitting equipment tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting or using multiple pieces of equipment in tandem to attain this target. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. A certified patroller will check for nesting turtle or tracks prior to smoothing the area.

Mechanical beach cleaning equipment shall not penetrate the surface of the beach more than 2 inches (5.08 centimeters). During beach maintenance activities equipment will be driven above the "wet line" on the beach to more easily identify sea turtle tracks.

If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredunes.

If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (61 meters) to allow turtles to traverse these areas, minimize the potential of turtle nest being covered by the sargassum and reduce fire ant infestation.

The City will be allowed to build an approximately 20-foot (6.1 meters) wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be present in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where the berms are in place, they will create an unrestricted pass for the turtle by smoothing out the berm with a shovel or tool. The proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest after an initial sweep of the site is done by a certified patroller. The piles of sand, and the sculptures made from the will be spaced so as to allow ample open beach for use by nesting turtles. The sculptures and mounds of sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

Education

The City will require all personnel involved in beach maintenance activities to receive training each year prior to their involvement in cleaning activities. The scope of the training will include: (1) identification of different turtle species; (2) recognition of turtle tracks or crawls; (3) basic procedures for recording turtle information if a turtle returns to the water prior to arrival of the turtle patrol team (4) protection of nest areas (5) contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will also be arranged with a Service approved agency or facility prior to turtle nesting season.

The City will require all turtle patrollers to receive an initial training and refresher course each year from a PAIS representative. This training will be an all day training and more intense than that required for the beach maintenance personnel.

The City will ensure that public education signs concerning turtles and their protection are posted at strategic locations within the project area.

Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at Padre Island National Seashore (PAIS). These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle siting occurs.

Monitoring

Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the

USACE for approval. This plan will detail how the City will ensure compliance with the conservation measures for sea turtles. An annual follow-up report will be presented to the USACE prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, the number of turtles taken, if any, listed by species, and a summary of. Measures implemented during project activities, relative success of those measures and any recommendations for improvement to the measures.

The City will provide a financial reward to any City beach maintenance employee who successfully identifies a turtle nesting site. All turtles, turtle nests, or turtle eggs found by monitors or maintenance personnel will be safe-guarded by City staff until they can be relocated by the appropriate authorities.

The City will ensure that daily turtle patrols are carried out during peak turtle nesting from March 15 to October 1 for the entire 7-mile (11.3 kilometers) stretch of beach within the project area, beginning at sunrise and ending at 6:30 p.m. The USACE will require the City to provide a trained certified turtle patroller or supervisor on-site to accompany equipment from March 15 to July 30.

In the event a take occurs, the City will immediately notify the USACE, Corpus Christi Regulatory Office (361) 814-5847 and the Service's Corpus Christi Field Office (361) 994-9005.

II. Status of the Species/Critical Habitat

Sea Turtles

The Service has jurisdiction for protecting sea turtles in inland waters and on the nesting beaches. The National Marine Fisheries Service (NMFS) has jurisdiction for protecting sea turtles in the marine environment. Five species of sea turtles are found in U.S. waters and nest on U.S. beaches: leatherback, hawksbill, loggerhead, green and Kemp's ridley. All are known to nest in Texas. The leatherbacks, hawksbills and Kemp's ridleys rarely nest in the southeastern U.S., but offshore waters are important feeding, resting, and migratory corridors. Only three sea turtles species (Kemp's ridley, loggerhead and green) that may be affected by the proposed project are discussed below.

Kemp's ridley sea turtle

Description

Kemp's ridley sea turtle was listed as endangered throughout its entire range on July 28, 1978 (43 FR 32800). Its range includes the Gulf coasts of Mexico and the U.S., and the Atlantic Coast of North America up to Nova Scotia and Newfoundland. It is known to occur in Alabama, Connecticut, Delaware, Florida, Georgia, Louisiana, Massachusetts, Maryland, Mississippi, North Carolina, New Jersey, New York, Rhode Island, South Carolina, Texas and Virginia and along Mexico's Atlantic Coast, as well as in tropical and temperate waters of the Atlantic Basin. Approximately 60 percent of Kemp's ridley turtles nest on the coastal beaches of North Padre Island. Approximately 99.9 percent of nests are found on coastal beaches of Tamaulipas and Veracruz where approximately 10,000 nests were protected in 2005, 12,000 nests were protected in 2006, and 15,000 nests in 2007 (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). A few Kemp's ridleys nest consistently at PAIS in Texas. Numbers have increased during recent years and are expected to continue to increase. Kemp's ridleys rarely nest at other locations in the U.S. outside of Texas (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Lately, females nesting on the Texas coast remain resident during the nesting season and after nesting season, some adults are transient here, but some remain resident. Two females traced prior to 2006 stayed here and one that was outfitted with a transmitter in 2007 also remained in Texas while a male that was tracked in Mexico traveled to waters off the Texas coast (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). The tracking studies conducted by Texas A&M University at Galveston are also showing residency of nesters in Texas waters during and to some extent after the nesting season (pers. comm. D. Shaver (NPS) to M. Orms (Service), Shaver et al 2005).

Kemp's ridley is the smallest of the sea turtles reaching about 2 feet (0.6 meters) in length and weighing up to 75-100 pounds (34-45 kilograms). The adult has an unusually broad, heart-shaped, keeled upper shell that is serrated behind the bridge, or midsection, almost as wide as it is long, and is usually olive-gray. The upper shell has five pairs of scales or plates along the sides. In the bridge hooking the lower shell to the upper shell, there are four infra-marginal plates, each perforated by a pore. The lower shell is a light, yellowish color. The head has two pairs of prefrontal scales. The Kemp's ridley has a triangular-shaped head with a somewhat hooked beak with large crushing surfaces. Juveniles have a dark-charcoal colored shell that changes to olive-green or gray with age. Preferred habitat for this species is shallow coastal and estuarine waters, primarily where crabs are found, but can occur in the bays on the middle and upper Texas coast with regularity.

Life history
Nesting occurs primarily around Rancho Nuevo, Tamaulipas, Mexico, from April to June although Kemp's ridley nests have been recorded as early as March and as late as August (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004). During preferred nesting conditions, precipitated by strong winds, the females come ashore mostly during the daytime, often in groups called "arribadas." Nests are dug on well-developed, elevated dunes in remote areas adjacent to large marsh complexes or shallow embankments. Although some females breed annually, this species is considered to nest biannually and may nest as many as three times a season (Service and NMFS 1992), with an average of 2.5 clutches per season. Clutch size averages between 100-110 eggs. Hatchlings emerge during the night and day after approximately 50 days of incubation. Sexual maturity is believed to be reached between 10 to 15 years of age. Some fidelity to nesting sites has been shown by Kemp's ridley, both within one nesting season, and between nesting seasons (pers. comm. D. Shaver (NPS) to R. Cobb (Service) 2003, Burchfield, et. al. 2002). If conditions are unsuitable on a nesting beach or the female is disturbed, she may return to the water and attempt to nest elsewhere within a short distance from the first site (within several kilometers to the north or south). It is also possible that the disturbance

could cause them to switch nesting beaches entirely (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004).

Kemp's ridleys occur in the Gulf of Mexico and along the Atlantic coast of the U.S. with nesting locations concentrating on coastal areas of Rancho Nuevo, Mexico. Favorable habitat conditions include areas that shelter the turtle from high winds and waves with forage habitats including seagrass, oyster reefs, sandy bottoms, mud bottoms, and rock outcroppings with a diet consisting primarily of crabs, shrimp, snails, sea urchins, sea stars, fish and occasionally marine plants (TPWD 1995).

Since 1978, an international cooperative, experimental project involving the NPS, PAIS, Service, NMFS, Gladys Porter Zoo (Brownsville, TX), and Mexican Federal and State agencies has been ongoing. The project was designed to establish a secondary nesting colony of Kemp's ridley turtles in the U.S. at PAIS. Eggs were collected in Mexico from 1978 to 1988 and transported to PAIS for incubation. Hatchlings were released onto the beach, allowed to enter the water and then immediately recaptured and raised in "head start" facilities at Galveston, Texas, for approximately 9 to11 months, until they were mature enough to be released into the Gulf of Mexico. In 1986, NPS initiated a program to detect, monitor, and protect sea turtle nests at PAIS. Detection involves patrols to look for nesting activity, public education, and investigation of reports from patrols, beach workers, and the public. Patrols (NPS staff members and volunteers) use ATVs to search the park and adjacent northern county beaches for sea turtle tracks and nesting Kemp's ridley turtles each day, from April through mid–July. NPS protects the nesting turtles while they are on the beach and then NPS removes all sea turtle eggs that are located from the beach and transfers them to the incubation facility at PAIS. The last head-started hatchling experimentally imprinted to PAIS was released in 1988 (Service and NMFS 1992, pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004). Hatchlings from the incubation facility are now released on the beach at PAIS and allowed to return to the Gulf of Mexico. Since 1996, some turtles experimentally imprinted to Padre Island, have returned to PAIS and the nearby vicinity to lay eggs (Shaver 1997, 1998a, 1999a, 1999b; Shaver and Caillouet 1998). Some other head-started Kemp's ridley have also nested at PAIS, but the majority of nests are turtles from the wild stock. From 1979 to 2008, 722 sea turtle nests were found on the Texas coast. Of the 722, 649 were Kemp's ridley nests, of which 361 were confirmed along the entire Gulf beachfront length of PAIS (Shaver 2008). For the 2008 nesting season, there have been a total of 195 confirmed nests. In addition to patrolling for all nesting turtles, NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Population dynamics

The Kemp's ridley sea turtle is an endangered sea turtle. Its numbers have precipitously declined since 1947, when more than 40,000 nesting females were estimated in a single *arribada* (Service and NMFS 1992). The nesting population produced a low of 702 nests in 1985 (Service and NMFS 1992). Since the mid-1980s, the number of nests laid in a season has been increasing, primarily due to nest protection efforts and implementation of regulations requiring the use of turtle excluder devices in commercial fishing trawls. During the 2005 and 2006 nesting seasons, more than 10,000 nests and 12,000 nests, respectively, and 15,000 in 2007 were present on nesting beaches in Mexico (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

Status and distribution

Reason for Listing:

For at least two decades, several factors have contributed to the decline of sea turtle populations along the Atlantic and Gulf coasts. Commercial over-utilization of eggs and turtle parts, incidental catches during commercial fishing operations, disturbance of nesting beaches by coastal housing, marine pollution, as well as entanglement and ingestion of debris threaten sea turtles (Service and NMFS 1992). The reproductive strategy of sea turtles involves producing large numbers of offspring to compensate for high natural mortality through the first several years of life. Additional threats are expanding human populations adjacent to important nesting beaches, degradation of coastal foraging habitats, and the potential effects of global warming on sex ratios (NMFS and Service 2007).

Range-wide trend

Historic nesting frequency on the south Texas coast is poorly known and only six Kemp's ridley turtles were documented prior to 1979 (Shaver and Caillouet 1998). Of the 722 sea turtle nests found on the Texas coast between 1979 and 2008, 649 were Kemp's ridley nests, 361 of which were found on PAIS (Shaver 2008). Today, through conservation efforts with Mexico and commercial fisheries, the population of Kemp's ridley appears to be in the early stages of recovery (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008, NMFS and Service 2007).

Critical Habitat

Critical habitat has not been designated for this species.

Loggerhead sea turtle

Description

The loggerhead sea turtle was listed as threatened throughout its entire range on July 28, 1978 (43 FR 32800). This species is widely distributed and can be found hundreds of miles offshore. It is known to occur in Alabama, American Samoa, California, Connecticut, Delaware, Florida, Georgia, Guam, Hawaii, Louisiana, Massachusetts, Maryland, Northern Mariana Islands, Mississippi, North Carolina, New Jersey, New York, Oregon, Puerto Rico, Rhode Island, South Carolina, Texas, Virginia, Virgin Islands, Palau, and other beaches along tropical and temperate seas.

It occurs in temperate and tropical waters of both hemispheres. This species inhabits the continental shelves and estuarine environments, bays, lagoons, salt marshes, ship channels and mouths of large rivers along the margins of the Atlantic, Pacific, and Indian oceans. The loggerhead sea turtle is characterized by a large head with blunt, powerful jaws. The upper shell and flippers are a reddish-brown color with a yellow lower shell. The upper shell has five pairs of costal scutes, or plates in the middle of the shell, with the first touching the plate just behind the head. Adults grow to an average weight of about 200 pounds (90.7 kilograms). Hatchlings lack the reddish tinge and vary from light to dark brown dorsally. Both pairs of flippers are dark brown above and have distinct white margins. The plastron and other ventral surfaces are dull, yellowish tan.

Life history
Loggerheads nest in the continental U.S. from Texas to Virginia, although the major nesting concentrations are found in Florida, Georgia, South and North Carolina. About 80 percent of loggerhead nesting in the continental southeastern U.S. occurs in six Atlantic coast Florida counties: Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward (NMFS and Service 1991b).

Loggerheads are predominantly nocturnal nesters. The continental U.S. nesting season extends from about May through August. Preferred nest sites are sloping beaches 1.5 to 2.5 feet (.76 meters) above waterline. They are known to nest from one to seven times within a nesting season (mean is about 4.1 nests per season) at intervals of approximately 14 days. Mean clutch size varies from about 100 to 125 eggs along the southeastern U.S. coast (NMFS and Service 1991b). Incubation ranges from about 45 to 95 days, depending on incubation temperatures, but averages 55 to 60 days for most clutches in Florida. Hatchlings generally emerge at night. Remigration intervals can vary from 1 to 7 years for nesting loggerheads, but 2 to 3 years is the most common. Age at sexual maturity is believed to be between 25 to 30 years.

Most loggerhead hatchlings originating from continental U.S. beaches are believed to lead a pelagic existence in the North Atlantic Gyre, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating at sea in association with sargassum rafts. Once they reach a certain size, juvenile loggerheads begin recruiting to coastal areas in the western Atlantic where they become benthic feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. Such juveniles occupy coastal feeding grounds for a decade or more in the neritic zone, not exceeding a depth of 656 feet (200 meters), before maturing and making their first reproductive migration; females will return to their natal beach to nest.

Predation of hatchlings and young turtles is assumed to be significant, and predation of subadult through adult stage turtles is assumed to be less common (NMFS and Service 1991b). Stancyk (1982) however, reported predators of juvenile and adult turtles to include at least six species of sharks, killer whales, sea bass and grouper. Tiger sharks appear to be the principal predator of subadult and adult turtles.

Although the loggerhead's diet includes a variety of marine invertebrates (sponge and jellyfish) and plants, it primarily feeds on mollusks (scallops, shellfish and queen conch), crustaceans (crab), and sargassum plants. Loggerheads may scavenge fish or fish parts or ingest fish incidentally in some circumstances (NMFS and Service 1991b).

The NPS program initiated in 1986 to detect, monitor, and protect Kemp's ridley nests at PAIS (see Kemp's ridley section) has expanded to include the other four species of sea turtles that occur along the Texas coast. Detection for all the species of sea turtles involves patrols to look for nesting activity, public education and investigation of reports from patrols, beach workers, in-park contractors, and the public. Patrols (NPS staff members and volunteers) use ATVs to search PAIS and the adjacent northern area of Kleberg County Beach for sea turtle tracks and nesting turtles. Each day, from April through mid-July, they repeatedly patrol the entire Gulf beachfront of PAIS during daylight hours. The patrol season and procedures are designed primarily to detect nesting by Kemp's ridley turtles, but the other sea turtle nests have also been documented as a part of the patrols and reports from the public. Daily runs to the Port Mansfield Channel and back are scheduled from mid-July through August to look for signs of nesting activity of loggerheads, greens, leatherbacks, and hawksbills, but these patrols are subject to funding and staff availability and thus are not conducted every year.

Population Dynamics

In the continental U.S., the population of loggerheads has declined, but most of that decline occurred prior to 1979. There has been no significant decline in recent years (Turtle Expert Working Group 1998; 2000). Loggerheads take approximately 25 to 30 years to mature so the effects of decline in immature loggerheads might not be apparent on nesting beaches for decades. Of the 722 sea turtle nests found on the Texas coast between 1979 and July 2008, 46 were loggerhead sea turtle nests, of which 36 were found on PAIS, and it is possible that a few were left undetected (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2007). Nesting surveys along Texas beaches that typically occur annually from April through mid-July to locate Kemp's ridleys would only locate loggerheads that nest during that time and would miss those that nest later. If nests are detected, all sea turtle eggs are excavated, transferred to the incubation facility at PAIS and then the hatchlings are released on the beach at PAIS and allowed to return to the Gulf of Mexico. In addition to patrolling for all nesting turtles NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Status and Distribution

Reason for Listing:

Threats to loggerhead populations include loss or degradation of nesting habitat from coastal development and beach armoring, beach nourishment, disorientation of hatchlings by beachfront lighting, excessive nest predation by native and non-native predators, degradation of foraging habitat, marine pollution and debris, watercraft strikes, disease, and incidental take from channel dredging and commercial trawling, longline, and gill net fisheries (NMFS and Service 1991b). There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

The fluctuating migratory patterns of the loggerhead make it a concern for numerous countries, some of which lack regulations regarding impacts towards the species. Conservation efforts to lessen threats include improvements to Turtle Excluder Devices (TED), regulations for incidental take among fisheries, and management of favorable coastal and marine habitat (NMFS and Service 1991b).

Range-wide Trend:

Hildebrand (1981) suggested that loggerhead nesting along the Texas coast has occurred within the last 300 years, but the earliest loggerhead nest that he was able to confirm for Texas was found in 1977. Total estimated loggerhead nesting in the southeastern U.S. is approximately 50,000 to 70,000 nests per year (NMFS and Service 1991b). From a global perspective, the southeastern U.S. nesting aggregation of loggerhead sea turtles is important to the survival of the species and is second in size to nesting in the Arabian Sea off Oman (Ehrhart 1989; NMFS and Service 1991b; Ross 1995). The status of the Oman colony has not been evaluated recently, but its vulnerable location for disruptive events such as catastrophic oil spills is a cause for considerable concern (Meylan, et al. 1995). The loggerhead nesting aggregations in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (NMFS and Service 1991b).

Critical Habitat
Critical habitat has not been designated for this species.

Green sea turtle

Description
The green sea turtle was listed as endangered in the breeding colony populations in Florida and on the Pacific coast of Mexico under the Act on July 28, 1978 (43 FR 32800). All other populations are listed as threatened. The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green sea turtle nesting colonies in the Atlantic occur in Florida, Mexico, Ascension Island, Aves Island, Costa Rica, and Surinam (NMFS and Service 1991a).

Adult green sea turtles can grow to a shell length of 4 feet (1.2 meters) and range from 250 to 450 pounds (113.3 to 204.1 kilograms). The adult's carapace is smooth, lacks a keel and is light to dark brown with dark mottling. Green sea turtles are long-distance migrants and are occasionally seen in open sea en route from feeding grounds to nesting beaches or vice versa. They occupy three habitat types: high-energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in relatively shallow, protected waters. They are generally found in shallow waters (except when migrating) inside reefs, bays, estuaries, rock passes, and inlets, especially sea grass beds. Favored habitat appears to be lagoons and shoals with an abundance of sea grass and algae. Green sea turtles have been documented in large numbers at Packery, Mansfield, and Brazos Santiago passes. There have also been many observations at Fish Pass Jetties and the jetties for the Aransas Pass ship channel.

Life History
Open beaches with sloping platform and minimal disturbance are required for green sea turtle nesting. A variety of sands can be used for nesting, but must be loose and well drained. Female green sea turtles nest at night and deposit egg clutches on high-energy beaches, usually on islands, where a deep nest cavity can be dug above the high water line. One to seven clutches are deposited within a breeding season (the average number is usually two to three clutches) (NMFS and Service 1991a). Average clutch size is usually 110-115 eggs with incubation lasting 48-70 days. Hatchling emergence occurs at night. Nesting sites include locations in southern Florida and scattered locations in Mexico, although nesting occasionally occurs in south Texas. Adults reach sexual

maturity between 8 and 13 years of age and can have a life span of 30 - 50 years (TPWD 2007).

Hatchlings leave the beach and apparently move into convergence zones in the open ocean where they spend an undetermined length of time. When turtles reach a shell length of approximately 8-10 inches (20-25 centimeters), they leave the pelagic habitat and enter benthic-feeding grounds (NMFS and Service 1991a). Usually, these foraging habitats are pastures of sea grasses and/or algae, but small green sea turtles can also be found over coral reefs and rocky bottoms. Some feeding grounds only support certain size classes of green sea turtles; the turtles apparently move among these foraging areas as they grow. Coral reefs or rocky outcrops near feeding pastures are often used as resting areas, both at night and during the day.

Population Dynamics

Within the U.S., green sea turtles nest in small numbers in the U.S. Virgin Islands, Puerto Rico, and Texas, and in larger and growing numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (NMFS and Service 1991a). Growing numbers of nest have been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia counties) and from Pinellas County through Collier County (Service 2003b), but smaller numbers nest in Georgia, North Carolina and Texas. The first documentation of green sea turtle nests in South Carolina was reported in 1996 (Service 2003b). Unconfirmed nesting of green sea turtles in Alabama has also been reported (Service 2003b).

Scattered nesting occurs in the U.S. Pacific, the Commonwealth of the Northern Marianas, Guam, and American Samoa (NMFS and Service 1991a). In the western Pacific, the largest green sea turtle nesting aggregation in the world occurs on Raine Island, Australia, where thousands of females nest nightly in an average nesting season. In the Indian Ocean, major nesting beaches occur in Oman, where 6,000 to 20,000 females are reported to nest annually. Populations in Surinam and Costa Rica may be stable, but there is insufficient data for other areas to confirm a trend.

Status and Distribution

Reason for Listing:

Green sea turtles have been adversely affected by both direct harvest and degradation of nesting habitat. The eggs and succulent meat of this species have provided a dietary staple for humans in many regions, and epicures have relished green sea turtle soups and steaks for ages (Palmer and Braswell 1995). A green sea turtle fishery, operating almost exclusively within inshore waters (bays, estuaries, passes), began in Texas in the mid-1800's. By the early 1900's, the catch declined to such an extent that the turtle fishing and processing industry collapsed (Hildebrand 1981). Effects from channel dredging and commercial trawling, long line and gill net fisheries, the loss and degradation of nesting habitat from continued coastal development and beach stabilization, sediment disposal on beaches and beach grooming, disorientation of hatchlings by beachfront lighting, increased recreational activities on the beach (e.g., off-road vehicles), excessive nest predation by native and non-native predators, degradation of foraging habitat, marine pollution and debris, watercraft strikes, and disease have contributed to the decline of the green sea turtle population (NMFS and Service 1991a). Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green sea turtle populations in Florida, Hawaii, and other parts of the world (NMFS and Service 1991a). The tumors interfere with swimming, eating, breathing, vision and reproduction (NMFS and Service 1991a). Hypothermic stunning is another significant threat to green turtle survival in the U.S. (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

Range-wide Trend:
The primary nesting sites for green sea turtles in U.S. Atlantic waters are along the east coast of Florida, with additional sizeable sites in the U.S. Virgin Islands and Puerto Rico. Total population estimates for the green sea turtle are unavailable, and trends based on nesting data are particularly difficult to assess because of wide year-to-year fluctuations in numbers of nesting females, difficulties of conducting research on early life stages, and long generation time. Although historic nesting by green sea turtles on the Texas coast was suspected, the first confirmed nest was not documented until 1987 (Shaver 2000). Of the 722 sea turtle nests found on the Texas coast between 1979 and 2008, 26 were green sea turtle nests, 25 of which were found on PAIS and one on South Padre Island, although it is possible that a few were left undetected (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Sea turtles were not monitored for nesting activity at PAIS until 1986 and limitations in staff and funding reduced coverage during early patrol years and never enabled coverage during the entire green turtle nesting season. If nests are detected, all sea turtle eggs are excavated transferred to the incubation facility at PAIS and then the hatchlings are released on the beach at PAIS and allowed to return to the Gulf of Mexico. In addition to patrolling for all nesting turtles NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Critical Habitat
NMFS designated critical habitat for the green sea turtle on October 2, 1998. Critical habitat included waters extending seaward 3.5 miles (5.6 kilometers) from the mean high water line of Isla de Culebra (Culebra Island, Puerto Rico). Critical habitat has not been designated in Texas.

Piping plover

For the purpose of this BCO, discussions will be focused on the Texas wintering piping plover population and its designated and proposed to be designated critical habitat.

Description
The piping plover was federally listed as endangered in the Great Lakes watershed, and as threatened elsewhere in its range, on January 10, 1986. The piping plover is a small Nearctic (i.e., North American) shorebird approximately 7 inches (17.7 centimeters) long with a wingspread of about 15 inches (38.1 centimeters). Breeding birds have white underparts, light beige back and crown, white rump, and black upper tail with a white edge. In flight, each wing shows a single, white wing stripe with black highlights at the

wrist joints and along the trailing edges. Breeding plumage characteristics are a single black breastband, which is often incomplete, and a black bar across the forehead. The black breastband and brow bar are generally more pronounced in breeding males than females. The legs and bill are orange in summer, with a black tip on the bill.

Life History

Piping plovers breed only in North America within three geographic regions encompassing three distinct breeding populations: the Northern Great Plains, the Great Lakes, and the Atlantic Coast. The winter ranges of the different breeding populations overlap making it impossible to distinguish the source population of a wintering bird unless it has been banded or marked on the breeding grounds. The piping plover's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (Service 1985).

Southward migration to the wintering grounds along the southern Atlantic coast and Gulf of Mexico shoreline extends from late July, August, and September. Individuals can be found on their wintering grounds throughout the year, but sightings are rare in May, June, and early July (Service 2003a). In general, wintering piping plovers forage mostly on benthic invertebrates, insects, and crustaceans found within the intertidal areas of ocean beaches, washover areas with no or very sparse emergent vegetation, mudflats, sandflats, wrack lines; and shorelines of coastal ponds, lagoons or salt marshes. Roosting areas may be unvegetated or sparsely vegetated and may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers depend on a mosaic of sites distributed through the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change.

Population Dynamics

The coast of Texas is a major wintering area for piping plovers and may provide habitat for about 55 percent of birds found during winter censuses where birds spend up to 75 percent of their annual cycle (Nicholls and Baldassare 1990, Haig and Plissner 1993, Drake 1999). A consistent finding of all analyses of the demographic factors affecting the persistence and/or extinction of piping plover populations (Melvin and Gibbs 1994; Plissner and Haig 2000) is that vulnerability to extinction is greatly increased by even small declines in survival rates. Modeling by Melvin and Gibbs (1994), for example, postulated approximately four-fold increases in the likelihood of extinction of the Atlantic Coast piping plover population when survival rates of adults and juveniles declined by as little as 5 and 10 percent, respectively, and other parameters were held constant. Since piping plovers spend 55 to 80 percent of their annual cycle associated with wintering areas, factors that affect their well being on the wintering grounds could substantially affect their survival and recovery (Service 1996).

Status and Distribution

<u>Reason for Listing:</u>

The Atlantic Coast Piping Plover Recovery Plan (Service 1996) calls for the protection of all known wintering habitat by preventing habitat degradation and disturbance, including direct and indirect impacts of shoreline stabilization, navigation projects, development, disturbance by recreationists and their pets, and contamination and degradation due to oil or chemical spills. In addition, the plan addresses the need to identify important migration stopover habitat and mitigate any factors that may adversely affect these areas. Factors that must be considered include: (1) disturbance depleting the birds' energy reserves, and (2) effects on prey availability that may last long after the completion of a given action.

Overall, winter habitat loss is difficult to document; however, a variety of human-caused disturbance factors have been noted that may affect plover survival or utilization of wintering habitat. Those factors include recreational activities, inlet and shoreline stabilization projects, dredging of inlets that can affect spit formation, beach maintenance and renourishment, and pollution. In some areas, natural erosion of barrier islands may also result in habitat loss.

Barrier beach habitats preferred by wintering piping plovers are dynamic, storm-maintained ecosystems (Service 1996). The construction of houses and commercial buildings on and adjacent to barrier beaches directly removes plover habitat and results in increased human disturbance. The impacts of shoreline development are often greatly expanded by the attendant concerns for protecting access roads. Legal restrictions on coastal development may slow the future pace of physical habitat destruction.

A decrease in suitability of the species' habitat due to accelerating recreational activity and development along the Atlantic Coast also threatens the plover. Habitat loss occurs when high human and/or animal use precludes the birds from successfully nesting. Habitat loss can also occur when man-made activities and operations (i.e., sand disposal, inlet dredging, etc.) cause birds to flee protective habitats and use valuable energy reserves.

Range-wide Trend

Human population growth along the U.S. coast creates an ever-increasing demand for beach recreation. In 1993, 32 percent of the U. S. Atlantic Coast population of piping plovers nested on federally-owned lands where some protection from development (Service 1996). The situation in the plover's Atlantic Coast wintering range is similar; 37 percent of the shoreline recently proposed for designation as critical habitat for wintering piping plovers in North Carolina, South Carolina, and Georgia is federally-owned, while 63 percent is in State and private ownership (65 FR 41782). Pressure from development and human disturbance on Atlantic Coast beach habitat continues, and the recovery plan emphasizes that piping plover habitat protection efforts must recognize and seek to perpetuate the natural dynamism of these barrier systems (Service 1996).

Critical Habitat

Critical habitat on the wintering grounds was designated July 10, 2001 (66 FR 36038). That designation included 137 areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, to provide sufficient wintering habitat to support the piping plover at the population level and geographic distribution necessary for recovery of that species. A total of approximately 165,211 acres (66,881 hectares) and/or 1,798.3 (2,891.7 kilometers) were designated. There were 37 critical habitat units [approximately 62,454 acres (25,285 hectares), 797.3 miles (1,283.8 kilometers)] designated in Texas that were believed to contain the essential physical and biological elements for the conservation of wintering piping plovers and physical features necessary for maintaining the natural processes that provide appropriate foraging, roosting, and sheltering habitat components.

The primary constituent elements for wintering ground critical habitat are found in geologically dynamic coastal areas that contain intertidal sand beaches and sand and mud flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide. The primary constituent elements for the wintering population of the piping plover are: 1) Intertidal sand beaches including sand flats or mudflats between annual low tide and annual high tide with no or very sparse emergent vegetation for feeding. In some cases, these flats may be covered or partially covered by a mat of blue-green algae. 2) Unvegetated or sparsely vegetated sand, mud, or algal flats above annual high tide for roosting. Such sites may have debris or detritus and may have micro-topographic relief offering refuge from high winds and cold weather. 3) Surf-cast algae for feeding, 4) Sparsely vegetated back beach which is the beach area above mean high tide seaward of the dune line, or in cases where no dunes exist, seaward of a delineating feature such as a vegetation line, structure, or road. Back beach is used by plovers for roosting and refuge during storms. 5) Spits, especially sand, running into water for foraging and roosting. 6) Unvegetated washover areas with little or no topographic relief for feeding and roosting. Washover areas are formed and maintained by the action of hurricanes, storm surges, or the extreme wave actions. 7) Natural conditions of sparse vegetation and little or no topographic relief mimicked in artificial habitat types (e.g. dredge spoil sites).

On March 20, 2006, the Texas General Land Office (GLO) challenged the designation of 19 units of critical habitat along the Texas coast (Units 3, 4, 7, 8, 9, 10, 14, 15, 16, 17, 18, 19, 22, 23, 27, 28, 31, 32, and 33). On 26 July 2006, the United States District Court, Victoria County, Texas ruled the Service must vacate, re-evaluate and reconsider the designation of these units. On May 20, 2008 (73 FR 29294) the Service revised the designation of critical habitat for wintering piping plovers in Texas in 18 specific units. The 19 vacated units totaled approximately 231,280 acres (93,596 hectares). The proposed re-designation of the 18 units totaled approximately 138,881 acres (56,206 hectares) a difference of 92,399 acres (37,392.55 ha) less than originally designated in Texas. The total designated critical habitat for all 7 states (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana) in 2001 was 102,754 acres (41,595 hectares) combined with the proposed critical habitat in Texas in 2008 equals 241,635 acres (97,801 hectares).

All areas proposed as critical habitat in Texas are currently occupied and contain sufficient primary constituent elements to support at least one life history function. The public comment period closed on July 21, 2008. Final designation is in process and was delivered to the *Federal Register* on May 8, 2009.

Environmental Baseline

Under section 7(a)(2) of the Act, when considering the effects of an action on Federally-listed species, the Service is required to consider the environmental baseline which includes past and ongoing natural factors, impacts of all Federal, State, or private actions in the action area, including Federal projects in the action area that have already undergone section 7 consultation and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

Status of the Species within the Action Area

The action area includes priority areas scheduled for beach maintenance with removal of sargassum (surf-cast algae) and roadway maintenance. The areas include the sandy Gulf beach and landward toward the dune line. Dunes may be densely to sparsely vegetated. Land ownership is State or private with most development behind the dunes. However, there are beach access roads that allow access to the action area, jetties, backbeach and washover areas.

Sea Turtles

Sea turtles sometimes inhabit the near shore Gulf of Mexico waters for foraging or migration and many are found stranded (washed ashore, alive or dead) (Shaver 1997, 1998a, 1998b, 1999a, 1999b; Shaver and Caillouet 1998). In Texas, nesting sea turtle season occurs from March 15 to October 1. Kemp's ridley turtles are historic nesters at PAIS (Hildebrand 1963, 1981, 1983; Shaver 1998a; Shaver and Caillouet 1998) with more Kemp's ridley nests consistently being found in PAIS than at any other location in the U.S. During 2006, 108 Kemp's ridley nests were documented in the United States, 5 in Florida, 1 in Alabama, and 102 on the Texas Coast. These nests were distributed along the entire Gulf of Mexico beachfront during the months of April, May, and June; the months that beach surveys were conducted most intensively.

In 2007, sea turtle stranding data for the Texas coast recorded 717 sea turtles, including 429 green turtles, 136 loggerheads, 125 Kemp's ridleys, 14 hawksbills, 1 leatherback and 12 unknown species. Over a 29-year period (1979 to 2008), 722 nests have been documented on the Texas coast.

From 1997-2008 a total of 15 Kemp's ridley nests and 1 loggerhead nest were documented within the action area. Nine nests were found along the beach and seven were located closer to the dunes. Ten nests were documented in beach maintenance Priority Area C, three in Priority Area B, and three in Priority Area A (Figure 4).

PAIS attempts to detect nests when they are laid, so that the eggs and resulting hatchlings can be protected. Beach visitors found one nest hatching outside the action area further south near Bob Hall Pier. They and others helped ensure safe passage of the hatchlings they observed, but they did not observe several of the hatchlings so it is unknown whether any of those were killed by predators or passing vehicles. Finding these and other undetected nests lends credibility to the assumption that some Kemp's nests are missed at egg laying despite intense patrolling and public education.

Piping Plover

The piping plover is a regular migrant and winter resident along the lower Texas coast (Haig and Oring 1985, Haig and Plissner 1993) and wintering birds have been reported along the length of the Texas coast. Piping plovers begin arriving on the wintering grounds in July, with some late-nesting birds arriving in September. A few individuals can be found on the wintering grounds throughout the year but sightings are rare in late May, June, and early July. They begin leaving in late February to migrate back to the breeding sites and by late May most birds have left (Haig and Elliott-Smith 2004). Individual wintering plovers tend to return to the same wintering sites year after year (Nicholls and Baldassarre 1990; Drake 1999).

International piping plover winter census was conducted and the results found 1,904 wintering piping plovers were counted in 1991, 1,333 in 1996 and 1,042 in 2001. During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW 1996). The proposed project area was included in that survey.

In summary, the piping plover may occur throughout the project area in varying numbers and concentrations depending on annual population fluctuations and depending on the time of year.

Piping Plover Proposed Critical Habitat

Critical Habitat for the piping plover wintering grounds (as opposed to breeding population Critical Habitat) has been designated in Texas by the Service (66 FR 36074—36078), some of which lies partially within the project area:

> Unit TX-8- Mustang Island Beach – This approximately 12.5 miles (20.1 kilometers), 620 ac (251 ha)gulfside unit is in Nueces County, extending northward from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas. The landward boundary is the dune line where the habitat changes from lightly vegetated to densely vegetated and the gulfward boundary is MLLW (Figure 5).
>
> This unit is a gulfside beach unit. The habitat changes from lightly vegetated sandy beach to densely vegetated. The jetty, pier and bollards are not within the boundary of the unit. The unit is in State and private ownership with a small municipal park owned and managed by the City of Port Aransas. The State land is managed by the GLO. The unit was occupied by piping plovers at the time of listing and is currently occupied. Occupancy has been confirmed by species experts at least 2 years of the last 10. Habitat in this unit includes sand flats with

little or no emergent vegetation, surf-cast algae for feeding and unvegetated or sparsely vegetated sandy backbeach and washovers for roosting, sheltering and feeding. Due to the close proximity to the City, this unit receives considerable recreational use and beach cleaning and nourishment.

Factors Affecting Species Environment and Proposed Critical Habitat within the Action Area

A wide range of past, present and ongoing beach disturbance activities occur within the proposed action area. Nourishment activities can widen beaches, change sediments and stratigraphy, alter coastal processes, plug dune gaps, and remove overwash areas. Beach scraping, which has increased in frequency in recent years, can artificially steepen beaches, stabilize dune scarps, plug dune gaps, and change sediment distribution patterns. Artificial dune systems are constructed and maintained to protect beachfront structures. Excessive recreational use of beaches and flats may also pose a threat to the species utilizing these habitats by making them unsuitable or dangerous. Jetties to the north of the action area can be green and Kemp's ridley sea turtles congregation sites at certain times, which could increase potential boat strikes and other recreational hazards such as discarded debris, fishing line, and baited hooks that could impact the turtles.

Land ownership within the action area is both public and private. Development and recreational activities such as walking, jogging, walking pets unleashed and operating vehicles increases the potential for wintering piping plovers to be impacted by loss of habitat, or interference in the roosting, resting and foraging activities and sea turtles to be impacted by disruption of nesting habitat and activities. By following the City of Port Aransas's leash law, [Sec 16-116 (f)(1)] which requires pets to be under the control of an owner or person by means of a chain, rope, cord or leash of not more than ten (10) feet (3 meters) in length (section 4-26, Port Aransas Code) may help reduce some of the impacts from pets.

Predator species, that prey on sea turtle nests and possibly injured or sick plovers, include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), and skunks (*Mephitis mephitis). They* are common within the project area may increase as garbage increases.

All of these actions or factors may have adverse effects on sea turtles and wintering, non-breeding, piping plovers critical habitat by destroying, diminishing, or altering the habitats on which they depend.

Effects of the Action

Under section 7(a)(2) "effects of the action" refers to the direct and indirect effects of an action on a species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action. The effects of the proposed action are added to the environmental baseline to determine the future baseline that serves as the basis for the determination in this biological opinion. The impacts discussed below are the Service's evaluation of the direct and indirect effects of the proposed action. Indirect effects are those caused by the proposed action that occur later in time, but are still reasonably certain to occur (50 CFR 402.02). The Service has determined that there are no interrelated or interdependent actions apart from the action under consideration.

A. Factors to be considered

Sea Turtles and Piping Plover Proposed Critical Habitat

Proximity of the action: The proposed action occurs within the nesting range of the loggerhead, green, and Kemp's ridley sea turtles and the wintering range of the piping plovers. Additionally, the proposed action would occur within one proposed critical habitat unit for wintering piping plover.

Distribution: The expected disturbance from the proposed action is likely to occur on all ocean facing beaches throughout the action area which is habitat for both nesting sea turtles and proposed wintering piping plover critical habitat.

Timing: Sargassum or seaweed occurrence peaks in May and usually starts diminishing in July. In some years, during the winter months, there is no sargassum at all in January and February (Amos 2008). Beach maintenance activities will vary depending on the season and beach conditions. It is anticipated that from April through November a mixture of seaweed and sand will be removed from the beach and 25 foot (7.62 meters) roadway and either relocated to the foredune area and placed on the surface at 10-20 foot (3-6 meters) gaps every 200 feet (61 meters) or buried in a shallow trench just landward of the MLT. From November through April, only sand will be repositioned from immediately in front of the dunes in the above mentioned manner and distributed over the beach to make it drivable. The volume of the material repositioned during each maintenance activity may vary significantly. The volume for the April-November season will be 25 feet (7.6 meters) wide and excavation will not occur any deeper than 2 inches (5.08 centimeters) deep, nor will ruts and berms be over 2 inches (5.08 centimeters).

Typically, the City does not start removing sargassum from the beach until the deposits are 4-5 inches (10.2-12.7 centimeters) thick; however in high use areas (Priority Areas A and B) during heavy tourist seasons (March –September) the City can clean sargassum from the beach every day (i.e. there is no threshold level of sargassum required for beach cleaning). The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m. Equipment and other necessary maintenance vehicles will drive above the "wet line" on the beach.

The majority of direct and indirect effects of beach maintenance on sea turtles and their nests, eggs, and hatchlings are anticipated to occur primarily during the sea turtle nesting and hatching seasons from March 15 to October 1 and during summer and fall storm events until about November 30 when post-hatchlings may wash ashore. Direct impacts to live stranded turtles may occur year round. Although sea turtle nesting surveys will be performed continuously every day from sunrise to 6:30 p.m. from March 15 to October 1, nesting events may be overlooked. Overlooked nests will not be marked and are at risk.

Similarly, undetected sea turtle nests laid late in the summer result in hatchlings emerging in the fall after October 1.

The effects of beach maintenance on proposed critical habitat are anticipated to be year round during sargassum and/or seaweed removal and roadway clearing. The majority of effects will occur during heavy tourists seasons (March-September).

Nature of the effect: Beach maintenance activities that may affect sea turtles addressed in the BCO include collisions with equipment and/or maintenance vehicles, equipment and/or maintenance vehicles disturbing or harassing nesting sea turtles or hatchlings, tire ruts impeding hatchling sea turtle migration to the sea, sand compaction or excavation of sea turtle nest sites, lighting effects, beach erosion, removal of organic food source, escarpments, fire ant infestation of nests, egg damage due to vibration; and increased vehicular, human and pet disturbance by providing more access to more beach.

The Service considered the potential affects of the proposed action on the primary constituent elements of wintering piping plover habitat within the proposed critical habitat unit (TX-8), including the potential for beach maintenance activities to alter those habitat features.

Duration: The effects of the proposed action are likely to continue year round for 5 years until which time the permit will need to be renewed.

Disturbance frequency: The frequency of disturbance will be continuous throughout the sea turtle nesting and hatching from March 15 to October 1 in the action area. Although beach maintenance will likely decline during the winter months, the frequency of disturbance will be continuous throughout the action area for piping plovers proposed critical habitat.

Disturbance intensity: The potential for disturbance to the sea turtle populations throughout the action area is high because sargassum usually is at its peak during the peak sea turtle nesting season (April, May, June). Disturbance can also occur to the nests during the day by equipment, vehicles, pedestrians or their pets; especially if those nests go undetected. Increased predator activity following human use could also increase disturbance to sea turtle nests and hatchlings.

The potential modification of proposed piping plover critical habitat throughout the action area is high, but the intensity of the modification is expected to be greatest along the gulf beach in foraging and roosting habitat.

B. Analysis for effects of the action

Sea turtles

Beneficial effects:

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Regular beach maintenance removes detritus such as human-produced garbage, barrels and old buoys as well as large natural objects such as tree trunks and sargassum which currently washes ashore in huge quantities along this shoreline. In fact, at times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to 4 feet (1.2 meters) in height and 10 to 20 feet (3-6 meters) in width. The removal of these objects, as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier to and from nesting and hatching locations on the beach and by providing a smooth crawlway.

Direct Effects:

Collisions

Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann 1977; NMFS and Service 1991a, 1991b, 1992, 1993; Ernest et al. 1998). Adult loggerhead and green sea turtles nest at night and most female Kemp's ridleys nest during daylight hours and may be caught in the morning hours on the beach at some stage of nesting: oviposition, covering the nest, or exiting and returning to the ocean. Hatchlings may also emerge at night or early in the morning from any in-situ nests possibly missed by the daily sea turtle patrols. Post hatchlings are commonly stranded in sargassum washed in by late summer and fall storm events (these post-hatchlings are often referred to as washbacks). Post-hatchling washbacks are often found dead or in a weakened state; however, efforts are made to revive or maintain live post hatchlings for subsequent release when ocean conditions are calmer. Because of the size and high volume of traffic in some areas, live post hatchlings on the beach during the day are vulnerable to being run over or raked.

Vehicle collisions with sea turtle hatchlings during the daytime have been recorded. An incident occurred in 2006, where beach visitors found a sea turtle nest on North Padre Island in Priority Area 3, about .621 miles (1 kilometer) south of Bob Hall Pier. Visitors attempted to provide safe passage of the hatchlings to the water but some hatchlings were killed. It is unknown if the cause of mortality was predation or passing vehicles. Beach visitors also found another *in situ* nest hatching on Boca Chica Beach. Visitors attempted to provide safe passage but some hatchlings were killed by passing vehicles and then later eaten by gulls. Previous to the 2006 observations, three other nests found outside of PAIS had hatchlings that were crushed and killed by passing vehicles There was also a report of a stranded turtle being hit by a vehicle on South Padre Island (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2007).

Beach maintenance will only occur between sunrise and 6:30 p.m. Routine daily patrols by certified turtle patrollers are planned between March 15 and October 1 of each year. No maintenance will be performed at night, thus reducing the already minimal chance of injuring an adult sea turtle or hatchlings that may be emerging from an undetected nest.

Compaction or Excavation of Undetected Nests

Schroeder (1994) found that even under the best of conditions, experienced sea turtle nest surveyors can misidentify about seven percent of the nests as false crawls. Also, weather, tides, and offroad recreational vehicle tracks can obscure sea turtle tracks especially after night nesting and before morning surveys, there is a potential to miss an additional number of nests.

Mann (1977) reported that driving directly above incubating egg clutches can cause sand compaction, which may decrease nest success and directly kill pre-emergent hatchlings and eggs potentially by physical crushing or collapse of the nest chamber. Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Excavation of an undetected nest by beach cleaning equipment penetrating the surface deeper than 2 inches (5.08 centimeters) could reach the top layer of the nests. This could result in the scooping up of eggs and/or eggs being broken and yolks spreading throughout the nest, ruining the rest of the nest and mortality or injury to occurring to eggs and pre-emerging hatchlings.

Data are not available on the degree that compaction by vehicle use on the beach prevents or reduces nesting success. Many factors, including speed, weight, and size of the vehicle, the timing of the event with respect to the incubation period, the depth of the eggs/hatchlings (below grade) at the time of impact, and the physical characteristics of the nest itself, will influence whether or not, and the extent to which, mortality/injury occurs. Further, there is no established relationship between the cumulative number of times a particular nests has been run over and the extent and duration of the mortality/injury event. Also confounding this analysis are other factors that may affect the viability of any particular sea turtle nest. For example, tidal inundation, storm events, predation, and accretion/erosion of sand could negatively influence a sea turtle nest deposited in areas where beach driving will continue (NMFS and Service 1991a; 1991b; 1992; 1993). For these reasons, it is not possible to quantify the impacts beach maintenance could have on the undetected nests deposited annually in areas where beach cleaning activities are to occur.

Certified turtle patrollers locate nests primarily by searching for the tracks left in the sand and locating females during their nesting activity. However, nesting turtles do not always leave visible tracks on the beach, particularly in areas with very hard packed sand, very soft and blowing sand, and thick seaweed. The passage of City maintenance vehicles and equipment could also remove sea turtle tracks, making it difficult for the monitor to find a nest for investigation and protection. For example, the first female detected nesting at PAIS during 2003 barely left any trace of tracks on the hard-packed sand at the nest site located 0.5 miles (0.8 kilometers) south of the end of the paved road. Patrol staff that arrived while the turtle was nesting, noted that her tracks and nest would not have been located if visitors had not spotted her crawling on the beach (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

From 2002-2006, all 13 Kemp's ridley nests that were found after in-situ incubation were located very high on the beach or in the dunes. In contrast, the other Kemp's ridley nests found on the Texas coast during those years were documented along the entire beach width, from the high tide line to the dunes. It is possible other nests went undetected at lower beach positions, but did not survive to hatching because of vehicular beach driving, human disturbance, predation, or tidal flushing.

The probability of impacting the nests is potentially reduced because turtle monitors remove all sea turtle eggs from nests that are detected on the beach and transfer them to the incubation facility within PAIS. Hatching success is usually substantially elevated for eggs that are transferred to this facility rather than left undisturbed.

Tire Ruts and Berms
It is reported that vehicular ruts and berms create obstacles for hatchlings moving from the nest to the ocean. Upon encountering a vehicle rut, hatchlings may be disoriented along the vehicle track rather than crossing over it to reach the water. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon. Hatchlings are detoured along vehicle ruts and are at greater risk to vehicles, predators, fatigue and desiccation. If trapped for a period of time, this could cause them to weaken, invert, or succumb due to predation, disorientation, crushing, or dehydration (Hosier et al.1981; Fletemeyer 1996; Ernest et al. 1998). The depth and slope of the ruts influence the amount of impact, with deeper and more steeply sloped ruts causing a greater impact. Hosier et al. (1981) found that 3.9 to 5.9 inch (10 to 15 centimeter) deep tracks may serve as a significant impediment to loggerhead hatchlings. Berms created in roadways for emergency vehicles during special events may also create a barrier for adult nesting turtles and impact them by making them come ashore to nest and then abandon the nesting attempt (false crawl) or choose a less than suitable nesting area.

During 2002, Kemp's ridley hatchlings were found trapped in, and immediately adjacent to, ruts caused by beach grading. These hatchlings emerged from a nest on North Padre Island, north of PAIS, and 14 were killed when passing vehicles crushed them. In 2003, three Kemp's ridley turtles were documented nesting in the vehicular roadway at PAIS, including two nests dug within visible ruts. Others have nested in ruts during other years. Nesting in these ruts renders the nesters and eggs vulnerable to crushing during the subsequent passage of vehicles.

Despite the measures of nest protection and rut and berm removal to minimize impacts to hatchling sea turtles and even with turtle surveys from March 15 through October 1 there is a possibility of nest being undetected and impacts are anticipated.

Compaction of beach sediments
Sediments surrounding the egg chamber largely influence the incubation environment of the clutch. Temperature, moisture content, and gas exchange, all extremely important factors in the development of sea turtle embryos, are influenced by sediment characteristics (Ackerman et al. 1985). Thus, hatching success, emerging success, sex ratios, and hatchling fitness (size and vitality) may be different in compact sediments than

in more loosely configured sediments of comparable grain size.

Beach driving, beach maintenance and equipment use likely contribute to sand compaction, but the additive effects of sand compaction due to vehicle traffic on nesting and reproductive success are not well understood. Operation of vehicles on the beach can cause direct impacts to the sand that can adversely affect sea turtle nesting and incubation habitat (Mann 1977; NMFS and Service 1991a, 1991b, 1992-1993; Ernest et al. 1998).

Vibration and Noise Impacts on Adults and/or Hatchlings

Vibrations and noise caused by moving City beach maintenance vehicles and/or equipment on the beach could frighten nesting turtles, causing them to false crawl (NMFS and Service 1991a, 1991b, 1992; Ernest et al. 1998). Vibrations could also harm incubating eggs, but are difficult to assess because scientific data are lacking to fully understand the level of impact on sea turtles from traffic vibrations or noise.

During 2006, 102 sea turtle nests were documented on the Texas coast with 64 of these occurring within PAIS. This record number of nests also took place with approximately 500,000 visitors coming to the park. Analyzing nesting data collected over the past 5 years for the action area, and given that most eggs are found and removed from the beach by PAIS staff and transported to an incubation facility, the potential impact of vibrations caused by City vehicles or equipment to eggs or to nests appears to be minimal.

Fire ant Infestation

Ground nesting birds and reptiles may be especially vulnerable to fire ant predation (Parris et al 2002). In 1997, observations at Cape San Blas, a coastal barrier island along the Northern Gulf of Mexico recorded 14 of 54 loggerhead nests infested with fire ants and hatchling mortality at two of the 54 nests. Upon excavation one of the two nests, fire ants were observed consuming sea turtle hatchlings that cracked (pipped) the egg shell. In the second nest, fire ants were observed consuming an undetermined number of pipped eggs and skeletonizing five hatchlings before emergence from the nests (Parris et al 2002). In 1998, one observer recorded a hatchling being consumed by fire ants near the nest surface. Injuries included blinding due to removal of eyes and wounds to head and flippers from necrotizing fire ant stings. The increased incidents of fire ant induced mortality of loggerhead sea turtle hatchlings may directly affect the survival of the young. In Texas, a sea turtle nest was found near the foredune where sargassum and sand had been dumped during beach cleaning activities that had been infested with fire ants. The nest was fortunately found before any injuries or mortality occurred (pers. comm. D. Shaver to M. Orms 2008). Measures to potentially reduce this occurrence during beach maintenance activities includes spacing the placement of the sand and sargassum in 10-20 foot (3-6 meters) gaps every 200 feet (61 meters) to allow the turtle to traverse the area for nesting opportunities and to reduce the amount of sargassum that may attract fire ants.

Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur.

Lighting
Those species of sea turtles that nest primarily at night (green, loggerhead) are likely to be the most affected by night driving and associated lighting. Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and Service 1991a, 1991b; Fletemeyer 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Modification of Habitat
Driving on the beach is an established tradition in Texas and to maintain useable road surface, blading and scraping is used. In some parts of the U.S. this action is used to protect dunes and structures, but in Texas it provides continued driving access to the beach. Kana and Svetlichny (1992), state that scraping of "surplus" sand and placing it at the toe of the dunes helps protect them but should only be used as a temporary measure.

Beach maintenance activities can also remove significant quantities of sand and alter grain size. Because seaweed helps prevent the loss of finer sediments to the wind, groomed beaches tend to have a slightly coarser texture (Stauffer 2008). Beach maintenance activities such as raking and blading can modify sea turtle habitat by compacting the sand, unstablizing the dunes, creating ruts, berms and escarpments and also providing additional access to the beach and vehicular movement along the beach. Each impact can potentially resulting in the death or injury of nesting sea turtles, nests, and hatchlings. However, as stated above, it is impossible to determine long term effects in short studies due to the many factors that may be involved (location, winds, currents, tidal influx, sand grains, amount of sargassum, etc.).

Sea Turtles Response to Proposed Action

Sea turtles are relatively sensitive to changes in the nesting environment. The ratio of false crawls to nests increases in beach areas with higher vehicle use than in areas with limited or no vehicle access. The ratio of nests to false crawls on undisturbed beaches is about 1:1 (Dodd 1988). Sea turtle eggs are also sensitive to the nesting environment. The sex of an embryonic sea turtle is determined by the temperature of the nest environment. Vehicle use on the beach may change the nest environment by altering sand compaction and gas diffusion, which may in turn affect temperature.

Due to the PAIS' Sea Turtle Program, nesting has increased along the Texas and Mexico coast and is expected to continue to rise. However, that rise in numbers could be compromised with increased impacts from beach maintenance activities, development, nourishment projects and recreational use. It is possible that nesting numbers, and subsequently the number of hatchlings produced, could decline, and then the population may suffer (pers. comm. D. Shaver to M. Orms 2008).

Sea turtles reach sexual maturity at different ages depending on the species. Leatherback and Kemp's ridley turtles can reach sexual maturity as early as 10-15 years of age. However, loggerhead and green sea turtles do not reach sexual maturity until 20 to 50 years of age. If there is a reduction in the number of nests laid along the Texas coast, and subsequently the number of hatchlings produced, then it may take decades before those hatchlings are contributing reproductively to the population. Conservation efforts on Mexican beaches began in the mid-1960's and the population continued to decline to the low point in nests in 1985 (i.e. about 20 years). Currently there is about a 14 percent per year increase in nesting in Mexico because of ongoing conservation measures. The increase in the number of nests per year is slightly larger in Texas. However, in Texas we have more variables (changes in patrol coverage and public education to get reports) and this complicates calculating a recovery rate accurately here. Therefore, the general recovery rate of sea turtles is slow, but the specific recovery rate in the action area is unknown.

Piping Plover Proposed Critical Habitat Analysis

In this BCO, the key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the wintering piping plover and would retain the current ability for the physical and biological features to be functionally established. Activities that may destroy or adversely modify critical habitat are those that alter the physical and biological features to an extent that appreciably reduces the conservation value of all proposed and designated critical habitat for the winter piping plover.

Primary Constituent Elements
The primary constitute elements (PCEs) determined essential for conservation of wintering piping plovers are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. The PCEs for wintering ground critical habitat are found in geologically dynamic coastal areas that contain intertidal sand beaches and sand and mud flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide.

The PCEs in Unit TX-8 consist of sand flats with little or no emergent vegetation, surf-cast algae (sargassum or seaweed) for feeding, and unvegetated or sparsely vegetated sandy backbeach and washovers for roosting and sheltering and for feeding. Sand or mud flats adjacent to unvegetated or sparsely vegetated sand, mud or algal flats above the high tide are important for roosting piping plovers. These sites have debris, detritis (decaying organic matter), or microtopographic relief (less than 19.7 inches (50 centimeters) above substrate surface) offering the plovers refuge from high winds and cold weather. Sparsely vegetated backbeach (beach area above mean high tide seaward of the dune line or seaward of a delineating feature such as a vegetation line, structure or road) is also used for roosting and refuge from storm events. Surf-cast algae is important for feeding on prey. Washover areas, broad, unvegetated zones with little or no topographic relief and are formed and maintained by hurricanes, storm surges and other extreme wave actions are used for both feeding and roosting.

Proposed Critical Habitat Units and Priority Areas
A portion of proposed, occupied, critical habitat unit TX-8 is within the action area and will be disturbed by beach maintenance activities. TX-8 totals approximately 620 acres (251 hectares) or 12.5 miles (20.1 kilometers). However, only a total of approximately 256 acres (103.5 hectares) or 7 miles (11.3 kilometers) out of a total of 241,635 acres (97,801 hectares) of designated and proposed critical habitat distributed over 8 states is within the action area and includes Priority areas A, B, and C

Factors Affecting Undesignated, Designated and Proposed Critical Habitat

<u>Removal of organic matter and food source</u>
Beach wrack accumulates at the top of the intertidal zone. "Wrack" is the buildup of debris that consists of seagrass/weed or sargassum, marine organisms and other material deposited on the beach with the tides and waves (Noriega and Schlacher 2007). The wrack provides food and habitat for shorebirds and invertebrates (McKenna 2006). Mechanical cleaning provides a beach free of trash and natural debris can disrupt the natural ecological process and modify the function of the structure of the beach ecosystem and remove an important component of the food chain (Noriega and Schlacher 2007).

Withers studied beach raking effects on invertebrate fauna on PAIS in1997 (Englehard and Withers 1997). She only looked at beach raking because that is the only type of cleaning PAIS allows on the closed beach. She looked at shrimp near the surfline and sandhoppers in the wrack lines, polychete worms and a variety of insects. Sargassum and detritus were a major food source for the invertebrates. She found that sand hoppers were affected in the wrackline but not differently from the control after 10 days. Haustoriid amphipods were unaffected but nearshore insects, *Orchestia* amphipods and polychetes took longer to recover their numbers after raking. Raking of sargassum probably decreased food for shorebirds in the short term but recovered by day 14. She also found that June and July are when the human visitation was the highest at PAIS and the shorebird populations are down, so they would probably not be affected by decrease of food. Plover migration is greatest before and after sargassum influx (May, June, July), although early in the migration when sargassum is still in place and during late months prior to migration, raking may limit the food source available in the proposed critical habitat unit.

Beach maintenance activities may temporarily displace plovers causing them to move to other suitable nearby locations where these activities are not occurring. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements.

Beach Erosion

The Texas Bureau of Economic Geology (BEG) determines shoreline erosion. Trends may change as the shoreline is in constant flux due to the dynamics of sediment supply, long-term relative sea level rise, and episodic storm events. The BEG compares the elevation information from a mapping technique called Light Detection and Ranging (LIDAR) surveys with historical shorelines to calculate annual rates of shoreline change. When the long-term (1800's and 1930's to 1980's and 2000) shorelines were compared, the Gulf beaches of Mustang Island and North Padre Island showed they were experiencing net erosion (McKenna 2006). Beach maintenance activities and removal of sargassum narrows beaches from the foredune, changes the grade of the foredune, weakens dunes by covering the vegetation matting, decreases the beach elevation and alters the beach profile (Conti 2008). Backstacking material and placing the material between the dune ridges may strengthen and heighten the dunes (Watson 2008).

A study on the west and east end of Galveston Island analyzed elevation changes of a one year period on raked and unraked beaches. Results indicated that there is not a statistically significant difference in elevation changes between the raked and unraked beaches over a one year time (Williams et al 2007). It also indicated that birds and other terrestrial species on the beach are more dependent on the fresh influxes of sargassum than the older deposits of sargassum on the high tide line; therefore beach raking may not cause detrimental environment impacts to avian and other fauna on the beach. However, it also stated that longer studies for a longer period of time may be able to show some effects on elevation and whether birds use the sargassum wrack for nesting, camouflage, or social aggregation. Avian studies should extend the time period into morning, afternoon, and night observations. Other factors that may result in other conclusions may be that the sand movement may be from a different location depending on the location of the project (Williams et al 2007).

Inlet Dredging and Dredge Spoil

Inlet dredging and artificial structures, such as breakwalls and groins, can eliminate wintering areas and alter sedimentation patterns leading to the loss of nearby habitat (Service 2003a). Deposition of dredge spoil, a practice occasionally considered beneficial to piping plovers and used to mitigate effects of habitat destruction, may actually be detrimental depending on placement. In Texas, piping plovers avoid islands of dredged material in favor of natural habitats (Zonick et al. 1998). In the Laguna Madre, these artificial islands impede water flow between tidal flats and the lagoon, resulting in vegetation encroachment that lowers the quality of important foraging habitat for piping plovers (Zonick et al. 1998).

Vehicular Traffic and Recreational Use

In Texas beach driving is allowed in many areas of the wintering grounds from the mean low tide line to the line of vegetation on the shore. Zonick and Ryan (1996) found that in Texas, human disturbance continues to decrease the amount to undisturbed habitat and appears to limit local piping plover abundance. Beach maintenance to remove sargassum and improve roadways may allow for the increased human disturbance on proposed critical habitat. Increased vehicular access may result in increased ruts, berms, and trash that could increase the expected timing and frequency of maintenance activities that could expose critical habitat to further erosion and removal of organic matter and food sources. However, without properly monitoring vehicular use within the action area for a sustained period of time with and without beach maintenance it would be difficult to determine if beach maintenance actually increases human and vehicular use.

Proposed Critical Habitat Response to Proposed Action

Adult survival is key to the continued and long term existence of the piping plover and to stepwise improvement toward meeting its recovery criteria. Protecting the wintering grounds allows adult piping plovers to maintain adequate body so they survive the winter and can migrate back to nest in the spring. Broad management actions on the wintering grounds include protection of resting areas, designation of important shorebird wintering sites and regular shorebird surveys. TX-8 unit continues to support PCEs essential for the conservation of the species with the current levels of human use and existing management. Continued beach maintenance within this unit may reduce the suitability of the habitat for wintering piping plover. The total of approximately 256 acres (103.5 hectares) or 7 miles (11.3 kilometers) being disturbed within the proposed action area represents about .10 percent of the total designated and proposed critical habitat units [241,635 acres (97,801 hectares)]. Considering the effects of beach maintenance activities being authorized by the issuance of SWG-2007-01847 on the one proposed unit, together with the effects on the other 134 previously designated or proposed units the overall effect on proposed and designated wintering piping plover critical habitat is expected to be minimal.

Cumulative Impacts

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this BCO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative impacts to nesting sea turtles would result primarily from vehicle access along the Gulf beach from the public and possible commercial operations. The greatest potential for a direct, adverse impact would occur from non-City related vehicle traffic crushing a nesting turtle or an undocumented nest or emerging hatchlings, or causing hatchling mortality due to vehicle rutting. The risk of impacting night-nesting, rarely occurring loggerhead and green sea turtles is minimized because of the limited possibility of encountering one on the seashore, although the risk may be slightly higher for the Kemp's ridley because of their increased numbers. As night driving by the City is restricted during the sea turtle nesting season, the chance of injuring an adult is remote, especially for the loggerhead and green sea turtles. The risk to emerging sea turtle hatchlings and undetected nests laid during the night will be reduced by the initial surveys performed by certified turtle patrollers in the morning prior to any City equipment entering the site to be cleaned.

Additional development or other activities occurring within the action area may occur without Federal authorization. Continued development may increase the number of visitors to the area (increasing vehicles, pedestrians, pets, and predators) which will have associated effects to Federally-listed species within the action area. Such actions include increased lighting from development that may affect the sea turtle nesting habitat of the beachfront, or increased predators associated with people.

IV. Conclusion

Sea Turtles

Avoidance and minimization measures such as the PAIS Egg Relocation Program, beach patrols, certified turtle monitors, reducing vehicular beach cleaning activity, establishing protocols for notification, scheduling maintenance work, improving beach conditions, does not remove all potential impacts but do reduce the likelihood of sea turtle impacts occurring. Therefore, after reviewing the current status of the Kemp's ridley, loggerhead and green, sea turtles, the environmental baseline for the action area, 7 miles (11.3 kilometers) of ocean front beach within the priority action areas, the effects of the proposed City beach cleaning activities permitted by the USACE and the cumulative effects, it is the Service's biological opinion that the permitting of SWG-2007-01847, as proposed is not likely to jeopardize the continued existence of the listed Kemp's ridley, loggerhead and green nesting sea turtle species under the Service's jurisdiction. There is no critical habitat listed in the state of Texas for these species of sea turtles, therefore none will be affected.

Proposed Piping Plover Critical Habitat

The proposed TX-8, is occupied and totals 620 acres (251 hectares) or 12.5 miles (20.1 kilometers. Approximately 256 acres (103.5) and 7 miles (11.3 kilometers) of the proposed critical habitat unit will be disturbed by beach maintenance activities, representing approximately .001 percent of the total 241,635 acres (97,801 hectares) of designated and proposed critical habitat distributed over 8 states is within the action area. Therefore, after reviewing the current status of the wintering piping plover, the environmental baseline for the action area, the effects of the proposed issuance of SWG-2007-01847 and the cumulative effects, it is the Service's conference opinion that the proposed action is not likely to significantly destroy or adversely modify proposed critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the USACE so that they become binding conditions of any grant or permit or project agreement issued to the City as appropriate, in order for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered by this incidental take statement. If the USACE (1) fails to assume and implement the terms and conditions or (2) fails to require the City to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the USACE must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement (50 CFR 402.14(i)(3)).

Amount or Extent of Take Anticipated

Sea Turtles

Based on the review of biological information and other information relevant to this action, incidental take is possible in the form of harassment, injury, and/or death from:

1. Beach maintenance vehicles and/or equipment driving over an adult sea turtle, hatchling, stranded or post-hatchling washback sea turtles and/or eggs from an undetected, unmarked/unprotected sea turtle nest,

2. Beach maintenance vehicles or equipment causing the loss of a nest or individual eggs by compaction, excavation, or vibration,

3. Hatchling sea turtles emerging from undetected, unmarked/unprotected nests and subsequently caught in vehicle ruts created by beach cleaning activities in areas where no rut removal has taken place,

4. Disorientation of adults and/or hatchlings by mobile or stationary lights, or

5. Behavior modification or physiological stress during the adult turtle's attempt to nest and potentially increasing the number of false crawls during the nesting season or situations where they choose marginal or unsuitable nesting areas to deposit eggs.

The Service anticipates that incidental take of hatchlings and eggs will be difficult to detect for the following reasons: (1)(a) turtle nests are difficult to find, especially for greens and loggerheads, which are primarily nocturnal nesters, (b) natural factors, such as rainfall, wind, and tides may obscure crawls, and (c) human-caused factors, such as pedestrian traffic, may obscure crawls, resulting in nests being destroyed because they were missed during the nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beaches and be forced to nest in less optimal areas; and (5) lights may disorient an unknown number of hatchlings and cause death. However, the level of take of sea turtle adults, nests, hatchlings and eggs can be anticipated because: (1) 16 sea turtle nests were documented within the action area from 1997 to 2008; (2) recent data documented 13 undetected Kemp's ridley nests outside the project area.

As stated previously, between 1979 and 2008, a 29-year period, 722 nests have been recorded along the Texas coast with 16 sea turtles occurring within the action area (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Beach maintenance activities will occur more intensely in Priority Areas A and B. There were 3 nests found in Priority Area A and 3 in Priority Area B. Priority Area C had the highest number of sea turtle nests, 10, over a 12 year period, however it is the area that will receive the least beach maintenance (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). The Service anticipates the proposed project could potentially "take" a maximum of 16 nesting sea turtles prior to any avoidance and minimization measures being implemented. Implementation of avoidance and minimization measures by the USACE and the City further reduces the estimated number of sea turtles that could be taken. If these measures are to be deviated from, the USACE and the city must contact the Service. The Kemp's ridley is the most frequently documented sea turtle occurring in the action area and the loggerhead is a very infrequent second. Thus, the potential for beach maintenance activities interacting with Kemp's ridley adults, hatchlings or nests would be greater, thus the number of Kemp's ridley adults, hatchlings and nests at risk of "take" would also be greater.

Therefore, the Service anticipates that, despite avoidance and minimization measures implemented throughout the life of the project during beach cleaning, a risk still exists, although minimal, that nests could go undetected by the egg relocation program surveys within the proposed action area and:

1) 3 Kemp's ridley sea turtle nests per year, including all hatchlings and/or eggs (approximately 100 to 110 eggs per nest) could be taken.
2) 1 loggerhead sea turtle nest per year, including all hatchlings and/or eggs (approximately 100 to 125 eggs) could be taken.
3) 1 green sea turtle nest per year, including all hatchlings and/or eggs (approximately 110 to 115 eggs) could be taken.

If the agreed upon avoidance and minimization measures are deviated from or if the level of take is reached for any one of the species, we request that the USACE contact the Service immediately to review the circumstances and revisit the take analysis. Although incidental take is anticipated for three Kemp's ridley nests per year, if one nest is taken the Service also would appreciate the opportunity to review the circumstances and the avoidance and minimization measures.

Effect of Take

In the accompanying BCO, the Service determined that this level of anticipated take is not likely to result in jeopardy to sea turtles, or destruction or adverse modification of designated or proposed piping plover critical habitat.

REASONABLE AND PRUDENT MEASURES

As detailed in the project description, the USACE and the City have agreed on voluntary measures to avoid and minimize impacts to sea turtles and piping plovers. The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impact of incidental take on sea turtle species and assist the Service in improving methods to minimize impacts of incidental take on these listed species.

1. Establish a protocol to notify the Service immediately of direct take of a sea turtle, excavated eggs, or an undetected nest.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the USACE must comply with the following terms and conditions, which implement the reasonable and prudent measure, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. In the event that activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the Service's Corpus Christi Ecological Services Office (361/994-9005) and PAIS Sea Turtle Coordinator (361/949-8173, ext. 226). A standard methodology for handling dead or stranded sea turtles found during the monitoring program will also be cooperatively established by the Sea Turtle Coordinator and the Service. This methodology shall be directed at determining the cause of death and ensuring that all data is recorded. The finder has the responsibility to ensure that evidence intrinsic to the specimen is not disturbed.

2. Submit a summary report from USACE to the Service's Corpus Christi Ecological Services Field Office annually. The USACE summary report should include measures implemented during project activities, success of such measures, incidences, and any recommendations on improvements to those measures. Reports should be sent to: U.S. Fish and Wildlife Service, Corpus Christi Ecological Services Field Office, ATTN: Field Supervisor, c/o TAMU-CC, 6300 Ocean Drive, Campus Box 338, Corpus Christi, Texas 78412.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal action agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or develop information.

For the benefit of sea turtles the Service recommends the following:

1. Work with the Service to design and fund a research program to determine the long-term effects of beach maintenance activities to beach erosion.

2. Work with the Service to design and fund a research program to determine the long-term effects of beach maintenance activities to sea turtle nesting success and/or piping plover critical habitat components.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in your request for formal consultation on the issuance of SWG-2007-01847. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take should cease pending reinitiation.

If you or your staff have any questions concerning this opinion, please contact Allan Strand or Mary Orms at (361) 994-9005 or via email at mary_orms@fws.gov.

Sincerely yours,

for Allan M. Strand
Field Supervisor

cc: Texas State Administrator, Service, Austin, TX
Regional Director, ATTN: Assistant Regional Director, Ecological Services,

MAY 1 3 2009

Albuquerque, NM
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Zonick, C. and M. Ryan. 1996. The ecology and conservation of piping plovers (*Charadrius melodus*) wintering along the Texas Gulf Coast. Department of Fisheries and Wildlife, University of Missouri, Columbia, Missouri 65211. 1995 Annual Report. 49 pp.

Zonick, C., K. Drake, K. Drake, L. Elliot, and J. Thompson. 1998. The Effects of dredged material on piping plovers (*Charadrius melodus*) and snowy plovers (*C. alexandrinus*) in the lower Laguna Madre of Texas. Final Report for the 1997/1998 season.

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APPENDIX A

Consultation History

November 30, 2007	Public Notice for Permit Application No. SWG-2007-1847 issued by USACE regarding the City of Port Aransas's application for a proposal of work.
January 5, 2009	The USACE submitted a draft BA for the City of Port Aransas project for review and comment.
February 9, 2009	Email from Sea Turtle Coordinator that stranded green sea turtles are being found in the seaweed on North Padre and Mustang Island each year. The juvenile green turtle population is increasing but so are the strandings of juvenile greens.
February 10, 2009	Meeting held at the Corpus Christi ES Office with the City of Port Aransas and USACE to discuss the draft BA and provide verbal comments. Clarification on various issues such as priority area and project area boundaries, retrofitting beach maintenance equipment tires, conferencing on proposed piping plover critical habitat were also discussed. It was agreed the USACE would revise the draft BA and submit the final with a letter requesting initiation.
February 13, 2009	The Service sent a letter to the USACE initiating formal consultation based on our meeting of February 10th and the biological and conference opinion was expected to be issued no later than May 20, 2009.
February 23, 2009	Director of the Animal Rehabilitation Keep (ARK) requested a meeting with the Service and PAIS representative to discuss turtle patrols for the City of Corpus Christi and the City of Port Aransas.
February 25, 2009	The USACE submitted a revised Final BA with a letter requesting a Conference Opinion on piping plover proposed critical habitat. Training was provided to beach maintenance staff for the cities of Corpus Christi and Port Aransas on piping plovers and sea turtles by PAIS and Service representatives. The Service, PAIS representative and ARK Director met to discuss turtle patrols that were scheduled and were to be performed by ARK for the northern end of the City of Corpus Christi's project area and the City of Port Aransas project area. Timing of patrols, volunteer requirements, pending MOA's and ATV responsibilities

were discussed. The ARK Director agreed to take all into consideration and determine if he could provide daily coverage from March 15-October 1, sunrise to 6:30 p.m.

The Service received a copy of an email from the ARK Director to the City of Corpus Christi informing them he would not be able to perform the turtle patrols for Corpus Christi or Port Aransas because he did not have the resources to provide patrollers to cover the necessary distances and timeframes.

February 27, 2009 — The Service called the Sea Turtle Coordinator at PAIS and discussed what type of training any new staff that would be performing turtle patrols for both cities since the ARK would not be able to perform the patrols as was previously thought when we completed the City of Corpus Christi BCO. The Coordinator stated the staff needed to attend a more intensive full day training, rather than the 2-3 hour training held on February 25th, to be certified as a turtle patroller.

March 3, 2009 — The Service informed the USACE that Port Aransas staff that would be performing turtle patrols would have to undergo a more extensive training than the one performed for maintenance workers on February 25th. The Service informed them of dates the Sea Turtle Coordinator at PAIS had scheduled training they could sign up to attend.

March 4, 2009 — The Sea Turtle Coordinator at PAIS sent an email with the dates of scheduled turtle patrol training. Dates were provided to the USACE to pass along to the City of Port Aransas and the City of Corpus Christi.

March 12, 2009 — The Service sent an email to the USACE asking whether they had spoken to Port Aransas in regards to the turtle patrols and reminding them of the training staff would have to undergo. The USACE responded that Port Aransas was going to do all the turtle patrols for their project area and were planning to send staff to the additional training.

The Service and the USACE discussed changing the time turtle patrols are to start each day because of Sea Turtle Coordinator's safety concerns beginning at 6:30 a.m. when it is still dark. The BA stated turtle patrols would occur between 6:30 a.m. to 6:30 p.m., therefore, the Service and USACE agreed to change the wording to state sunrise to 6:30 p.m.

March 13, 2009 — The Service and USACE agreed to clarify that prior to placing

	large piles of sand used for sculpture building during Sandfest, the area will be initially patrolled for sea turtles and their nests
March 18, 2009	The Service received data to map all nesting sea turtles and/or their nests that had occurred in the project area from 1995 to 2008.
March 19, 2009	The Service received an email from Mustang State Park stating the conditions that were included in the Corpus Christi BCO were not necessary for the Port Aransas BCO because of Port Aransas's distance from the park.
March 23, 2009	The Service sent an email to USACE requesting clarification of sheet 7 of 8 in the BA. The figure described the removal of decomposed sargassum from the maintenance storage area and placed in the surf zone below M.T.L. as part of the proposed action. However, it was not discussed in the description of the proposed action in the BA. The USACE conferred with the City and their consultants and confirmed the drawing was applicable and to include that action as part of the proposed action.
March 26, 2009	Draft BCO sent for internal review and comment.
April 6, 2009	Internal review comments received.
April 22, 2009	Draft BCO revised and forwarded to State Administrator for review and comment.
April 30, 2009	State Administrator comments received.
May 8, 2009	Draft BCO revised and forwarded to the USACE.

MAY 1 3 2009

ATTACHMENT 2

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008 (Rev. Feb. 2009)

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INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile (11.3 kilometers) area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles (11.3 kilometers) of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill,
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL,
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes,*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access,
E. Removal of decomposed sargassum from the beach maintenance storage area and placing it in the surf zone below MTL.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch (3-4.3 centimeters) blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.

When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment** - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities result in ruts greater than two inches deep, the City will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement if it is found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile (11.3 kilometers) stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (sunrise) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres (60,702 hectares) of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile (11.3 kilometers) stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 foot (61 meters) long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 foot (61 meters) long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 foot (61 meters) long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 foot (61 meters) survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 foot (61 meters) survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 foot (61 meters) survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 foot (61 meters) survey area beginning at marker 50 and heading south toward marker 51.

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 feet (15.24 meters) for a total of 200 foot (61 meters). Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and

November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 feet (15.24 meters) for a total of 200 feet (61 meters). Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous beach profile within the 200 foot (61 meters) survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 foot (61 meters) survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches (15.24-20.32 centimeters) thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches (10.16-15.24 centimeters) thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches (0-10.16 centimeters) thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 foot (61 meters) long survey area. The number of birds, species types, behavior, and location within the 200 foot (61 meters) survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

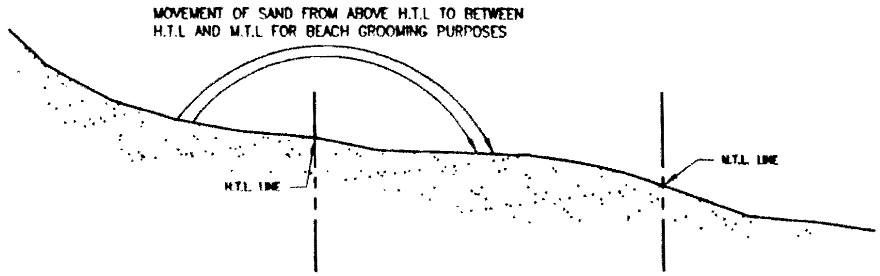
REPORTING RESULTS

The City's consultant will compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years. Additionally, if equipment tires are retrofitted tires so that they are inflated to no greater than 10 PSI in an attempt to reduce or eliminate rutting, the results will be monitored and reported.

MAY 1 3 2009

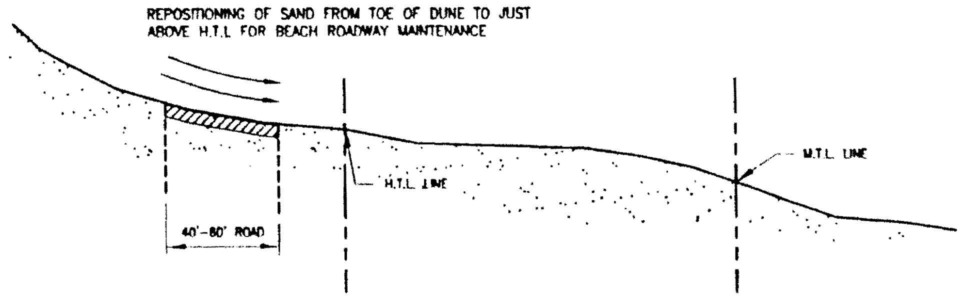
Figure 1. Project Area

PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S



2 | 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

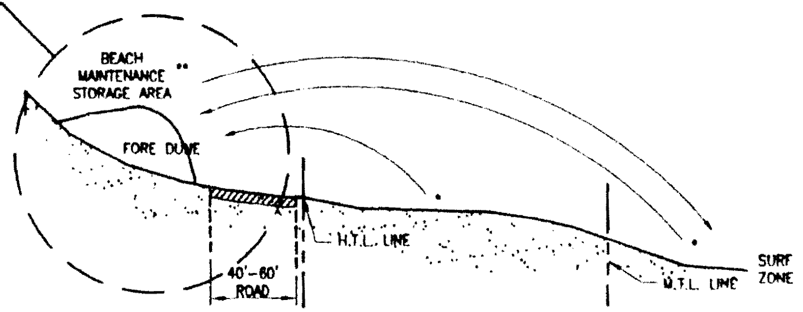
FOR COE USE ONLY Permit Application No.: SWG-2007-1847 Applicant Name: City of Port Aransas Sheet 6 of 8	APPLICANT: CITY OF PORT ARANSAS PROJECT NAME: GULF BEACH CLEANING COUNTY: NUECES		HDR | SHINER MOSELEY AND ASSOCIATES, INC. 555 N. Carancahua, Suite 1650 Corpus Christi, Texas 78478
	DATE: 06/07	REV. DATE: 8-14-2007	DATUM:
	PROJECT No: 66107	SHEET 06 of 08	

MAY 13 2009

Figure 2. Typical Section

PROPOSED BEACH MAINTENANCE PRACTICES

1 — 7 | 8 SEE DETAIL FOR ALTERNATE PLACEMENT AREAS ON SHEET 8 OF 8

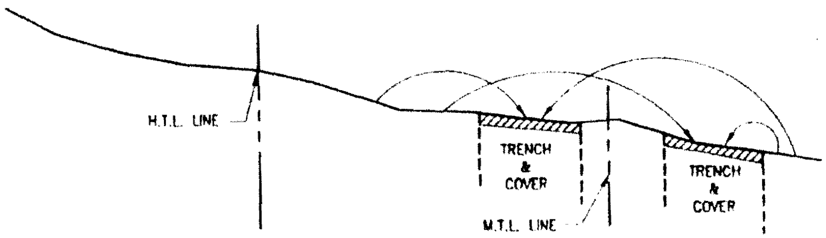


* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.

1 — 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

1 — 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

FOR COE USE ONLY	APPLICANT: CITY OF PORT ARANSAS	HDR SHINER MOSELEY AND ASSOCIATES, INC.
Permit Application No.: SWG-2007-1847	PROJECT NAME: GULF BEACH CLEANING	555 N. Carancahua, Suite 1650
Applicant Name: City of Port Aransas	COUNTY: NUECES	Corpus Christi, Texas 78478
Sheet 7 of 8	DATE: 06/07 — REV. DATE: 8-14-2007 — DATUM:	PROJECT No: 66107 — SHEET 07 of 08

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Figure 3. Typical Section

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Figure 4. Sea Turtle Nesting Sites within Project Area

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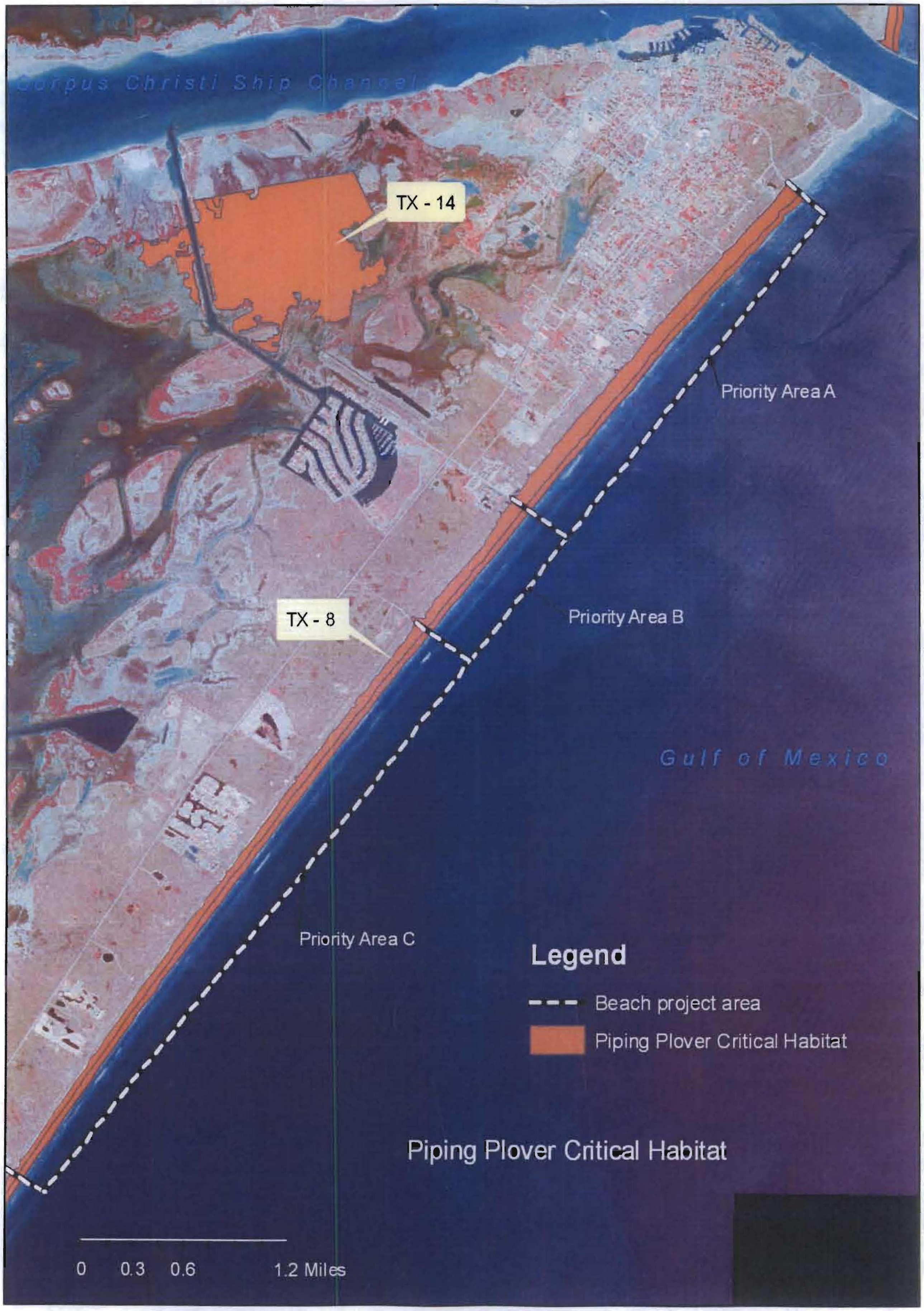

Figure 5. Piping Plover Critical Habitat

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
CORPUS CHRISTI REGULATORY FIELD OFFICE
5151 FLYNN PARKWAY, SUITE 306
CORPUS CHRISTI TX 78411-4318

May 19, 2009

REPLY TO
ATTENTION OF:

Regulatory Branch

SUBJECT: Consultation No. 21410-2008-I-0099; SWG-2007-01847

U.S. Fish & Wildlife Service
Attn: Mr. Alan Strand
Field Supervisor
Ecological Services
TAMU-CC Box 338
Corpus Christi, TX 78412

Dear Mr. Strand:

This letter is in reference to the draft Biological Conference Opinion (BCO), dated May 8, 2009, which we received on May 13, 2009 with respect to the City of Port Aransas (City) permit application SWG-2007-01847. A review of the BCO indicates that the Incidental Take Statement only addresses turtle nests and the hatchlings and/or eggs which could be taken. Our subsequent discussion revealed that "takes" attributed to vehicular strikes were inadvertently omitted. Accordingly, your office subsequently informed our office by electronic message, dated May 13 and 18, 2009, that the final BCO will include adult sea turtles that could be taken by vehicular strikes, including three Kemp's ridley, one loggerhead and one green sea turtle. It is our understanding that these specific incidental takes only apply to those activities directly related to this permit action, and would not apply to any actions not related to our permit, such as, but not limited to driving by the general public or city employees performing work not related to beach maintenance covered under this consultation.

We further note that the draft BCO contains a statement on page 5 that the City will take precautionary steps to avoid beach maintenance in the foredune area after 2:00 pm as a conservation measure for the piping plover. This provision was proposed in our December 5, 2008 Biological Assessment as a conservation measure for sea turtles; however, we now understand that this is an appropriate conservation measure for the piping plover and will not be specific to sea turtles.

Thank you for providing us the opportunity to review and comment on the BCO. Should you have any questions, please contact the Project Manager, John Wong, at the above letterhead address or by telephone at 361-814-5847.

Sincerely,

for Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office

Copy furnished:

Mr. Jeffrey Pollack
HDR/Shiner Moseley and Associates, Inc.
Corpus Christi, TX

MAY 2 2 2009

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
c/o TAMU-CC, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

May 19, 2009

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office
Department of the Army
Galveston District, Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411-4318

Consultation No. 21410-2008-F-0099

Dear Mr. Mullins:

This transmits the U.S. Fish and Wildlife Service's (Service) Final Biological and Conference Opinion (BCO) based on our review of the proposed issuance of U.S. Army Corps of Engineers (USACE) permit SWG-2007-01847 authorizing the City of Port Aransas (City) to perform beach maintenance activities along approximately 7 miles (11.3 kilometers) of beach beginning at the southern city limits and extending north to Lantana Drive and its effects on the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), threatened green sea turtle (*Chelonia mydas*), threatened loggerhead sea turtle (*Caretta caretta*), and proposed critical habitat for the threatened piping plover (*Charadrius melodus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. §1531 et seq.). This BCO is based on information provided in the *Final Biological Assessment (BA) of Potential Impacts to Threatened and Endangered Species, Department of the Army Permit Application SWG-2007-01847 by City of Port Aransas, U.S. Army Engineer District, Galveston, December 5, 2008.*

The USACE determined that the proposed project would have no effect on the endangered Gulf Coast jaguarundi (*Herpailurus yagouaroundi cacomitli*), endangered ocelot (*Leopardus pardalis*), endangered slender rush-pea (*Hoffmannseggia tenella*), South Texas ambrosia, (*Ambrosia cheiranthifolia*), endangered West Indian manatee (*Trichechus manatus*), and the endangered whooping crane (*Grus americana*) as these species are not known to occur in the project area. Also, based on current research and information, the Service concurred with USACE's determination of "may affect, but is not likely to adversely affect" for the endangered brown pelican (*Pelecanus occidentalis*), endangered Atlantic hawksbill sea turtle (*Eretmochelys imbricata*), endangered leatherback sea turtle (*Dermochelys coriacea*), and threatened piping plover. The USACE will condition any permit issued to the City for this work to include a provision that all employees must be provided information on the status and habitats of the brown pelican. We concurred with these determinations as detailed in a February 13, 2009 letter and these species will not be considered further in this Final BCO.

Critical habitat for the piping plover on its wintering grounds was designated July 10, 2001 (66 FR 36038) but the designation was challenged on March 20, 2006, by the Texas General Land Office (GLO). The court ordered the Service to vacate 19 of the 37 designated units in Texas and re-evaluate them for re-designation. On May 20, 2008 (73 FR 29294) the Service revised and proposed the designation of critical habitat for wintering piping plovers in Texas in 18 specific units, one of which (Unit TX-8) occurs within the proposed project area.

The USACE requested initiation of formal consultation on December 16, 2008, for the three sea turtle species and a formal conference for proposed wintering piping plover critical habitat units on February 10, 2009. A complete record of this consultation is on file in the Corpus Christi, Ecological Services Field Office in Corpus Christi, Texas.

Consultation History

A summary of the extensive consultation history is included as Appendix A.

BIOLOGICAL AND CONFERENCE OPINIONS

I. Description of the Proposed Action

Purpose of Project

The proposed action is the issuance of a Department of the Army (DA) permit SWG-2007-01847 to authorize beach maintenance activities pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Beach maintenance has been carried out by the City of Port Aransas since the 1970's. Future work, as proposed, will need a permit.

Action Area

The project area is defined as the area where the actual beach maintenance will take place, as depicted in the permit application drawings. It also includes the area to be affected directly and indirectly by the project. It is proposed for approximately 7 miles (11.3 kilometers) of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, Texas. The proposed beach maintenance does not include that beach segment from the South Port Aransas jetty to the Horace Caldwell Pier at Lantana Drive which is the responsibility of Nueces County (Figure 1).

Proposed Action

The proposed action consists of the City conducting beach maintenance. This work is to be done by: (a) removing all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing of them in a sanitary landfill, (b) relocating sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL, (c) trenching and burying sargassum or seaweed on the beach above the mean high tide (only during periods when there is an abundance of material in the dunes) (d) repositioning sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access and (e) once the sargassum decomposes, removing from the beach maintenance storage area and placing it in the surf zone below MTL. The permit will be issued for a five-year period, after which a request for an extension of time will be required to continue permitted activities (Figures 2, 3).

Beach maintenance practices will typically occur seasonally (April-August) but could be performed at other times of the year if conditions merit. Sargassum beach cleaning practices could be required as late as October when tropical storms or hurricane activities wash ashore large volumes of vegetative material. The frequency of roadway maintenance will be dictated by roadway use and environmental conditions and could occur year round. Most beach maintenance activities will take place between the hours of 7:00 a.m. and 3:30 p.m. The length of beach to be cleaned, the methods employed and the duration of maintenance activities in a given day will vary with beach conditions and staff availability.

The City's priority system for determining the order and areas to be cleaned is:

Priority Area A – High use areas including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, beginning at approximately 7:00 a.m., so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority Area A every day.

Priority Area B – Semi-heavily used areas including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas, from late-morning to mid-afternoon. Ground trash is handpicked from Priority Area B every day.

Priority Area C – Low use areas including those portions of the beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than Priority areas A and B. Ground trash is handpicked from Priority Area C every day (Figure 4).

Any additional work on the beach by the State of Texas, Nueces County, or the City of Port Aransas within the project area will not be covered under this permit action. These entities will be encouraged to seek their own permits and section 7 consultations for such operations.

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The type and size of equipment that may be used for beach cleaning are as follows:

Articulated Front-end Loaders – This machinery will typically be used to remove sargassum and a small amount of sand from between HTL and below MTL with subsequent placement of this material into Texas General Land Office (TGLO) beach maintenance storage areas located above HTL. This equipment will be utilized in Priority Areas A, B, and C. Articulated front-end loaders have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Motor Grader – A motor grader has a 10-14 inch (25.4-35.5 centimeters) blade that scrapes sargassum into a wind row located above and below the MTL. The blade can then be used to dig a trench and the sargassum wind row pushed into the trench and buried. The motor grader will also be used to level the beach from below MTL to HTL and to level the driving area. A motor grader will also be used in Priority Areas A, B, and C. Motor graders with rakes have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Dump Trucks – Dump trucks will typically be used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

Garbage Trucks – Garbage trucks will typically be used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's landfill. In addition, garbage trucks will be used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's landfill.

Pick-up Trucks – Pick-up trucks will typically be used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks may be used to remove large pieces of trash, such as lumber, and will typically be used in Priority Areas A, B, and C.

Tractor with Rake Attachment - This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL and will be used in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

Tractor with Surf Rake – This piece of equipment will typically be used to remove very small debris, seaweed, etc. from below MTL to above HTL and will be used in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which can prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

The City will typically have the following Public Works Staff assigned to beach maintenance: 1) four full-time heavy equipment operators, 2) two supervisors, and 3) six full-time ground custodians.

Conservation Measures
Conservation measures represent actions, pledged in the project description, correspondence and/or meetings, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. Since conservation measures are part of the proposed action, their implementation is required under the terms of the consultation. The USACE and the City have proposed the following conservation measures.

Piping Plover

Maintenance
Sargassum will be indiscriminately left in place as it is a primary constituent element for foraging piping plovers.

During beach maintenance activities equipment will be driven above the "wet line" on the beach to minimize disturbance of birds.

The City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m.

Education
The USACE will condition any permit issued to the City for this work to include a provision that all employees must be provided information as to the identification, status and habitat utilization of this species.

The City will arrange a yearly training course with a Service approved agency or facility (PAIS, University of Texas Marine Science Institute (UTMSI), Service). The scope of the training will include: (1) Identification of piping plovers; (2) Recognition of habitat; (3) Basic procedures for recording piping plover information; and (4) contact information for different rehabilitation agencies in the area.

The City will arrange for annual refresher training for existing beach maintenance staff, and provide new hires with piping plover training. This training will also be arranged with a Service approved agency or facility.

Monitoring
A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken to allow the City to conduct beach maintenance activities as authorized by the USACE permit and adaptively monitor the effects of beach maintenance activities on an as-needed basis (Attachment 2). Parameters to be assessed are: beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities.

Results of the habitat monitoring effort will be provided in an annual report to the USACE by February 1 of each year for a period of 5 years.

Sea Turtles

Maintenance

Beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. No maintenance equipment will enter a work area until an initial turtle survey has been performed and they are notified by the certified turtle patroller that it is clear to proceed.

If a turtle or turtle nest is located beach cleaning activities will immediately cease within 100 feet (30.48 meters) of the nest site and a City staff member will immediately report the sighting to the Sea Turtle Restoration Program. Beach cleaning activities will not recommence until a designee from the Sea Turtle Restoration Program has arrived on site and has given approval to do so. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City will have its staff flag the nest area and recommence work making sure that the nest site is avoided.

All ruts and berms created by city equipment engaged in beach maintenance activities will be smoothed out to no greater than 2 inches (5.08 centimeters) each day to enhance turtle tracks identification and to prevent small turtles from becoming entrapped. If ruts are to be smoothed with the use of a backhoe or tractor, a certified patroller will check for nesting turtles or tracks prior to smoothing the area.

If beach maintenance activities result in ruts greater than 2 inches (5.08 centimeters) deep, the City will explore the possibility of retrofitting equipment tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting or using multiple pieces of equipment in tandem to attain this target. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. A certified patroller will check for nesting turtle or tracks prior to smoothing the area.

Mechanical beach cleaning equipment shall not penetrate the surface of the beach more than 2 inches (5.08 centimeters). During beach maintenance activities equipment will be driven above the "wet line" on the beach to more easily identify sea turtle tracks.

If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredunes.

If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (61 meters) to allow turtles to traverse these areas, minimize the potential of turtle nest being covered by the sargassum and reduce fire ant infestation.

The City will be allowed to build an approximately 20-foot (6.1 meters) wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be present in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where the berms are in place, they will create an unrestricted pass for the turtle by smoothing out the berm with a shovel or tool. The proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest after an initial sweep of the site is done by a certified patroller. The piles of sand, and the sculptures made from the will be spaced so as to allow ample open beach for use by nesting turtles. The sculptures and mounds of sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

Education

The City will require all personnel involved in beach maintenance activities to receive training each year prior to their involvement in cleaning activities. The scope of the training will include: (1) identification of different turtle species; (2) recognition of turtle tracks or crawls; (3) basic procedures for recording turtle information if a turtle returns to the water prior to arrival of the turtle patrol team (4) protection of nest areas (5) contact information for different rescue agencies in the area.

In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will also be arranged with a Service approved agency or facility prior to turtle nesting season.

The City will require all turtle patrollers to receive an initial training and refresher course each year from a PAIS representative. This training will be an all day training and more intense than that required for the beach maintenance personnel.

The City will ensure that public education signs concerning turtles and their protection are posted at strategic locations within the project area.

Information to be included in the signs and placement locations will be coordinated with the Sea Turtle Coordinator at Padre Island National Seashore (PAIS). These signs shall contain information on both the importance of protecting sea turtles and on what to do and whom to call in the event a turtle siting occurs.

Monitoring

Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the

USACE for approval. This plan will detail how the City will ensure compliance with the conservation measures for sea turtles. An annual follow-up report will be presented to the USACE prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, the number of turtles taken, if any, listed by species, and a summary of. Measures implemented during project activities, relative success of those measures and any recommendations for improvement to the measures.

The City will provide a financial reward to any City beach maintenance employee who successfully identifies a turtle nesting site. All turtles, turtle nests, or turtle eggs found by monitors or maintenance personnel will be safe-guarded by City staff until they can be relocated by the appropriate authorities.

The City will ensure that daily turtle patrols are carried out during peak turtle nesting from March 15 to October 1 for the entire 7-mile (11.3 kilometers) stretch of beach within the project area, beginning at sunrise and ending at 6:30 p.m. The USACE will require the City to provide a trained certified turtle patroller or supervisor on-site to accompany equipment from March 15 to July 30.

In the event a take occurs, the City will immediately notify the USACE, Corpus Christi Regulatory Office (361) 814-5847 and the Service's Corpus Christi Field Office (361) 994-9005.

II. Status of the Species/Critical Habitat

Sea Turtles

The Service has jurisdiction for protecting sea turtles in inland waters and on the nesting beaches. The National Marine Fisheries Service (NMFS) has jurisdiction for protecting sea turtles in the marine environment. Five species of sea turtles are found in U.S. waters and nest on U.S. beaches: leatherback, hawksbill, loggerhead, green and Kemp's ridley. All are known to nest in Texas. The leatherbacks, hawksbills and Kemp's ridleys rarely nest in the southeastern U.S., but offshore waters are important feeding, resting, and migratory corridors. Only three sea turtles species (Kemp's ridley, loggerhead and green) that may be affected by the proposed project are discussed below.

Kemp's ridley sea turtle

Description

Kemp's ridley sea turtle was listed as endangered throughout its entire range on July 28, 1978 (43 FR 32800). Its range includes the Gulf coasts of Mexico and the U.S., and the Atlantic Coast of North America up to Nova Scotia and Newfoundland. It is known to occur in Alabama, Connecticut, Delaware, Florida, Georgia, Louisiana, Massachusetts, Maryland, Mississippi, North Carolina, New Jersey, New York, Rhode Island, South Carolina, Texas and Virginia and along Mexico's Atlantic Coast, as well as in tropical and temperate waters of the Atlantic Basin. Approximately 60 percent of Kemp's ridley turtles nest on the coastal beaches of North Padre Island. Approximately 99.9 percent of nests are found on coastal beaches of Tamaulipas and Veracruz where approximately 10,000 nests were protected in 2005, 12,000 nests were protected in 2006, and 15,000 nests in 2007 (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). A few Kemp's ridleys nest consistently at PAIS in Texas. Numbers have increased during recent years and are expected to continue to increase. Kemp's ridleys rarely nest at other locations in the U.S. outside of Texas (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Lately, females nesting on the Texas coast remain resident during the nesting season and after nesting season, some adults are transient here, but some remain resident. Two females traced prior to 2006 stayed here and one that was outfitted with a transmitter in 2007 also remained in Texas while a male that was tracked in Mexico traveled to waters off the Texas coast (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). The tracking studies conducted by Texas A&M University at Galveston are also showing residency of nesters in Texas waters during and to some extent after the nesting season (pers. comm. D. Shaver (NPS) to M. Orms (Service), Shaver et al 2005).

Kemp's ridley is the smallest of the sea turtles reaching about 2 feet (0.6 meters) in length and weighing up to 75-100 pounds (34-45 kilograms). The adult has an unusually broad, heart-shaped, keeled upper shell that is serrated behind the bridge, or midsection, almost as wide as it is long, and is usually olive-gray. The upper shell has five pairs of scales or plates along the sides. In the bridge hooking the lower shell to the upper shell, there are four infra-marginal plates, each perforated by a pore. The lower shell is a light, yellowish color. The head has two pairs of prefrontal scales. The Kemp's ridley has a triangular-shaped head with a somewhat hooked beak with large crushing surfaces. Juveniles have a dark-charcoal colored shell that changes to olive-green or gray with age. Preferred habitat for this species is shallow coastal and estuarine waters, primarily where crabs are found, but can occur in the bays on the middle and upper Texas coast with regularity.

Life history

Nesting occurs primarily around Rancho Nuevo, Tamaulipas, Mexico, from April to June although Kemp's ridley nests have been recorded as early as March and as late as August (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004). During preferred nesting conditions, precipitated by strong winds, the females come ashore mostly during the daytime, often in groups called "arribadas." Nests are dug on well-developed, elevated dunes in remote areas adjacent to large marsh complexes or shallow embankments. Although some females breed annually, this species is considered to nest biannually and may nest as many as three times a season (Service and NMFS 1992), with an average of 2.5 clutches per season. Clutch size averages between 100-110 eggs. Hatchlings emerge during the night and day after approximately 50 days of incubation. Sexual maturity is believed to be reached between 10 to 15 years of age. Some fidelity to nesting sites has been shown by Kemp's ridley, both within one nesting season, and between nesting seasons (pers. comm. D. Shaver (NPS) to R. Cobb (Service) 2003, Burchfield, et. al. 2002). If conditions are unsuitable on a nesting beach or the female is disturbed, she may return to the water and attempt to nest elsewhere within a short distance from the first site (within several kilometers to the north or south). It is also possible that the disturbance could cause them to switch nesting beaches entirely (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004).

Kemp's ridleys occur in the Gulf of Mexico and along the Atlantic coast of the U.S. with nesting locations concentrating on coastal areas of Rancho Nuevo, Mexico. Favorable habitat conditions include areas that shelter the turtle from high winds and waves with forage habitats including seagrass, oyster reefs, sandy bottoms, mud bottoms, and rock outcroppings with a diet consisting primarily of crabs, shrimp, snails, sea urchins, sea stars, fish and occasionally marine plants (TPWD 1995).

Since 1978, an international cooperative, experimental project involving the NPS, PAIS, Service, NMFS, Gladys Porter Zoo (Brownsville, TX), and Mexican Federal and State agencies has been ongoing. The project was designed to establish a secondary nesting colony of Kemp's ridley turtles in the U.S. at PAIS. Eggs were collected in Mexico from 1978 to 1988 and transported to PAIS for incubation. Hatchlings were released onto the beach, allowed to enter the water and then immediately recaptured and raised in "head start" facilities at Galveston, Texas, for approximately 9 to11 months, until they were mature enough to be released into the Gulf of Mexico. In 1986, NPS initiated a program to detect, monitor, and protect sea turtle nests at PAIS. Detection involves patrols to look for nesting activity, public education, and investigation of reports from patrols, beach workers, and the public. Patrols (NPS staff members and volunteers) use ATVs to search the park and adjacent northern county beaches for sea turtle tracks and nesting Kemp's ridley turtles each day, from April through mid–July. NPS protects the nesting turtles while they are on the beach and then NPS removes all sea turtle eggs that are located from the beach and transfers them to the incubation facility at PAIS. The last head-started hatchling experimentally imprinted to PAIS was released in 1988 (Service and NMFS 1992, pers. comm. D. Shaver (NPS) to M. Orms (Service) 2004). Hatchlings from the incubation facility are now released on the beach at PAIS and allowed to return to the Gulf of Mexico. Since 1996, some turtles experimentally imprinted to Padre Island, have returned to PAIS and the nearby vicinity to lay eggs (Shaver 1997, 1998a, 1999a, 1999b; Shaver and Caillouet 1998). Some other head-started Kemp's ridley have also nested at PAIS, but the majority of nests are turtles from the wild stock. From 1979 to 2008, 722 sea turtle nests were found on the Texas coast. Of the 722, 649 were Kemp's ridley nests, of which 361 were confirmed along the entire Gulf beachfront length of PAIS (Shaver 2008). For the 2008 nesting season, there have been a total of 195 confirmed nests. In addition to patrolling for all nesting turtles, NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Population dynamics

The Kemp's ridley sea turtle is an endangered sea turtle. Its numbers have precipitously declined since 1947, when more than 40,000 nesting females were estimated in a single *arribada* (Service and NMFS 1992). The nesting population produced a low of 702 nests in 1985 (Service and NMFS 1992). Since the mid-1980s, the number of nests laid in a season has been increasing, primarily due to nest protection efforts and implementation of regulations requiring the use of turtle excluder devices in commercial fishing trawls. During the 2005 and 2006 nesting seasons, more than 10,000 nests and 12,000 nests, respectively, and 15,000 in 2007 were present on nesting beaches in Mexico (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

Status and distribution

Reason for Listing:

For at least two decades, several factors have contributed to the decline of sea turtle populations along the Atlantic and Gulf coasts. Commercial over-utilization of eggs and turtle parts, incidental catches during commercial fishing operations, disturbance of nesting beaches by coastal housing, marine pollution, as well as entanglement and ingestion of debris threaten sea turtles (Service and NMFS 1992). The reproductive strategy of sea turtles involves producing large numbers of offspring to compensate for high natural mortality through the first several years of life. Additional threats are expanding human populations adjacent to important nesting beaches, degradation of coastal foraging habitats, and the potential effects of global warming on sex ratios (NMFS and Service 2007).

Range-wide trend

Historic nesting frequency on the south Texas coast is poorly known and only six Kemp's ridley turtles were documented prior to 1979 (Shaver and Caillouet 1998). Of the 722 sea turtle nests found on the Texas coast between 1979 and 2008, 649 were Kemp's ridley nests, 361 of which were found on PAIS (Shaver 2008). Today, through conservation efforts with Mexico and commercial fisheries, the population of Kemp's ridley appears to be in the early stages of recovery (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008, NMFS and Service 2007).

Critical Habitat

Critical habitat has not been designated for this species.

Loggerhead sea turtle

Description

The loggerhead sea turtle was listed as threatened throughout its entire range on July 28, 1978 (43 FR 32800). This species is widely distributed and can be found hundreds of miles offshore. It is known to occur in Alabama, American Samoa, California, Connecticut, Delaware, Florida, Georgia, Guam, Hawaii, Louisiana, Massachusetts, Maryland, Northern Mariana Islands, Mississippi, North Carolina, New Jersey, New York, Oregon, Puerto Rico, Rhode Island, South Carolina, Texas, Virginia, Virgin Islands, Palau, and other beaches along tropical and temperate seas.

It occurs in temperate and tropical waters of both hemispheres. This species inhabits the continental shelves and estuarine environments, bays, lagoons, salt marshes, ship channels and mouths of large rivers along the margins of the Atlantic, Pacific, and Indian oceans. The loggerhead sea turtle is characterized by a large head with blunt, powerful jaws. The upper shell and flippers are a reddish-brown color with a yellow lower shell. The upper shell has five pairs of costal scutes, or plates in the middle of the shell, with the first touching the plate just behind the head. Adults grow to an average weight of about 200 pounds (90.7 kilograms). Hatchlings lack the reddish tinge and vary from light to dark brown dorsally. Both pairs of flippers are dark brown above and have distinct white margins. The plastron and other ventral surfaces are dull, yellowish tan.

Life history

Loggerheads nest in the continental U.S. from Texas to Virginia, although the major nesting concentrations are found in Florida, Georgia, South and North Carolina. About 80 percent of loggerhead nesting in the continental southeastern U.S. occurs in six Atlantic coast Florida counties: Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward (NMFS and Service 1991b).

Loggerheads are predominantly nocturnal nesters. The continental U.S. nesting season extends from about May through August. Preferred nest sites are sloping beaches 1.5 to 2.5 feet (.76 meters) above waterline. They are known to nest from one to seven times within a nesting season (mean is about 4.1 nests per season) at intervals of approximately 14 days. Mean clutch size varies from about 100 to 125 eggs along the southeastern U.S. coast (NMFS and Service 1991b). Incubation ranges from about 45 to 95 days, depending on incubation temperatures, but averages 55 to 60 days for most clutches in Florida. Hatchlings generally emerge at night. Remigration intervals can vary from 1 to 7 years for nesting loggerheads, but 2 to 3 years is the most common. Age at sexual maturity is believed to be between 25 to 30 years.

Most loggerhead hatchlings originating from continental U.S. beaches are believed to lead a pelagic existence in the North Atlantic Gyre, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating at sea in association with sargassum rafts. Once they reach a certain size, juvenile loggerheads begin recruiting to coastal areas in the western Atlantic where they become benthic feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. Such juveniles occupy coastal feeding grounds for a decade or more in the neritic zone, not exceeding a depth of 656 feet (200 meters), before maturing and making their first reproductive migration; females will return to their natal beach to nest.

Predation of hatchlings and young turtles is assumed to be significant, and predation of subadult through adult stage turtles is assumed to be less common (NMFS and Service 1991b). Stancyk (1982) however, reported predators of juvenile and adult turtles to include at least six species of sharks, killer whales, sea bass and grouper. Tiger sharks appear to be the principal predator of subadult and adult turtles.

Although the loggerhead's diet includes a variety of marine invertebrates (sponge and jellyfish) and plants, it primarily feeds on mollusks (scallops, shellfish and queen conch), crustaceans (crab), and sargassum plants. Loggerheads may scavenge fish or fish parts or ingest fish incidentally in some circumstances (NMFS and Service 1991b).

The NPS program initiated in 1986 to detect, monitor, and protect Kemp's ridley nests at PAIS (see Kemp's ridley section) has expanded to include the other four species of sea turtles that occur along the Texas coast. Detection for all the species of sea turtles involves patrols to look for nesting activity, public education and investigation of reports from patrols, beach workers, in-park contractors, and the public. Patrols (NPS staff members and volunteers) use ATVs to search PAIS and the adjacent northern area of Kleberg County Beach for sea turtle tracks and nesting turtles. Each day, from April through mid-July, they repeatedly patrol the entire Gulf beachfront of PAIS during daylight hours. The patrol season and procedures are designed primarily to detect nesting by Kemp's ridley turtles, but the other sea turtle nests have also been documented as a part of the patrols and reports from the public. Daily runs to the Port Mansfield Channel and back are scheduled from mid-July through August to look for signs of nesting activity of loggerheads, greens, leatherbacks, and hawksbills, but these patrols are subject to funding and staff availability and thus are not conducted every year.

Population Dynamics

In the continental U.S., the population of loggerheads has declined, but most of that decline occurred prior to 1979. There has been no significant decline in recent years (Turtle Expert Working Group 1998; 2000). Loggerheads take approximately 25 to 30 years to mature so the effects of decline in immature loggerheads might not be apparent on nesting beaches for decades. Of the 722 sea turtle nests found on the Texas coast between 1979 and July 2008, 46 were loggerhead sea turtle nests, of which 36 were found on PAIS, and it is possible that a few were left undetected (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2007). Nesting surveys along Texas beaches that typically occur annually from April through mid-July to locate Kemp's ridleys would only locate loggerheads that nest during that time and would miss those that nest later. If nests are detected, all sea turtle eggs are excavated, transferred to the incubation facility at PAIS and then the hatchlings are released on the beach at PAIS and allowed to return to the Gulf of Mexico. In addition to patrolling for all nesting turtles NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Status and Distribution

Reason for Listing:

Threats to loggerhead populations include loss or degradation of nesting habitat from coastal development and beach armoring, beach nourishment, disorientation of hatchlings by beachfront lighting, excessive nest predation by native and non-native predators, degradation of foraging habitat, marine pollution and debris, watercraft strikes, disease, and incidental take from channel dredging and commercial trawling, longline, and gill net fisheries (NMFS and Service 1991b). There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

The fluctuating migratory patterns of the loggerhead make it a concern for numerous countries, some of which lack regulations regarding impacts towards the species. Conservation efforts to lessen threats include improvements to Turtle Excluder Devices (TED), regulations for incidental take among fisheries, and management of favorable coastal and marine habitat (NMFS and Service 1991b).

Range-wide Trend:

Hildebrand (1981) suggested that loggerhead nesting along the Texas coast has occurred within the last 300 years, but the earliest loggerhead nest that he was able to confirm for Texas was found in 1977. Total estimated loggerhead nesting in the southeastern U.S. is approximately 50,000 to 70,000 nests per year (NMFS and Service 1991b). From a global perspective, the southeastern U.S. nesting aggregation of loggerhead sea turtles is important to the survival of the species and is second in size to nesting in the Arabian Sea off Oman (Ehrhart 1989; NMFS and Service 1991b; Ross 1995). The status of the Oman colony has not been evaluated recently, but its vulnerable location for disruptive events such as catastrophic oil spills is a cause for considerable concern (Meylan, et al. 1995). The loggerhead nesting aggregations in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (NMFS and Service 1991b).

Critical Habitat
Critical habitat has not been designated for this species.

Green sea turtle

Description
The green sea turtle was listed as endangered in the breeding colony populations in Florida and on the Pacific coast of Mexico under the Act on July 28, 1978 (43 FR 32800). All other populations are listed as threatened. The green sea turtle has a worldwide distribution in tropical and subtropical waters. Major green sea turtle nesting colonies in the Atlantic occur in Florida, Mexico, Ascension Island, Aves Island, Costa Rica, and Surinam (NMFS and Service 1991a).

Adult green sea turtles can grow to a shell length of 4 feet (1.2 meters) and range from 250 to 450 pounds (113.3 to 204.1 kilograms). The adult's carapace is smooth, lacks a keel and is light to dark brown with dark mottling. Green sea turtles are long-distance migrants and are occasionally seen in open sea en route from feeding grounds to nesting beaches or vice versa. They occupy three habitat types: high-energy oceanic beaches, convergence zones in the pelagic habitat, and benthic feeding grounds in relatively shallow, protected waters. They are generally found in shallow waters (except when migrating) inside reefs, bays, estuaries, rock passes, and inlets, especially sea grass beds. Favored habitat appears to be lagoons and shoals with an abundance of sea grass and algae. Green sea turtles have been documented in large numbers at Packery, Mansfield, and Brazos Santiago passes. There have also been many observations at Fish Pass Jetties and the jetties for the Aransas Pass ship channel.

Life History
Open beaches with sloping platform and minimal disturbance are required for green sea turtle nesting. A variety of sands can be used for nesting, but must be loose and well drained. Female green sea turtles nest at night and deposit egg clutches on high-energy beaches, usually on islands, where a deep nest cavity can be dug above the high water line. One to seven clutches are deposited within a breeding season (the average number is usually two to three clutches) (NMFS and Service 1991a). Average clutch size is usually 110-115 eggs with incubation lasting 48-70 days. Hatchling emergence occurs at night. Nesting sites include locations in southern Florida and scattered locations in Mexico, although nesting occasionally occurs in south Texas. Adults reach sexual

maturity between 8 and 13 years of age and can have a life span of 30 - 50 years (TPWD 2007).

Hatchlings leave the beach and apparently move into convergence zones in the open ocean where they spend an undetermined length of time. When turtles reach a shell length of approximately 8-10 inches (20-25 centimeters), they leave the pelagic habitat and enter benthic-feeding grounds (NMFS and Service 1991a). Usually, these foraging habitats are pastures of sea grasses and/or algae, but small green sea turtles can also be found over coral reefs and rocky bottoms. Some feeding grounds only support certain size classes of green sea turtles; the turtles apparently move among these foraging areas as they grow. Coral reefs or rocky outcrops near feeding pastures are often used as resting areas, both at night and during the day.

Population Dynamics

Within the U.S., green sea turtles nest in small numbers in the U.S. Virgin Islands, Puerto Rico, and Texas, and in larger and growing numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (NMFS and Service 1991a). Growing numbers of nest have been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia counties) and from Pinellas County through Collier County (Service 2003b), but smaller numbers nest in Georgia, North Carolina and Texas. The first documentation of green sea turtle nests in South Carolina was reported in 1996 (Service 2003b). Unconfirmed nesting of green sea turtles in Alabama has also been reported (Service 2003b).

Scattered nesting occurs in the U.S. Pacific, the Commonwealth of the Northern Marianas, Guam, and American Samoa (NMFS and Service 1991a). In the western Pacific, the largest green sea turtle nesting aggregation in the world occurs on Raine Island, Australia, where thousands of females nest nightly in an average nesting season. In the Indian Ocean, major nesting beaches occur in Oman, where 6,000 to 20,000 females are reported to nest annually. Populations in Surinam and Costa Rica may be stable, but there is insufficient data for other areas to confirm a trend.

Status and Distribution

Reason for Listing:

Green sea turtles have been adversely affected by both direct harvest and degradation of nesting habitat. The eggs and succulent meat of this species have provided a dietary staple for humans in many regions, and epicures have relished green sea turtle soups and steaks for ages (Palmer and Braswell 1995). A green sea turtle fishery, operating almost exclusively within inshore waters (bays, estuaries, passes), began in Texas in the mid-1800's. By the early 1900's, the catch declined to such an extent that the turtle fishing and processing industry collapsed (Hildebrand 1981). Effects from channel dredging and commercial trawling, long line and gill net fisheries, the loss and degradation of nesting habitat from continued coastal development and beach stabilization, sediment disposal on beaches and beach grooming, disorientation of hatchlings by beachfront lighting, increased recreational activities on the beach (e.g., off-road vehicles), excessive nest predation by native and non-native predators, degradation of foraging habitat, marine pollution and debris, watercraft strikes, and disease have contributed to the decline of the green sea turtle population (NMFS and Service 1991a). Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green sea turtle populations in Florida, Hawaii, and other parts of the world (NMFS and Service 1991a). The tumors interfere with swimming, eating, breathing, vision and reproduction (NMFS and Service 1991a). Hypothermic stunning is another significant threat to green turtle survival in the U.S. (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

Range-wide Trend:
The primary nesting sites for green sea turtles in U.S. Atlantic waters are along the east coast of Florida, with additional sizeable sites in the U.S. Virgin Islands and Puerto Rico. Total population estimates for the green sea turtle are unavailable, and trends based on nesting data are particularly difficult to assess because of wide year-to-year fluctuations in numbers of nesting females, difficulties of conducting research on early life stages, and long generation time. Although historic nesting by green sea turtles on the Texas coast was suspected, the first confirmed nest was not documented until 1987 (Shaver 2000). Of the 722 sea turtle nests found on the Texas coast between 1979 and 2008, 26 were green sea turtle nests, 25 of which were found on PAIS and one on South Padre Island, although it is possible that a few were left undetected (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Sea turtles were not monitored for nesting activity at PAIS until 1986 and limitations in staff and funding reduced coverage during early patrol years and never enabled coverage during the entire green turtle nesting season. If nests are detected, all sea turtle eggs are excavated transferred to the incubation facility at PAIS and then the hatchlings are released on the beach at PAIS and allowed to return to the Gulf of Mexico. In addition to patrolling for all nesting turtles NPS also removes all stranded turtles for rehabilitation of live individuals or study in the event of mortality.

Critical Habitat
NMFS designated critical habitat for the green sea turtle on October 2, 1998. Critical habitat included waters extending seaward 3.5 miles (5.6 kilometers) from the mean high water line of Isla de Culebra (Culebra Island, Puerto Rico). Critical habitat has not been designated in Texas.

Piping plover

For the purpose of this BCO, discussions will be focused on the Texas wintering piping plover population and its designated and proposed to be designated critical habitat.

Description
The piping plover was federally listed as endangered in the Great Lakes watershed, and as threatened elsewhere in its range, on January 10, 1986. The piping plover is a small Nearctic (i.e., North American) shorebird approximately 7 inches (17.7 centimeters) long with a wingspread of about 15 inches (38.1 centimeters). Breeding birds have white underparts, light beige back and crown, white rump, and black upper tail with a white edge. In flight, each wing shows a single, white wing stripe with black highlights at the

wrist joints and along the trailing edges. Breeding plumage characteristics are a single black breastband, which is often incomplete, and a black bar across the forehead. The black breastband and brow bar are generally more pronounced in breeding males than females. The legs and bill are orange in summer, with a black tip on the bill.

Life History
Piping plovers breed only in North America within three geographic regions encompassing three distinct breeding populations: the Northern Great Plains, the Great Lakes, and the Atlantic Coast. The winter ranges of the different breeding populations overlap making it impossible to distinguish the source population of a wintering bird unless it has been banded or marked on the breeding grounds. The piping plover's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (Service 1985).

Southward migration to the wintering grounds along the southern Atlantic coast and Gulf of Mexico shoreline extends from late July, August, and September. Individuals can be found on their wintering grounds throughout the year, but sightings are rare in May, June, and early July (Service 2003a). In general, wintering piping plovers forage mostly on benthic invertebrates, insects, and crustaceans found within the intertidal areas of ocean beaches, washover areas with no or very sparse emergent vegetation, mudflats, sandflats, wrack lines; and shorelines of coastal ponds, lagoons or salt marshes. Roosting areas may be unvegetated or sparsely vegetated and may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers depend on a mosaic of sites distributed through the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change.

Population Dynamics
The coast of Texas is a major wintering area for piping plovers and may provide habitat for about 55 percent of birds found during winter censuses where birds spend up to 75 percent of their annual cycle (Nicholls and Baldassare 1990, Haig and Plissner 1993, Drake 1999). A consistent finding of all analyses of the demographic factors affecting the persistence and/or extinction of piping plover populations (Melvin and Gibbs 1994; Plissner and Haig 2000) is that vulnerability to extinction is greatly increased by even small declines in survival rates. Modeling by Melvin and Gibbs (1994), for example, postulated approximately four-fold increases in the likelihood of extinction of the Atlantic Coast piping plover population when survival rates of adults and juveniles declined by as little as 5 and 10 percent, respectively, and other parameters were held constant. Since piping plovers spend 55 to 80 percent of their annual cycle associated with wintering areas, factors that affect their well being on the wintering grounds could substantially affect their survival and recovery (Service 1996).

Status and Distribution
<u>Reason for Listing:</u>
The Atlantic Coast Piping Plover Recovery Plan (Service 1996) calls for the protection of all known wintering habitat by preventing habitat degradation and disturbance, including

direct and indirect impacts of shoreline stabilization, navigation projects, development, disturbance by recreationists and their pets, and contamination and degradation due to oil or chemical spills. In addition, the plan addresses the need to identify important migration stopover habitat and mitigate any factors that may adversely affect these areas. Factors that must be considered include: (1) disturbance depleting the birds' energy reserves, and (2) effects on prey availability that may last long after the completion of a given action.

Overall, winter habitat loss is difficult to document; however, a variety of human-caused disturbance factors have been noted that may affect plover survival or utilization of wintering habitat. Those factors include recreational activities, inlet and shoreline stabilization projects, dredging of inlets that can affect spit formation, beach maintenance and renourishment, and pollution. In some areas, natural erosion of barrier islands may also result in habitat loss.

Barrier beach habitats preferred by wintering piping plovers are dynamic, storm-maintained ecosystems (Service 1996). The construction of houses and commercial buildings on and adjacent to barrier beaches directly removes plover habitat and results in increased human disturbance. The impacts of shoreline development are often greatly expanded by the attendant concerns for protecting access roads. Legal restrictions on coastal development may slow the future pace of physical habitat destruction.

A decrease in suitability of the species' habitat due to accelerating recreational activity and development along the Atlantic Coast also threatens the plover. Habitat loss occurs when high human and/or animal use precludes the birds from successfully nesting. Habitat loss can also occur when man-made activities and operations (i.e., sand disposal, inlet dredging, etc.) cause birds to flee protective habitats and use valuable energy reserves.

Range-wide Trend

Human population growth along the U.S. coast creates an ever-increasing demand for beach recreation. In 1993, 32 percent of the U. S. Atlantic Coast population of piping plovers nested on federally-owned lands where some protection from development (Service 1996). The situation in the plover's Atlantic Coast wintering range is similar; 37 percent of the shoreline recently proposed for designation as critical habitat for wintering piping plovers in North Carolina, South Carolina, and Georgia is federally-owned, while 63 percent is in State and private ownership (65 FR 41782). Pressure from development and human disturbance on Atlantic Coast beach habitat continues, and the recovery plan emphasizes that piping plover habitat protection efforts must recognize and seek to perpetuate the natural dynamism of these barrier systems (Service 1996).

Critical Habitat

Critical habitat on the wintering grounds was designated July 10, 2001 (66 FR 36038). That designation included 137 areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas, to provide sufficient wintering habitat to support the piping plover at the population level and geographic distribution necessary for recovery of that species. A total of approximately 165,211 acres (66,881 hectares) and/or 1,798.3 (2,891.7 kilometers) were designated. There were 37 critical habitat units [approximately 62,454 acres (25,285 hectares), 797.3 miles (1,283.8 kilometers)] designated in Texas that were believed to contain the essential physical and biological elements for the conservation of wintering piping plovers and physical features necessary for maintaining the natural processes that provide appropriate foraging, roosting, and sheltering habitat components.

The primary constituent elements for wintering ground critical habitat are found in geologically dynamic coastal areas that contain intertidal sand beaches and sand and mud flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide. The primary constituent elements for the wintering population of the piping plover are: 1) Intertidal sand beaches including sand flats or mudflats between annual low tide and annual high tide with no or very sparse emergent vegetation for feeding. In some cases, these flats may be covered or partially covered by a mat of blue-green algae. 2) Unvegetated or sparsely vegetated sand, mud, or algal flats above annual high tide for roosting. Such sites may have debris or detritus and may have micro-topographic relief offering refuge from high winds and cold weather. 3) Surf-cast algae for feeding, 4) Sparsely vegetated back beach which is the beach area above mean high tide seaward of the dune line, or in cases where no dunes exist, seaward of a delineating feature such as a vegetation line, structure, or road. Back beach is used by plovers for roosting and refuge during storms. 5) Spits, especially sand, running into water for foraging and roosting. 6) Unvegetated washover areas with little or no topographic relief for feeding and roosting. Washover areas are formed and maintained by the action of hurricanes, storm surges, or the extreme wave actions. 7) Natural conditions of sparse vegetation and little or no topographic relief mimicked in artificial habitat types (e.g. dredge spoil sites).

On March 20, 2006, the Texas General Land Office (GLO) challenged the designation of 19 units of critical habitat along the Texas coast (Units 3, 4, 7, 8, 9, 10, 14, 15, 16, 17, 18, 19, 22, 23, 27, 28, 31, 32, and 33). On 26 July 2006, the United States District Court, Victoria County, Texas ruled the Service must vacate, re-evaluate and reconsider the designation of these units. On May 20, 2008 (73 FR 29294) the Service revised the designation of critical habitat for wintering piping plovers in Texas in 18 specific units. The 19 vacated units totaled approximately 231,280 acres (93,596 hectares). The proposed re-designation of the 18 units totaled approximately 138,881 acres (56,206 hectares) a difference of 92,399 acres (37,392.55 ha) less than originally designated in Texas. The total designated critical habitat for all 7 states (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana) in 2001 was 102,754 acres (41,595 hectares) combined with the proposed critical habitat in Texas in 2008 equals 241,635 acres (97,801 hectares).

All areas proposed as critical habitat in Texas are currently occupied and contain sufficient primary constituent elements to support at least one life history function. The public comment period closed on July 21, 2008. Final designation is in process and was delivered to the *Federal Register* on May 8, 2009.

Environmental Baseline

Under section 7(a)(2) of the Act, when considering the effects of an action on Federally-listed species, the Service is required to consider the environmental baseline which includes past and ongoing natural factors, impacts of all Federal, State, or private actions in the action area, including Federal projects in the action area that have already undergone section 7 consultation and the impacts of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

Status of the Species within the Action Area

The action area includes priority areas scheduled for beach maintenance with removal of sargassum (surf-cast algae) and roadway maintenance. The areas include the sandy Gulf beach and landward toward the dune line. Dunes may be densely to sparsely vegetated. Land ownership is State or private with most development behind the dunes. However, there are beach access roads that allow access to the action area, jetties, backbeach and washover areas.

Sea Turtles

Sea turtles sometimes inhabit the near shore Gulf of Mexico waters for foraging or migration and many are found stranded (washed ashore, alive or dead) (Shaver 1997, 1998a, 1998b, 1999a, 1999b; Shaver and Caillouet 1998). In Texas, nesting sea turtle season occurs from March 15 to October 1. Kemp's ridley turtles are historic nesters at PAIS (Hildebrand 1963, 1981, 1983; Shaver 1998a; Shaver and Caillouet 1998) with more Kemp's ridley nests consistently being found in PAIS than at any other location in the U.S. During 2006, 108 Kemp's ridley nests were documented in the United States, 5 in Florida, 1 in Alabama, and 102 on the Texas Coast. These nests were distributed along the entire Gulf of Mexico beachfront during the months of April, May, and June; the months that beach surveys were conducted most intensively.

In 2007, sea turtle stranding data for the Texas coast recorded 717 sea turtles, including 429 green turtles, 136 loggerheads, 125 Kemp's ridleys, 14 hawksbills, 1 leatherback and 12 unknown species. Over a 29-year period (1979 to 2008), 722 nests have been documented on the Texas coast.

From 1997-2008 a total of 15 Kemp's ridley nests and 1 loggerhead nest were documented within the action area. Nine nests were found along the beach and seven were located closer to the dunes. Ten nests were documented in beach maintenance Priority Area C, three in Priority Area B, and three in Priority Area A (Figure 4).

PAIS attempts to detect nests when they are laid, so that the eggs and resulting hatchlings can be protected. Beach visitors found one nest hatching outside the action area further south near Bob Hall Pier. They and others helped ensure safe passage of the hatchlings they observed, but they did not observe several of the hatchlings so it is unknown whether any of those were killed by predators or passing vehicles. Finding these and other undetected nests lends credibility to the assumption that some Kemp's nests are missed at egg laying despite intense patrolling and public education.

Piping Plover

The piping plover is a regular migrant and winter resident along the lower Texas coast (Haig and Oring 1985, Haig and Plissner 1993) and wintering birds have been reported along the length of the Texas coast. Piping plovers begin arriving on the wintering grounds in July, with some late-nesting birds arriving in September. A few individuals can be found on the wintering grounds throughout the year but sightings are rare in late May, June, and early July. They begin leaving in late February to migrate back to the breeding sites and by late May most birds have left (Haig and Elliott-Smith 2004). Individual wintering plovers tend to return to the same wintering sites year after year (Nicholls and Baldassarre 1990; Drake 1999).

International piping plover winter census was conducted and the results found 1,904 wintering piping plovers were counted in 1991, 1,333 in 1996 and 1,042 in 2001. During the 1996 International Piping Plover Survey (14-25 January 1996), a total of 265 birds were counted on Mustang Island from the south jetty at Aransas Pass to Padre Island (ABISW 1996). The proposed project area was included in that survey.

In summary, the piping plover may occur throughout the project area in varying numbers and concentrations depending on annual population fluctuations and depending on the time of year.

Piping Plover Proposed Critical Habitat

Critical Habitat for the piping plover wintering grounds (as opposed to breeding population Critical Habitat) has been designated in Texas by the Service (66 FR 36074—36078), some of which lies partially within the project area:

> Unit TX-8- Mustang Island Beach – This approximately 12.5 miles (20.1 kilometers), 620 ac (251 ha)gulfside unit is in Nueces County, extending northward from Fish Pass to the Horace Caldwell Pier on Holiday Beach within the City of Port Aransas. The landward boundary is the dune line where the habitat changes from lightly vegetated to densely vegetated and the gulfward boundary is MLLW (Figure 5).
>
> This unit is a gulfside beach unit. The habitat changes from lightly vegetated sandy beach to densely vegetated. The jetty, pier and bollards are not within the boundary of the unit. The unit is in State and private ownership with a small municipal park owned and managed by the City of Port Aransas. The State land is managed by the GLO. The unit was occupied by piping plovers at the time of listing and is currently occupied. Occupancy has been confirmed by species experts at least 2 years of the last 10. Habitat in this unit includes sand flats with

little or no emergent vegetation, surf-cast algae for feeding and unvegetated or sparsely vegetated sandy backbeach and washovers for roosting, sheltering and feeding. Due to the close proximity to the City, this unit receives considerable recreational use and beach cleaning and nourishment.

Factors Affecting Species Environment and Proposed Critical Habitat within the Action Area

A wide range of past, present and ongoing beach disturbance activities occur within the proposed action area. Nourishment activities can widen beaches, change sediments and stratigraphy, alter coastal processes, plug dune gaps, and remove overwash areas. Beach scraping, which has increased in frequency in recent years, can artificially steepen beaches, stabilize dune scarps, plug dune gaps, and change sediment distribution patterns. Artificial dune systems are constructed and maintained to protect beachfront structures. Excessive recreational use of beaches and flats may also pose a threat to the species utilizing these habitats by making them unsuitable or dangerous. Jetties to the north of the action area can be green and Kemp's ridley sea turtles congregation sites at certain times, which could increase potential boat strikes and other recreational hazards such as discarded debris, fishing line, and baited hooks that could impact the turtles.

Land ownership within the action area is both public and private. Development and recreational activities such as walking, jogging, walking pets unleashed and operating vehicles increases the potential for wintering piping plovers to be impacted by loss of habitat, or interference in the roosting, resting and foraging activities and sea turtles to be impacted by disruption of nesting habitat and activities. By following the City of Port Aransas's leash law, [Sec 16-116 (f)(1)] which requires pets to be under the control of an owner or person by means of a chain, rope, cord or leash of not more than ten (10) feet (3 meters) in length (section 4-26, Port Aransas Code) may help reduce some of the impacts from pets.

Predator species, that prey on sea turtle nests and possibly injured or sick plovers, include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), and skunks (*Mephitis mephitis). They* are common within the project area may increase as garbage increases.

All of these actions or factors may have adverse effects on sea turtles and wintering, non-breeding, piping plovers critical habitat by destroying, diminishing, or altering the habitats on which they depend.

Effects of the Action

Under section 7(a)(2) "effects of the action" refers to the direct and indirect effects of an action on a species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action. The effects of the proposed action are added to the environmental baseline to determine the future baseline that serves as the basis for the determination in this biological opinion. The impacts discussed below are the Service's evaluation of the direct and indirect effects of the proposed action. Indirect effects are those caused by the proposed action that occur later in time, but are still reasonably certain to occur (50 CFR 402.02). The Service has determined that there are no interrelated or interdependent actions apart from the action under consideration.

A. Factors to be considered

Sea Turtles and Piping Plover Proposed Critical Habitat

Proximity of the action: The proposed action occurs within the nesting range of the loggerhead, green, and Kemp's ridley sea turtles and the wintering range of the piping plovers. Additionally, the proposed action would occur within one proposed critical habitat unit for wintering piping plover.

Distribution: The expected disturbance from the proposed action is likely to occur on all ocean facing beaches throughout the action area which is habitat for both nesting sea turtles and proposed wintering piping plover critical habitat.

Timing: Sargassum or seaweed occurrence peaks in May and usually starts diminishing in July. In some years, during the winter months, there is no sargassum at all in January and February (Amos 2008). Beach maintenance activities will vary depending on the season and beach conditions. It is anticipated that from April through November a mixture of seaweed and sand will be removed from the beach and 25 foot (7.62 meters) roadway and either relocated to the foredune area and placed on the surface at 10-20 foot (3-6 meters) gaps every 200 feet (61 meters) or buried in a shallow trench just landward of the MLT. From November through April, only sand will be repositioned from immediately in front of the dunes in the above mentioned manner and distributed over the beach to make it drivable. The volume of the material repositioned during each maintenance activity may vary significantly. The volume for the April-November season will be 25 feet (7.6 meters) wide and excavation will not occur any deeper than 2 inches (5.08 centimeters) deep, nor will ruts and berms be over 2 inches (5.08 centimeters).

Typically, the City does not start removing sargassum from the beach until the deposits are 4-5 inches (10.2-12.7 centimeters) thick; however in high use areas (Priority Areas A and B) during heavy tourist seasons (March –September) the City can clean sargassum from the beach every day (i.e. there is no threshold level of sargassum required for beach cleaning). To protect piping plovers, the City will take precautionary steps to avoid beach maintenance work in the foredune area after 2:00 p.m. Equipment and other necessary maintenance vehicles will drive above the "wet line" on the beach.

The majority of direct and indirect effects of beach maintenance on sea turtles and their nests, eggs, and hatchlings are anticipated to occur primarily during the sea turtle nesting and hatching seasons from March 15 to October 1 and during summer and fall storm events until about November 30 when post-hatchlings may wash ashore. Direct impacts to live stranded turtles may occur year round. Although sea turtle nesting surveys will be performed continuously every day from sunrise to 6:30 p.m. from March 15 to October 1, nesting events may be overlooked. Overlooked nests will not be marked and are at risk.

Similarly, undetected sea turtle nests laid late in the summer result in hatchlings emerging in the fall after October 1.

The effects of beach maintenance on proposed critical habitat are anticipated to be year round during sargassum and/or seaweed removal and roadway clearing. The majority of effects will occur during heavy tourists seasons (March-September).

Nature of the effect: Beach maintenance activities that may affect sea turtles addressed in the BCO include collisions with equipment and/or maintenance vehicles, equipment and/or maintenance vehicles disturbing or harassing nesting sea turtles or hatchlings, tire ruts impeding hatchling sea turtle migration to the sea, sand compaction or excavation of sea turtle nest sites, lighting effects, beach erosion, removal of organic food source, escarpments, fire ant infestation of nests, egg damage due to vibration; and increased vehicular, human and pet disturbance by providing more access to more beach.

The Service considered the potential affects of the proposed action on the primary constituent elements of wintering piping plover habitat within the proposed critical habitat unit (TX-8), including the potential for beach maintenance activities to alter those habitat features.

Duration: The effects of the proposed action are likely to continue year round for 5 years until which time the permit will need to be renewed.

Disturbance frequency: The frequency of disturbance will be continuous throughout the sea turtle nesting and hatching from March 15 to October 1 in the action area. Although beach maintenance will likely decline during the winter months, the frequency of disturbance will be continuous throughout the action area for piping plovers proposed critical habitat.

Disturbance intensity: The potential for disturbance to the sea turtle populations throughout the action area is high because sargassum usually is at its peak during the peak sea turtle nesting season (April, May, June). Disturbance can also occur to the nests during the day by equipment, vehicles, pedestrians or their pets; especially if those nests go undetected. Increased predator activity following human use could also increase disturbance to sea turtle nests and hatchlings.

The potential modification of proposed piping plover critical habitat throughout the action area is high, but the intensity of the modification is expected to be greatest along the gulf beach in foraging and roosting habitat.

B. Analysis for effects of the action

Sea turtles

Beneficial effects:

Regular beach maintenance removes detritus such as human-produced garbage, barrels and old buoys as well as large natural objects such as tree trunks and sargassum which currently washes ashore in huge quantities along this shoreline. In fact, at times sargassum accumulates in windrows along the high tide line to such an extent that it creates a continuous barrier up to 4 feet (1.2 meters) in height and 10 to 20 feet (3-6 meters) in width. The removal of these objects, as well as smoothing of the beach from the toe of the dunes to the water's edge, can benefit the turtles' nesting attempts by removing a formidable physical barrier to and from nesting and hatching locations on the beach and by providing a smooth crawlway.

Direct Effects:

Collisions
Operation of maintenance-related vehicles on the beach can crush nesting turtles, stranded turtles, hatchlings, and eggs (Mann 1977; NMFS and Service 1991a, 1991b, 1992, 1993; Ernest et al. 1998). Adult loggerhead and green sea turtles nest at night and most female Kemp's ridleys nest during daylight hours and may be caught in the morning hours on the beach at some stage of nesting: oviposition, covering the nest, or exiting and returning to the ocean. Hatchlings may also emerge at night or early in the morning from any in-situ nests possibly missed by the daily sea turtle patrols. Post hatchlings are commonly stranded in sargassum washed in by late summer and fall storm events (these post-hatchlings are often referred to as washbacks). Post-hatchling washbacks are often found dead or in a weakened state; however, efforts are made to revive or maintain live post hatchlings for subsequent release when ocean conditions are calmer. Because of the size and high volume of traffic in some areas, live post hatchlings on the beach during the day are vulnerable to being run over or raked.

Vehicle collisions with sea turtle hatchlings during the daytime have been recorded. An incident occurred in 2006, where beach visitors found a sea turtle nest on North Padre Island in Priority Area 3, about .621 miles (1 kilometer) south of Bob Hall Pier. Visitors attempted to provide safe passage of the hatchlings to the water but some hatchlings were killed. It is unknown if the cause of mortality was predation or passing vehicles. Beach visitors also found another *in situ* nest hatching on Boca Chica Beach. Visitors attempted to provide safe passage but some hatchlings were killed by passing vehicles and then later eaten by gulls. Previous to the 2006 observations, three other nests found outside of PAIS had hatchlings that were crushed and killed by passing vehicles There was also a report of a stranded turtle being hit by a vehicle on South Padre Island (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2007).

Beach maintenance will only occur between sunrise and 6:30 p.m. Routine daily patrols by certified turtle patrollers are planned between March 15 and October 1 of each year. No maintenance will be performed at night, thus reducing the already minimal chance of injuring an adult sea turtle or hatchlings that may be emerging from an undetected nest.

Compaction or Excavation of Undetected Nests
Schroeder (1994) found that even under the best of conditions, experienced sea turtle nest

surveyors can misidentify about seven percent of the nests as false crawls. Also, weather, tides, and offroad recreational vehicle tracks can obscure sea turtle tracks especially after night nesting and before morning surveys, there is a potential to miss an additional number of nests.

Mann (1977) reported that driving directly above incubating egg clutches can cause sand compaction, which may decrease nest success and directly kill pre-emergent hatchlings and eggs potentially by physical crushing or collapse of the nest chamber. Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity. This can lead to increased false crawls and nests with shallow egg chambers (Fletemeyer 1996). Compaction could also make it more difficult for hatchlings to emerge from an undetected nest. Excavation of an undetected nest by beach cleaning equipment penetrating the surface deeper than 2 inches (5.08 centimeters) could reach the top layer of the nests. This could result in the scooping up of eggs and/or eggs being broken and yolks spreading throughout the nest, ruining the rest of the nest and mortality or injury to occurring to eggs and pre-emerging hatchlings.

Data are not available on the degree that compaction by vehicle use on the beach prevents or reduces nesting success. Many factors, including speed, weight, and size of the vehicle, the timing of the event with respect to the incubation period, the depth of the eggs/hatchlings (below grade) at the time of impact, and the physical characteristics of the nest itself, will influence whether or not, and the extent to which, mortality/injury occurs. Further, there is no established relationship between the cumulative number of times a particular nests has been run over and the extent and duration of the mortality/injury event. Also confounding this analysis are other factors that may affect the viability of any particular sea turtle nest. For example, tidal inundation, storm events, predation, and accretion/erosion of sand could negatively influence a sea turtle nest deposited in areas where beach driving will continue (NMFS and Service 1991a; 1991b; 1992; 1993). For these reasons, it is not possible to quantify the impacts beach maintenance could have on the undetected nests deposited annually in areas where beach cleaning activities are to occur.

Certified turtle patrollers locate nests primarily by searching for the tracks left in the sand and locating females during their nesting activity. However, nesting turtles do not always leave visible tracks on the beach, particularly in areas with very hard packed sand, very soft and blowing sand, and thick seaweed. The passage of City maintenance vehicles and equipment could also remove sea turtle tracks, making it difficult for the monitor to find a nest for investigation and protection. For example, the first female detected nesting at PAIS during 2003 barely left any trace of tracks on the hard-packed sand at the nest site located 0.5 miles (0.8 kilometers) south of the end of the paved road. Patrol staff that arrived while the turtle was nesting, noted that her tracks and nest would not have been located if visitors had not spotted her crawling on the beach (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008).

From 2002-2006, all 13 Kemp's ridley nests that were found after in-situ incubation were located very high on the beach or in the dunes. In contrast, the other Kemp's ridley nests found on the Texas coast during those years were documented along the entire beach width, from the high tide line to the dunes. It is possible other nests went undetected at lower beach positions, but did not survive to hatching because of vehicular beach driving, human disturbance, predation, or tidal flushing.

The probability of impacting the nests is potentially reduced because turtle monitors remove all sea turtle eggs from nests that are detected on the beach and transfer them to the incubation facility within PAIS. Hatching success is usually substantially elevated for eggs that are transferred to this facility rather than left undisturbed.

Tire Ruts and Berms

It is reported that vehicular ruts and berms create obstacles for hatchlings moving from the nest to the ocean. Upon encountering a vehicle rut, hatchlings may be disoriented along the vehicle track rather than crossing over it to reach the water. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon. Hatchlings are detoured along vehicle ruts and are at greater risk to vehicles, predators, fatigue and desiccation. If trapped for a period of time, this could cause them to weaken, invert, or succumb due to predation, disorientation, crushing, or dehydration (Hosier et al.1981; Fletemeyer 1996; Ernest et al. 1998). The depth and slope of the ruts influence the amount of impact, with deeper and more steeply sloped ruts causing a greater impact. Hosier et al. (1981) found that 3.9 to 5.9 inch (10 to 15 centimeter) deep tracks may serve as a significant impediment to loggerhead hatchlings. Berms created in roadways for emergency vehicles during special events may also create a barrier for adult nesting turtles and impact them by making them come ashore to nest and then abandon the nesting attempt (false crawl) or choose a less than suitable nesting area.

During 2002, Kemp's ridley hatchlings were found trapped in, and immediately adjacent to, ruts caused by beach grading. These hatchlings emerged from a nest on North Padre Island, north of PAIS, and 14 were killed when passing vehicles crushed them. In 2003, three Kemp's ridley turtles were documented nesting in the vehicular roadway at PAIS, including two nests dug within visible ruts. Others have nested in ruts during other years. Nesting in these ruts renders the nesters and eggs vulnerable to crushing during the subsequent passage of vehicles.

Despite the measures of nest protection and rut and berm removal to minimize impacts to hatchling sea turtles and even with turtle surveys from March 15 through October 1 there is a possibility of nest being undetected and impacts are anticipated.

Compaction of beach sediments

Sediments surrounding the egg chamber largely influence the incubation environment of the clutch. Temperature, moisture content, and gas exchange, all extremely important factors in the development of sea turtle embryos, are influenced by sediment characteristics (Ackerman et al. 1985). Thus, hatching success, emerging success, sex ratios, and hatchling fitness (size and vitality) may be different in compact sediments than in more loosely configured sediments of comparable grain size.

Beach driving, beach maintenance and equipment use likely contribute to sand compaction, but the additive effects of sand compaction due to vehicle traffic on nesting and reproductive success are not well understood. Operation of vehicles on the beach can cause direct impacts to the sand that can adversely affect sea turtle nesting and incubation habitat (Mann 1977; NMFS and Service 1991a, 1991b, 1992-1993; Ernest et al. 1998).

Vibration and Noise Impacts on Adults and/or Hatchlings

Vibrations and noise caused by moving City beach maintenance vehicles and/or equipment on the beach could frighten nesting turtles, causing them to false crawl (NMFS and Service 1991a, 1991b, 1992; Ernest et al. 1998). Vibrations could also harm incubating eggs, but are difficult to assess because scientific data are lacking to fully understand the level of impact on sea turtles from traffic vibrations or noise.

During 2006, 102 sea turtle nests were documented on the Texas coast with 64 of these occurring within PAIS. This record number of nests also took place with approximately 500,000 visitors coming to the park. Analyzing nesting data collected over the past 5 years for the action area, and given that most eggs are found and removed from the beach by PAIS staff and transported to an incubation facility, the potential impact of vibrations caused by City vehicles or equipment to eggs or to nests appears to be minimal.

Fire ant Infestation

Ground nesting birds and reptiles may be especially vulnerable to fire ant predation (Parris et al 2002). In 1997, observations at Cape San Blas, a coastal barrier island along the Northern Gulf of Mexico recorded 14 of 54 loggerhead nests infested with fire ants and hatchling mortality at two of the 54 nests. Upon excavation one of the two nests, fire ants were observed consuming sea turtle hatchlings that cracked (pipped) the egg shell. In the second nest, fire ants were observed consuming an undetermined number of pipped eggs and skeletonizing five hatchlings before emergence from the nests (Parris et al 2002). In 1998, one observer recorded a hatchling being consumed by fire ants near the nest surface. Injuries included blinding due to removal of eyes and wounds to head and flippers from necrotizing fire ant stings. The increased incidents of fire ant induced mortality of loggerhead sea turtle hatchlings may directly affect the survival of the young. In Texas, a sea turtle nest was found near the foredune where sargassum and sand had been dumped during beach cleaning activities that had been infested with fire ants. The nest was fortunately found before any injuries or mortality occurred (pers. comm. D. Shaver to M. Orms 2008). Measures to potentially reduce this occurrence during beach maintenance activities includes spacing the placement of the sand and sargassum in 10-20 foot (3-6 meters) gaps every 200 feet (61 meters) to allow the turtle to traverse the area for nesting opportunities and to reduce the amount of sargassum that may attract fire ants.

Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur.

Lighting
Those species of sea turtles that nest primarily at night (green, loggerhead) are likely to be the most affected by night driving and associated lighting. Vehicle lights can also cause direct and indirect impacts on nesting turtles leading to false crawls. Lights can also disorient hatchlings so that they crawl in the wrong direction rather than enter the sea. This can make hatchlings more vulnerable to crushing, predation, and dehydration (NMFS and Service 1991a, 1991b; Fletemeyer 1996). However, beach maintenance vehicles will not be used at night, nor will artificial lighting be used for beach maintenance activities. It is also unlikely that Kemp's ridley turtles will be significantly affected by artificial lights since they are primarily daytime nesters.

Modification of Habitat
Driving on the beach is an established tradition in Texas and to maintain useable road surface, blading and scraping is used. In some parts of the U.S. this action is used to protect dunes and structures, but in Texas it provides continued driving access to the beach. Kana and Svetlichny (1992), state that scraping of "surplus" sand and placing it at the toe of the dunes helps protect them but should only be used as a temporary measure.

Beach maintenance activities can also remove significant quantities of sand and alter grain size. Because seaweed helps prevent the loss of finer sediments to the wind, groomed beaches tend to have a slightly coarser texture (Stauffer 2008). Beach maintenance activities such as raking and blading can modify sea turtle habitat by compacting the sand, unstablizing the dunes, creating ruts, berms and escarpments and also providing additional access to the beach and vehicular movement along the beach. Each impact can potentially resulting in the death or injury of nesting sea turtles, nests, and hatchlings. However, as stated above, it is impossible to determine long term effects in short studies due to the many factors that may be involved (location, winds, currents, tidal influx, sand grains, amount of sargassum, etc.).

Sea Turtles Response to Proposed Action

Sea turtles are relatively sensitive to changes in the nesting environment. The ratio of false crawls to nests increases in beach areas with higher vehicle use than in areas with limited or no vehicle access. The ratio of nests to false crawls on undisturbed beaches is about 1:1 (Dodd 1988). Sea turtle eggs are also sensitive to the nesting environment. The sex of an embryonic sea turtle is determined by the temperature of the nest environment. Vehicle use on the beach may change the nest environment by altering sand compaction and gas diffusion, which may in turn affect temperature.

Due to the PAIS' Sea Turtle Program, nesting has increased along the Texas and Mexico coast and is expected to continue to rise. However, that rise in numbers could be compromised with increased impacts from beach maintenance activities, development, nourishment projects and recreational use. It is possible that nesting numbers, and subsequently the number of hatchlings produced, could decline, and then the population may suffer (pers. comm. D. Shaver to M. Orms 2008).

Sea turtles reach sexual maturity at different ages depending on the species. Leatherback and Kemp's ridley turtles can reach sexual maturity as early as 10-15 years of age. However, loggerhead and green sea turtles do not reach sexual maturity until 20 to 50 years of age. If there is a reduction in the number of nests laid along the Texas coast, and subsequently the number of hatchlings produced, then it may take decades before those hatchlings are contributing reproductively to the population. Conservation efforts on Mexican beaches began in the mid-1960's and the population continued to decline to the low point in nests in 1985 (i.e. about 20 years). Currently there is about a 14 percent per year increase in nesting in Mexico because of ongoing conservation measures. The increase in the number of nests per year is slightly larger in Texas. However, in Texas we have more variables (changes in patrol coverage and public education to get reports) and this complicates calculating a recovery rate accurately here. Therefore, the general recovery rate of sea turtles is slow, but the specific recovery rate in the action area is unknown.

Piping Plover Proposed Critical Habitat Analysis

In this BCO, the key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the wintering piping plover and would retain the current ability for the physical and biological features to be functionally established. Activities that may destroy or adversely modify critical habitat are those that alter the physical and biological features to an extent that appreciably reduces the conservation value of all proposed and designated critical habitat for the winter piping plover.

Primary Constituent Elements

The primary constitute elements (PCEs) determined essential for conservation of wintering piping plovers are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. The PCEs for wintering ground critical habitat are found in geologically dynamic coastal areas that contain intertidal sand beaches and sand and mud flats (between annual low tide and annual high tide), associated dune systems, and flats above annual high tide.

The PCEs in Unit TX-8 consist of sand flats with little or no emergent vegetation, surf-cast algae (sargassum or seaweed) for feeding, and unvegetated or sparsely vegetated sandy backbeach and washovers for roosting and sheltering and for feeding. Sand or mud flats adjacent to unvegetated or sparsely vegetated sand, mud or algal flats above the high tide are important for roosting piping plovers. These sites have debris, detritis (decaying organic matter), or microtopographic relief (less than 19.7 inches (50 centimeters) above substrate surface) offering the plovers refuge from high winds and cold weather. Sparsely vegetated backbeach (beach area above mean high tide seaward of the dune line or seaward of a delineating feature such as a vegetation line, structure or road) is also used for roosting and refuge from storm events. Surf-cast algae is important for feeding on prey. Washover areas, broad, unvegetated zones with little or no topographic relief and are formed and maintained by hurricanes, storm surges and other extreme wave actions are used for both feeding and roosting.

Proposed Critical Habitat Units and Priority Areas
A portion of proposed, occupied, critical habitat unit TX-8 is within the action area and will be disturbed by beach maintenance activities. TX-8 totals approximately 620 acres (251 hectares) or 12.5 miles (20.1 kilometers). However, only a total of approximately 256 acres (103.5 hectares) or 7 miles (11.3 kilometers) out of a total of 241,635 acres (97,801 hectares) of designated and proposed critical habitat distributed over 8 states is within the action area and includes Priority areas A, B, and C

Factors Affecting Undesignated, Designated and Proposed Critical Habitat

Removal of organic matter and food source
Beach wrack accumulates at the top of the intertidal zone. "Wrack" is the buildup of debris that consists of seagrass/weed or sargassum, marine organisms and other material deposited on the beach with the tides and waves (Noriega and Schlacher 2007). The wrack provides food and habitat for shorebirds and invertebrates (McKenna 2006). Mechanical cleaning provides a beach free of trash and natural debris can disrupt the natural ecological process and modify the function of the structure of the beach ecosystem and remove an important component of the food chain (Noriega and Schlacher 2007).

Withers studied beach raking effects on invertebrate fauna on PAIS in1997 (Englehard and Withers 1997). She only looked at beach raking because that is the only type of cleaning PAIS allows on the closed beach. She looked at shrimp near the surfline and sandhoppers in the wrack lines, polychete worms and a variety of insects. Sargassum and detritus were a major food source for the invertebrates. She found that sand hoppers were affected in the wrackline but not differently from the control after 10 days. Haustoriid amphipods were unaffected but nearshore insects, *Orchestia* amphipods and polychetes took longer to recover their numbers after raking. Raking of sargassum probably decreased food for shorebirds in the short term but recovered by day 14. She also found that June and July are when the human visitation was the highest at PAIS and the shorebird populations are down, so they would probably not be affected by decrease of food. Plover migration is greatest before and after sargassum influx (May, June, July), although early in the migration when sargassum is still in place and during late months prior to migration, raking may limit the food source available in the proposed critical habitat unit.

Beach maintenance activities may temporarily displace plovers causing them to move to other suitable nearby locations where these activities are not occurring. Although debris removal in the high beach area may eliminate some material that plovers use for protection from the wind and the elements, this activity will only occur sporadically during the winter months when the birds are present and in most need of protection from the elements.

Beach Erosion

The Texas Bureau of Economic Geology (BEG) determines shoreline erosion. Trends may change as the shoreline is in constant flux due to the dynamics of sediment supply, long-term relative sea level rise, and episodic storm events. The BEG compares the elevation information from a mapping technique called Light Detection and Ranging (LIDAR) surveys with historical shorelines to calculate annual rates of shoreline change. When the long-term (1800's and 1930's to 1980's and 2000) shorelines were compared, the Gulf beaches of Mustang Island and North Padre Island showed they were experiencing net erosion (McKenna 2006). Beach maintenance activities and removal of sargassum narrows beaches from the foredune, changes the grade of the foredune, weakens dunes by covering the vegetation matting, decreases the beach elevation and alters the beach profile (Conti 2008). Backstacking material and placing the material between the dune ridges may strengthen and heighten the dunes (Watson 2008).

A study on the west and east end of Galveston Island analyzed elevation changes of a one year period on raked and unraked beaches. Results indicated that there is not a statistically significant difference in elevation changes between the raked and unraked beaches over a one year time (Williams et al 2007). It also indicated that birds and other terrestrial species on the beach are more dependent on the fresh influxes of sargassum than the older deposits of sargassum on the high tide line; therefore beach raking may not cause detrimental environment impacts to avian and other fauna on the beach. However, it also stated that longer studies for a longer period of time may be able to show some effects on elevation and whether birds use the sargassum wrack for nesting, camouflage, or social aggregation. Avian studies should extend the time period into morning, afternoon, and night observations. Other factors that may result in other conclusions may be that the sand movement may be from a different location depending on the location of the project (Williams et al 2007).

Inlet Dredging and Dredge Spoil

Inlet dredging and artificial structures, such as breakwalls and groins, can eliminate wintering areas and alter sedimentation patterns leading to the loss of nearby habitat (Service 2003a). Deposition of dredge spoil, a practice occasionally considered beneficial to piping plovers and used to mitigate effects of habitat destruction, may actually be detrimental depending on placement. In Texas, piping plovers avoid islands of dredged material in favor of natural habitats (Zonick et al. 1998). In the Laguna Madre, these artificial islands impede water flow between tidal flats and the lagoon, resulting in vegetation encroachment that lowers the quality of important foraging habitat for piping plovers (Zonick et al. 1998).

Vehicular Traffic and Recreational Use

In Texas beach driving is allowed in many areas of the wintering grounds from the mean low tide line to the line of vegetation on the shore. Zonick and Ryan (1996) found that in Texas, human disturbance continues to decrease the amount to undisturbed habitat and appears to limit local piping plover abundance. Beach maintenance to remove sargassum and improve roadways may allow for the increased human disturbance on proposed critical habitat. Increased vehicular access may result in increased ruts, berms, and trash that could increase the expected timing and frequency of maintenance activities that could expose critical habitat to further erosion and removal of organic matter and food sources. However, without properly monitoring vehicular use within the action area for a sustained period of time with and without beach maintenance it would be difficult to determine if beach maintenance actually increases human and vehicular use.

Proposed Critical Habitat Response to Proposed Action

Adult survival is key to the continued and long term existence of the piping plover and to stepwise improvement toward meeting its recovery criteria. Protecting the wintering grounds allows adult piping plovers to maintain adequate body so they survive the winter and can migrate back to nest in the spring. Broad management actions on the wintering grounds include protection of resting areas, designation of important shorebird wintering sites and regular shorebird surveys. TX-8 unit continues to support PCEs essential for the conservation of the species with the current levels of human use and existing management. Continued beach maintenance within this unit may reduce the suitability of the habitat for wintering piping plover. The total of approximately 256 acres (103.5 hectares) or 7 miles (11.3 kilometers) being disturbed within the proposed action area represents about .10 percent of the total designated and proposed critical habitat units [241,635 acres (97,801 hectares)]. Considering the effects of beach maintenance activities being authorized by the issuance of SWG-2007-01847 on the one proposed unit, together with the effects on the other 134 previously designated or proposed units the overall effect on proposed and designated wintering piping plover critical habitat is expected to be minimal.

Cumulative Impacts

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this BCO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative impacts to nesting sea turtles would result primarily from vehicle access along the Gulf beach from the public and possible commercial operations. The greatest potential for a direct, adverse impact would occur from non-City related vehicle traffic crushing a nesting turtle or an undocumented nest or emerging hatchlings, or causing hatchling mortality due to vehicle rutting. The risk of impacting night-nesting, rarely occurring loggerhead and green sea turtles is minimized because of the limited possibility of encountering one on the seashore, although the risk may be slightly higher for the Kemp's ridley because of their increased numbers. As night driving by the City is restricted during the sea turtle nesting season, the chance of injuring an adult is remote, especially for the loggerhead and green sea turtles. The risk to emerging sea turtle hatchlings and undetected nests laid during the night will be reduced by the initial surveys performed by certified turtle patrollers in the morning prior to any City equipment entering the site to be cleaned.

Additional development or other activities occurring within the action area may occur without Federal authorization. Continued development may increase the number of visitors to the area (increasing vehicles, pedestrians, pets, and predators) which will have associated effects to Federally-listed species within the action area. Such actions include increased lighting from development that may affect the sea turtle nesting habitat of the beachfront, or increased predators associated with people.

IV. Conclusion

Sea Turtles

Avoidance and minimization measures such as the PAIS Egg Relocation Program, beach patrols, certified turtle monitors, reducing vehicular beach cleaning activity, establishing protocols for notification, scheduling maintenance work, improving beach conditions, does not remove all potential impacts but do reduce the likelihood of sea turtle impacts occurring. Therefore, after reviewing the current status of the Kemp's ridley, loggerhead and green, sea turtles, the environmental baseline for the action area, 7 miles (11.3 kilometers) of ocean front beach within the priority action areas, the effects of the proposed City beach cleaning activities permitted by the USACE and the cumulative effects, it is the Service's biological opinion that the permitting of SWG-2007-01847, as proposed is not likely to jeopardize the continued existence of the listed Kemp's ridley, loggerhead and green nesting sea turtle species under the Service's jurisdiction. There is no critical habitat listed in the state of Texas for these species of sea turtles, therefore none will be affected.

Proposed Piping Plover Critical Habitat

The proposed TX-8, is occupied and totals 620 acres (251 hectares) or 12.5 miles (20.1 kilometers. Approximately 256 acres (103.5) and 7 miles (11.3 kilometers) of the proposed critical habitat unit will be disturbed by beach maintenance activities, representing approximately .001 percent of the total 241,635 acres (97,801 hectares) of designated and proposed critical habitat distributed over 8 states are within the action area. Therefore, after reviewing the current status of the wintering piping plover, the environmental baseline for the action area, the effects of the proposed issuance of SWG-2007-01847 and the cumulative effects, it is the Service's conference opinion that the proposed action is not likely to significantly destroy or adversely modify proposed critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the USACE so that they become binding conditions of any grant or permit or project agreement issued to the City as appropriate, in order for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered by this incidental take statement. If the USACE (1) fails to assume and implement the terms and conditions or (2) fails to require the City to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the USACE must report the progress of the action and its impacts on the species to the Service as specified in the incidental take statement (50 CFR 402.14(i)(3)).

Amount or Extent of Take Anticipated

Sea Turtles
Based on the review of biological information and other information relevant to this action, incidental take is possible in the form of harassment, injury, and/or death from:

1. Beach maintenance vehicles and/or equipment driving over an adult sea turtle, hatchling, stranded or post-hatchling washback sea turtles and/or eggs from an undetected, unmarked/unprotected sea turtle nest,

2. Beach maintenance vehicles or equipment causing the loss of a nest or individual eggs by compaction, excavation, or vibration,

3. Hatchling sea turtles emerging from undetected, unmarked/unprotected nests and subsequently caught in vehicle ruts created by beach cleaning activities in areas where no rut removal has taken place,

4. Disorientation of adults and/or hatchlings by mobile or stationary lights, or

5. Behavior modification or physiological stress during the adult turtle's attempt to nest and potentially increasing the number of false crawls during the nesting season or situations where they choose marginal or unsuitable nesting areas to deposit eggs.

The Service anticipates that incidental take of hatchlings and eggs will be difficult to detect for the following reasons: (1)(a) turtle nests are difficult to find, especially for greens and loggerheads, which are primarily nocturnal nesters, (b) natural factors, such as rainfall, wind, and tides may obscure crawls, and (c) human-caused factors, such as pedestrian traffic, may obscure crawls, resulting in nests being destroyed because they were missed during the nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beaches and be forced to nest in less optimal areas; and (5) lights may disorient an unknown number of hatchlings and cause death. However, the level of take of sea turtle adults, nests, hatchlings and eggs can be anticipated because: (1) 16 sea turtle nests were documented within the action area from 1997 to 2008; (2) recent data documented 13 undetected Kemp's ridley nests outside the project area.

As stated previously, between 1979 and 2008, a 29-year period, 722 nests have been recorded along the Texas coast with 16 sea turtles occurring within the action area (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). Beach maintenance activities will occur more intensely in Priority Areas A and B. There were 3 nests found in Priority Area A and 3 in Priority Area B. Priority Area C had the highest number of sea turtle nests, 10, over a 12 year period, however it is the area that will receive the least beach maintenance (pers. comm. D. Shaver (NPS) to M. Orms (Service) 2008). The Service anticipates the proposed project could potentially "take" a maximum of 16 nesting sea turtles prior to any avoidance and minimization measures being implemented. Implementation of avoidance and minimization measures by the USACE and the City further reduces the estimated number of sea turtles that could be taken. If these measures are to be deviated from, the USACE and the city must contact the Service. The Kemp's ridley is the most frequently documented sea turtle occurring in the action area and the loggerhead is a very infrequent second. Thus, the potential for beach maintenance activities interacting with Kemp's ridley adults, hatchlings or nests would be greater, thus the number of Kemp's ridley adults, hatchlings and nests at risk of "take" would also be greater.

Therefore, the Service anticipates that, despite avoidance and minimization measures implemented throughout the life of the project during beach cleaning, a risk still exists, although minimal, that adult sea turtles could be struck by vehicles and nests could go undetected by the egg relocation program surveys within the proposed action area and:

1) 3 adult Kemp's ridley sea turtle and 3 nests per year, including all hatchlings and/or eggs (approximately 100 to 110 eggs per nest) could be taken.
2) 1 adult loggerhead sea turtle and 1 nest per year, including all hatchlings and/or eggs (approximately 100 to 125 eggs) could be taken.
3) 1 adult green sea turtle and 1 nest per year, including all hatchlings and/or eggs (approximately 110 to 115 eggs) could be taken.

If the agreed upon avoidance and minimization measures are deviated from or if the level of take is reached for any one of the species, we request that the USACE contact the Service immediately to review the circumstances and revisit the take analysis. Although incidental take is anticipated for three Kemp's ridley nests per year, if one nest is taken the Service also would appreciate the opportunity to review the circumstances and the avoidance and minimization measures.

Effect of Take

In the accompanying BCO, the Service determined that this level of anticipated take is not likely to result in jeopardy to sea turtles, or destruction or adverse modification of designated or proposed piping plover critical habitat.

REASONABLE AND PRUDENT MEASURES

As detailed in the project description, the USACE and the City have agreed on voluntary measures to avoid and minimize impacts to sea turtles and piping plovers. The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impact of incidental take on sea turtle species and assist the Service in improving methods to minimize impacts of incidental take on these listed species.

1. Establish a protocol to notify the Service immediately of direct take of a sea turtle, excavated eggs, or an undetected nest.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the USACE must comply with the following terms and conditions, which implement the reasonable and prudent measure, described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. In the event that activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the Service's Corpus Christi Ecological Services Office (361/994-9005) and PAIS Sea Turtle Coordinator (361/949-8173, ext. 226). A standard methodology for handling dead or stranded sea turtles found during the monitoring program will also be cooperatively established by the Sea Turtle Coordinator and the Service. This methodology shall be directed at determining the cause of death and ensuring that all data is recorded. The finder has the responsibility to ensure that evidence intrinsic to the specimen is not disturbed.

2. Submit a summary report from USACE to the Service's Corpus Christi Ecological Services Field Office annually. The USACE summary report should include measures implemented during project activities, success of such measures, incidences, and any recommendations on improvements to those measures. Reports should be sent to: U.S. Fish and Wildlife Service, Corpus Christi Ecological Services Field Office, ATTN: Field Supervisor, c/o TAMU-CC, 6300 Ocean Drive, Campus Box 338, Corpus Christi, Texas 78412.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal action agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or develop information.

For the benefit of sea turtles the Service recommends the following:

1. Work with the Service to design and fund a research program to determine the long-term effects of beach maintenance activities to beach erosion.

2. Work with the Service to design and fund a research program to determine the long-term effects of beach maintenance activities to sea turtle nesting success and/or piping plover critical habitat components.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in your request for formal consultation on the issuance of SWG-2007-01847. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take should cease pending reinitiation.

If you or your staff has any questions concerning this opinion, please contact Allan Strand or Mary Orms at (361) 994-9005 or via email at mary_orms@fws.gov.

Sincerely yours,

E. Dawn Whitehead

for Allan M. Strand
Field Supervisor

cc: Texas State Administrator, Service, Austin, TX
Regional Director, ATTN: Assistant Regional Director, Ecological Services,

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Albuquerque, NM
Anne Hecht, USFWS, Piping Plover Coordinator, Region 5
Sandy MacPherson, USFWS, Sea Turtle Coordinator, Region 4
John Wong, COE, 5151 Flynn Parkway #306, Corpus Christi, TX 78411-4318
Gary Young, Law Enforcement, San Antonio, TX

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APPENDIX A

Consultation History

November 30, 2007	Public Notice for Permit Application No. SWG-2007-1847 issued by USACE regarding the City of Port Aransas's application for a proposal of work.
January 5, 2009	The USACE submitted a draft BA for the City of Port Aransas project for review and comment.
February 9, 2009	Email from Sea Turtle Coordinator that stranded green sea turtles are being found in the seaweed on North Padre and Mustang Island each year. The juvenile green turtle population is increasing but so are the strandings of juvenile greens.
February 10, 2009	Meeting held at the Corpus Christi ES Office with the City of Port Aransas and USACE to discuss the draft BA and provide verbal comments. Clarification on various issues such as priority area and project area boundaries, retrofitting beach maintenance equipment tires, conferencing on proposed piping plover critical habitat were also discussed. It was agreed the USACE would revise the draft BA and submit the final with a letter requesting initiation.
February 13, 2009	The Service sent a letter to the USACE initiating formal consultation based on our meeting of February 10th and the biological and conference opinion was expected to be issued no later than May 20, 2009.
February 23, 2009	Director of the Animal Rehabilitation Keep (ARK) requested a meeting with the Service and PAIS representative to discuss turtle patrols for the City of Corpus Christi and the City of Port Aransas.
February 25, 2009	The USACE submitted a revised Final BA with a letter requesting a Conference Opinion on piping plover proposed critical habitat. Training was provided to beach maintenance staff for the cities of Corpus Christi and Port Aransas on piping plovers and sea turtles by PAIS and Service representatives. The Service, PAIS representative and ARK Director met to discuss turtle patrols that were scheduled and were to be performed by ARK for the northern end of the City of Corpus Christi's project area and the City of Port Aransas project area. Timing of patrols, volunteer requirements, pending MOA's and ATV responsibilities

were discussed. The ARK Director agreed to take all into consideration and determine if he could provide daily coverage from March 15-October 1, sunrise to 6:30 p.m.

The Service received a copy of an email from the ARK Director to the City of Corpus Christi informing them he would not be able to perform the turtle patrols for Corpus Christi or Port Aransas because he did not have the resources to provide patrollers to cover the necessary distances and timeframes.

February 27, 2009 — The Service called the Sea Turtle Coordinator at PAIS and discussed what type of training any new staff that would be performing turtle patrols for both cities since the ARK would not be able to perform the patrols as was previously thought when we completed the City of Corpus Christi BCO. The Coordinator stated the staff needed to attend a more intensive full day training, rather than the 2-3 hour training held on February 25th, to be certified as a turtle patroller.

March 3, 2009 — The Service informed the USACE that Port Aransas staff that would be performing turtle patrols would have to undergo a more extensive training than the one performed for maintenance workers on February 25th. The Service informed them of dates the Sea Turtle Coordinator at PAIS had scheduled training they could sign up to attend.

March 4, 2009 — The Sea Turtle Coordinator at PAIS sent an email with the dates of scheduled turtle patrol training. Dates were provided to the USACE to pass along to the City of Port Aransas and the City of Corpus Christi.

March 12, 2009 — The Service sent an email to the USACE asking whether they had spoken to Port Aransas in regards to the turtle patrols and reminding them of the training staff would have to undergo. The USACE responded that Port Aransas was going to do all the turtle patrols for their project area and were planning to send staff to the additional training.

The Service and the USACE discussed changing the time turtle patrols are to start each day because of Sea Turtle Coordinator's safety concerns beginning at 6:30 a.m. when it is still dark. The BA stated turtle patrols would occur between 6:30 a.m. to 6:30 p.m., therefore, the Service and USACE agreed to change the wording to state sunrise to 6:30 p.m.

March 13, 2009 — The Service and USACE agreed to clarify that prior to placing

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	large piles of sand used for sculpture building during Sandfest, the area will be initially patrolled for sea turtles and their nests
March 18, 2009	The Service received data to map all nesting sea turtles and/or their nests that had occurred in the project area from 1995 to 2008.
March 19, 2009	The Service received an email from Mustang State Park stating the conditions that were included in the Corpus Christi BCO were not necessary for the Port Aransas BCO because of Port Aransas's distance from the park.
March 23, 2009	The Service sent an email to USACE requesting clarification of sheet 7 of 8 in the BA. The figure described the removal of decomposed sargassum from the maintenance storage area and placed in the surf zone below M.T.L. as part of the proposed action. However, it was not discussed in the description of the proposed action in the BA. The USACE conferred with the City and their consultants and confirmed the drawing was applicable and to include that action as part of the proposed action.
March 26, 2009	Draft BCO sent for internal review and comment.
April 6, 2009	Internal review comments received.
April 22, 2009	Draft BCO revised and forwarded to State Administrator for review and comment.
April 30, 2009	State Administrator comments received.
May 8, 2009	Draft BCO revised and forwarded to the USACE.
May 19, 2009	USACE provided comments on the Draft BCO. Final BCO sent to USACE.

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ATTACHMENT 2

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008 (Rev. Feb. 2009)

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INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile (11.3 kilometers) area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles (11.3 kilometers) of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill,
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL,
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes,*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access,
E. Removal of decomposed sargassum from the beach maintenance storage area and placing it in the surf zone below MTL.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch (3-4.3 centimeters) blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C.

When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet (3-6 meters) apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches (5.08 centimeters) into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities result in ruts greater than two inches deep, the City will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement if it is found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile (11.3 kilometers) stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A** - High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (sunrise) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B** - Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C** - Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres (60,702 hectares) of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile (11.3 kilometers) stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 foot (61 meters) long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 foot (61 meters) long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 foot (61 meters) long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 foot (61 meters) survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 foot (61 meters) survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 foot (61 meters) survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 foot (61 meters) survey area beginning at marker 50 and heading south toward marker 51.

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 feet (15.24 meters) for a total of 200 foot (61 meters). Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and

November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 feet (15.24 meters) for a total of 200 feet (61 meters). Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous beach profile within the 200 foot (61 meters) survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 foot (61 meters) survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches (15.24-20.32 centimeters) thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches (10.16-15.24 centimeters) thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches (0-10.16 centimeters) thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 foot (61 meters) long survey area. The number of birds, species types, behavior, and location within the 200 foot (61 meters) survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

REPORTING RESULTS

The City's consultant will compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years. Additionally, if equipment tires are retrofitted tires so that they are inflated to no greater than 10 PSI in an attempt to reduce or eliminate rutting, the results will be monitored and reported.

MAY 2 2 2009

Figure 1. Project Area

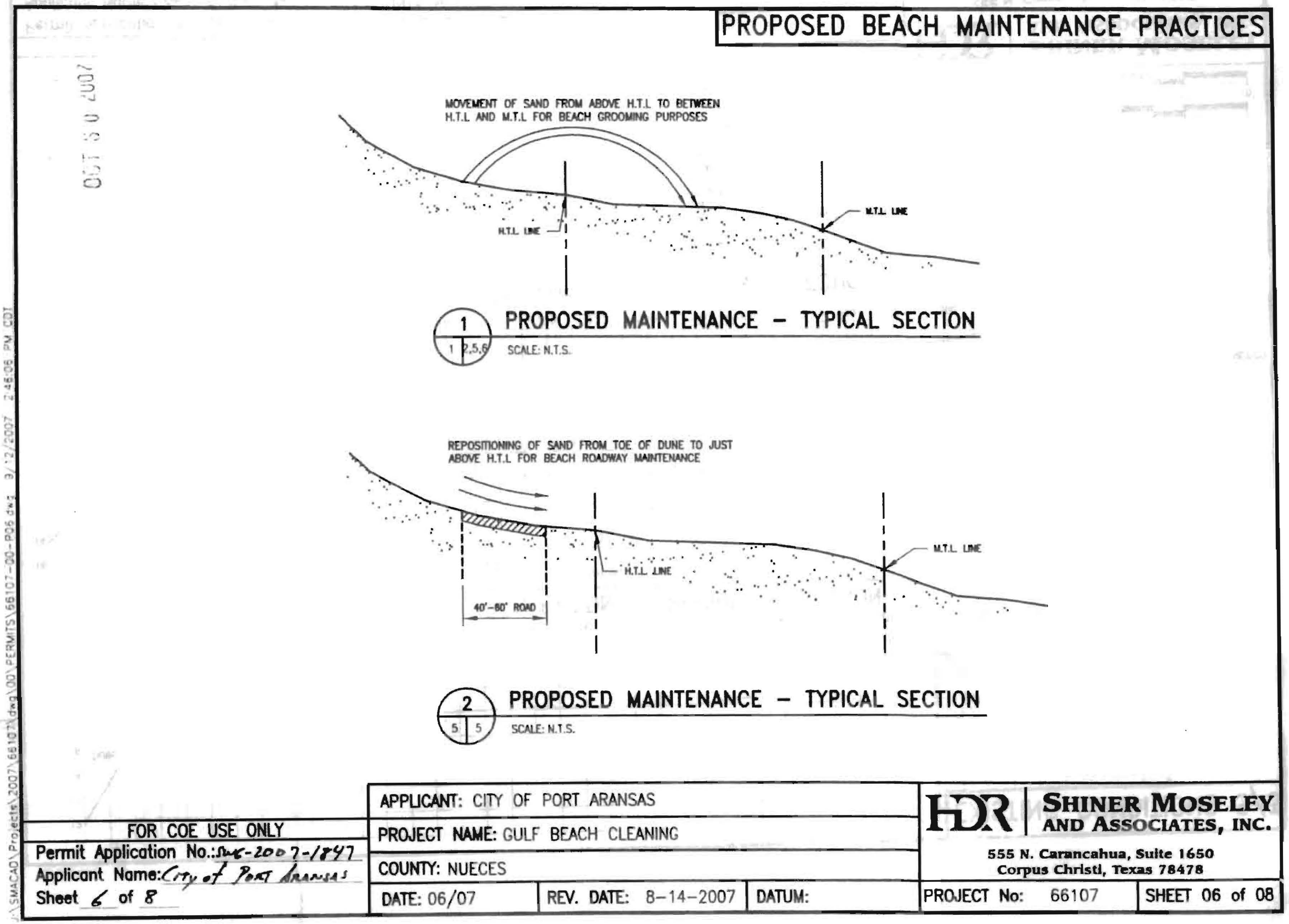

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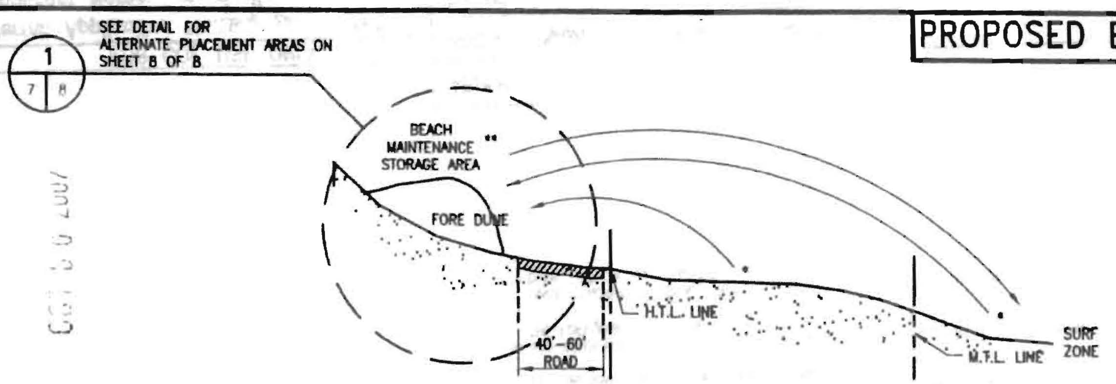
Figure 2. Typical Section

PROPOSED BEACH MAINTENANCE PRACTICES



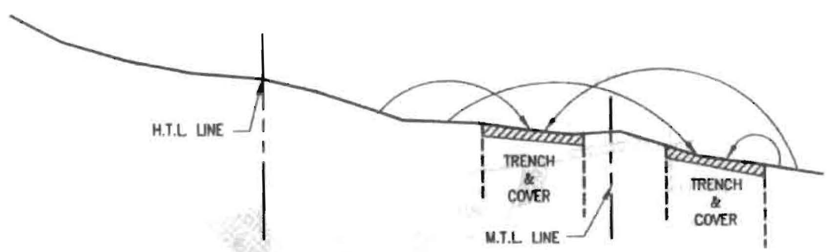
1 | 1 | 2,5,6

PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

1 | 5 | 5

PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

FOR COE USE ONLY Permit Application No.: SWG-2007-1847 Applicant Name: City of Port Aransas Sheet 7 of 8	APPLICANT: CITY OF PORT ARANSAS			HDR SHINER MOSELEY AND ASSOCIATES, INC. 555 N. Carancahua, Suite 1650 Corpus Christi, Texas 78478
	PROJECT NAME: GULF BEACH CLEANING			
	COUNTY: NUECES			
	DATE: 06/07	REV. DATE: 8-14-2007	DATUM:	PROJECT No: 66107 — SHEET 07 of 08

Figure 3. Typical Section

MAY 22 2009

Figure 4. Sea Turtle Nesting Sites within Project Area

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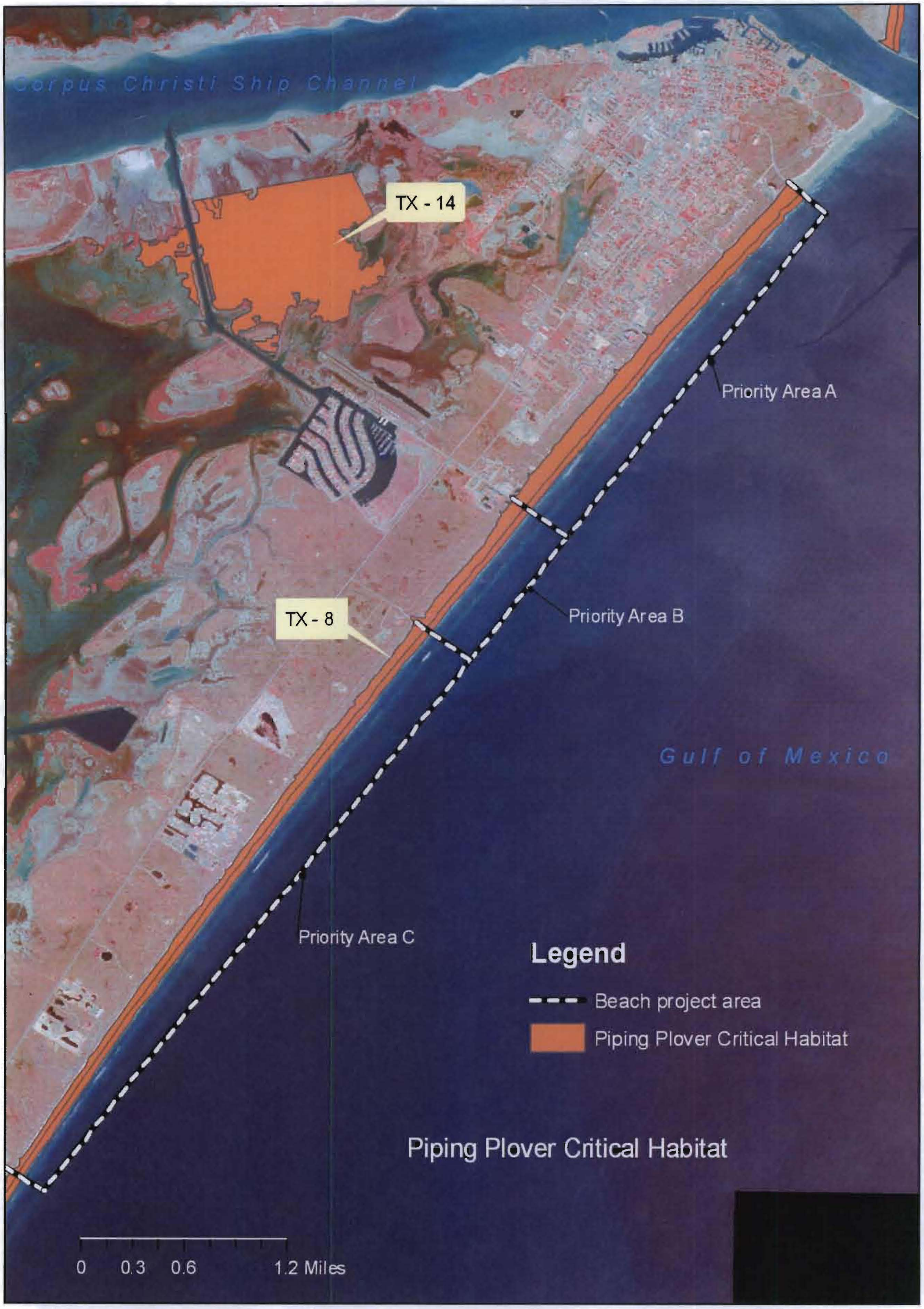

Figure 5. Piping Plover Critical Habitat

The International Journal of Nautical Archaeology and Underwater Exploration (1987) **16.2**: 149–157

Investigation of a Civil War anti-torpedo raft on Mustang Island, Texas

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Introduction

During the American Civil War (1861–1865), the Confederates developed a number of underwater explosive devices called torpedoes, later known as mines. Designed to protect harbour approaches, some of these devices were remarkably sophisticated, several designs employing electrical detonators. The effectiveness of these mines gave rise to the construction of anti-torpedo rafts by the Union Navy which, it was hoped, would clear paths through mined harbours, allowing Union naval forces to penetrate Confederate defences. The strategy called for a raft constructed of multiple layers of heavy timbers, held together by iron bolts, designed with a re-entering angle such that it could be fitted to the bow of a ship which would push it through the mine fields, detonating the explosives, leaving the ironclad unharmed.

In December of 1862, the Secretary of the Navy directed Rear Admiral F. H. Gregory to arrange for the transportation of four such rafts from New York to Port Royal, S.C. Acting Volunteer Lt. E. H. Faucon was the commander of the chartered steamer *Ericsson* dispatched to tow the rafts, and on 30 January 1863, the four rafts were taken under tow. The next day, one of the rafts was discovered missing, and consequently, Lt. Faucon elected to anchor off Ft. Monroe, Virginia, on 4 February to rerig the lashings of the remaining three rafts. After refastening the rafts with chains, Lt. Faucon proceeded towards Port Royal on 10 February. On the 12 February, in heavy seas, two of the remaining rafts broke loose and were lost some 40 miles south-southwest of Cape Hatteras.

A single torpedo raft was delivered to Rear Admiral S. F. DuPont of the S. Atlantic Blockading Squadron at Port Royal on 17 February. After an investigation, Lt. Faucon was not held responsible for the loss of the rafts (Gardner, 1965).

The torpedo raft first saw action on 7 April 1863, in an attack on Charleston Harbour (Fig. 1). The ironclad *Weehawken*, pushing an anti-torpedo raft, led eight ships against the harbour defences. The *Weehawken* was a *Passaic*-class ironclad, an improved and enlarged version of the *Monitor*. After crossing the Charleston Bar, the raft proved too difficult to manage. It was apparently a case of the 'tail wagging the dog': the heavy raft pitched and collided with the bow of the ironclad to the extent that Captain John Rogers of the *Weehawken* ordered the raft to be cut adrift.

The Confederates later found the raft, which they called the 'Devil' on Morris Island, and described it as 'a massive structure, consisting of two layers of white pine timbers, 18 in (0·45 m) square, strongly bolted together... 50 ft long, (15·24 m) 27 ft (8·23 m) wide... heavy iron plates... and chains with grappling irons' (Gardner, 1965).

A contemporary newspaper account from the Charleston Courier suggests that the anti-torpedo raft was thought to have been attached

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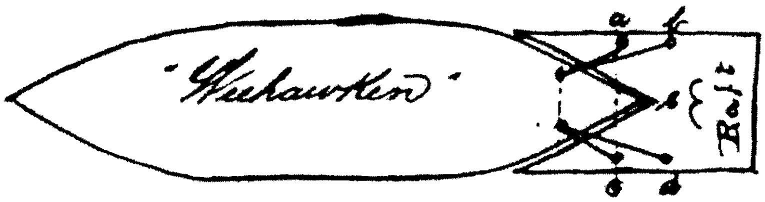

Figure 1. Reproduced from a report from Captain John Rodgers to Rear Admiral S. F. Du Pont dated 20 April 1863 discussing the problems in using the raft during the attack on Charleston—not drawn to scale (Navy Dept. 1971: VI-384).

to another vessel. At any rate a song was composed following the event:

> 'Hurrah! hurrah! good news and true,
> Our woes will soon be past;
> To Charleston, boys, all praise be due.
> The devil's caught at last.
> He's caught, he's dead, and met his fate
> On Morris Island's sands;
> His carcass lies in solemn state
> The spoil of Rebel hands.
>
> (Moore, 1971)

The use of anti-torpedo rafts against the harbour defences at Charleston was apparently a failure, but what of the three rafts lost at sea en route to Port Royal from New York?

One day in 1868, a group of men, gathered near the Mount Hill Lighthouse in Bermuda, saw a curious speck on the horizon which appeared to be neither boat nor derelict. Setting sail in a small sloop, they found the strange craft was a large raft with a wedge-shaped section cut out of one end. Heavily encrusted with barnacles, the raft was made of heavy balks of timber held together with a great number of heavy iron bolts. The prospect of recovering such a quantity of timber (on Bermuda where lumber has always brought a premium price) encouraged an effort to bring the raft ashore. After several days of extraordinary effort, the raft was beached at Dolly's Bay. Unfortunately for the would-be salvors, the raft was so massively built and extensively fastened that all attempts at dismemberment were strongly resisted and the raft was abandoned to rot.

In 1872, Captain E. H. Faucon of the U.S. Navy arrived in Bermuda, and during his stay someone took him over to Dolly's Bay to look at the odd raft lying in the tidal flats. He is quoted as saying, upon viewing the raft, 'never did I expect to be shipmates with that again', and pointed out the government number, the step for the flagstaff and many of the features of the raft that had been in tow from New York to Port Royal when he had captained the *Ericsson* on its ill-fated mission (Zuill, 1963). In an interesting aside, Captain Faucon was commander of the *Pilgrim* when Richard H. Dana was a sailor aboard, gathering material for his famous book, *Two Years Before the Mast*.

Maritime surveys of surface currents have demonstrated the existence of a Gulf Stream eddy connecting the coast of North Carolina and Bermuda; the presence of the Civil War raft gives additional evidence for such currents (Gardner, 1965).

Now comes the investigation of what is undoubtedly a Civil War anti-torpedo raft on the lower Coast of Texas (Figs 2, 3). In 1980, Hurricane Allen unearthed three fragments of a massive structure consisting of layers of criss-crossing timbers fastened by wooden dowels and iron rods an inch or more in diameter, tentatively identified by Dan Kilgore, Honorary Curator of History at the Corpus Christi Museum, as a Civil War anti-torpedo raft (Shol, 1980). Parts of the wooden structure have been burned and broken off by natural and human agencies but the structure is, in terms of construction, very similar to the raft identified on the shores of Dolly's Bay, Bermuda.

On 12 October 1985, the senior author directed 26 volunteers from the Coastal Bend Archeological Society and the Webb County Archeological Society in an investigation of the raft. Assisted by B. Arnold of the Texas Antiquities Committee and T. Oertling from Texas A&M University's Institute of Nautical Archeology, the remnants of the raft were pedestalled, photographed, measured, and investigated at length.

Figure 2. View of anti-torpedo raft centre section, looking northward.

Subsequent to this event, Hurricane Juan, in November of the same year, reburied the wreck such that only a few of the iron bolts extend above the sandy surface on the beach at Mustang Island.

Recent investigations give rise to the question of how a Civil War anti-torpedo raft would end up beached on the lower coast of Texas. No identifying marks were discovered on the raft remnants. Could this be one of the three rafts lost by Lt. Faucon en route from New York to Port Royal in 1863? If so, the raft would have had to have been picked up by the northern equatorial current in the mid-Atlantic, drifted through the Caribbean and entered the Gulf Stream in the Gulf of Mexico to eventually come to rest on Mustang Island. As unlikely as this may seem, much of the seaweed from the mid-Atlantic Sargasso Sea ends up on the Texas Barrier Islands, so it is not outside the realm of possibility that the raft made such an odyssey.

An alternative explanation is that this anti-torpedo raft was used in an attempt to penetrate Confederate defences at Aransas Pass, Texas, in 1862, or elsewhere in the Gulf. On the 18th of August of that year the bark *Arthur*, the *Sachem* and the *Corypheus* joined together in an attack on Corpus Christi, Texas, forcing the burning of three Confederate vessels and engendered a minor panic in the town with a limited bombardment (Navy Department, 1971).

Since the earliest records of anti-torpedo rafts date to 1863, it seems unlikely that they were employed at Corpus Christi.

One of the puzzling observations made at the Mustang Island raft site is the absence of barnacles on the timbers. If the remnants represent a Civil War relic that spent several years afloat in

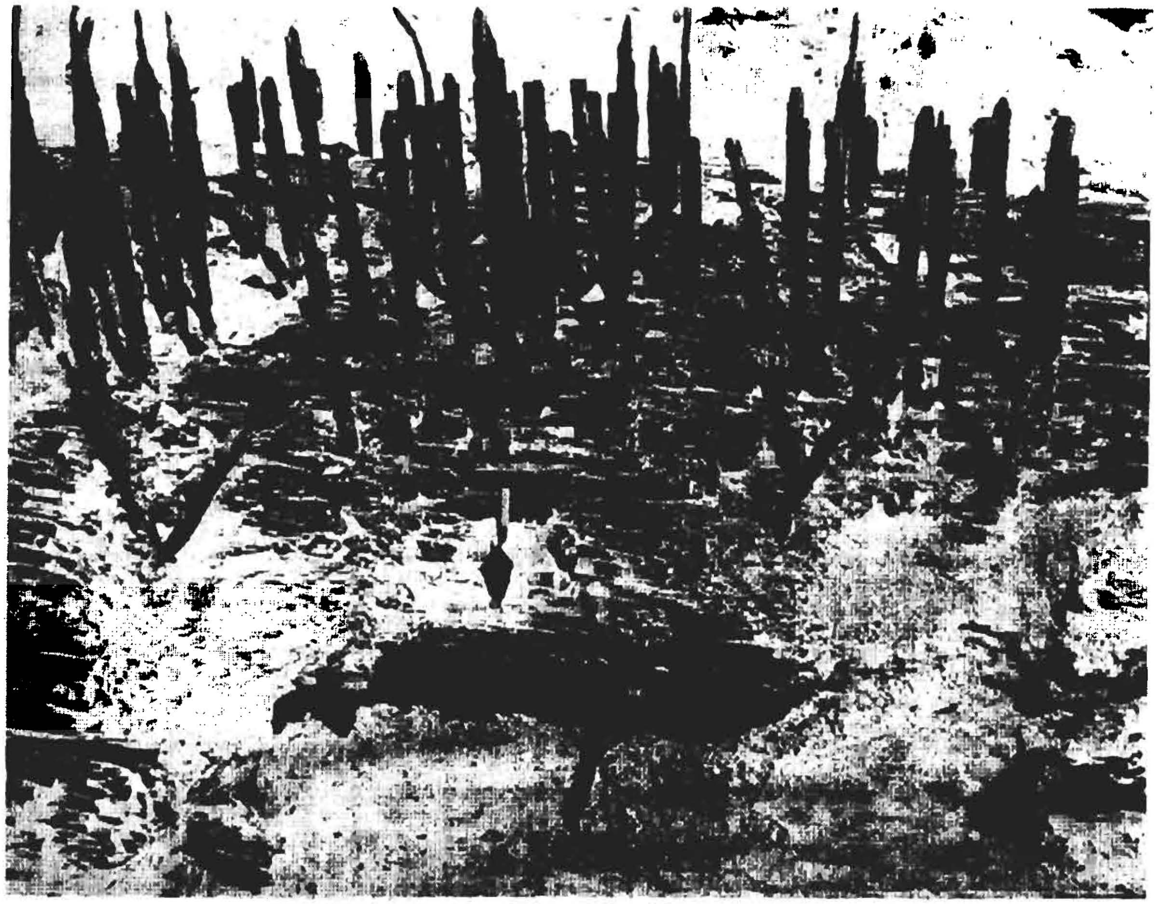

Figure 3. Close-up of centre section of anti-torpedo raft, looking northward.

the Caribbean, why are there no marine shell attachments?

Magnetometer survey (Fig. 4)

The presence of the anti-torpedo raft on the beach at Mustang Island provided the opportunity for acquiring magnetometer data from such a structure under ideal, almost laboratory, conditions. Four lines of data across the site were recorded. Each line intersected at a given point at roughly the centre of the site, forming an asterisk-like pattern. This method was selected rather than the grid pattern more usual in land magnetometer survey, because it was desired that the lines of data be analogous to the data that would be acquired during a marine magnetometer survey. The survey was run after the structure had been excavated, but this factor is of no consequence since the overburden is transparent to the magnetometer in any case. The land survey sensor was placed at the top of the standard aluminum pole supplied with the Geometrics proton precession magnetometer. The minimum distance to the target was the length of the pole measured from the bottom to the centre of the sensor, 8′5″ (2·59 m). The magnetometer used was the Texas Antiquities Committee's Geometrics Model 806. Readings were listed by hand and taken at a three foot interval. Data was acquired between 1510 and 1611 hours on 12 November 1985. Readings on the diurnal variation of the earth's magnetic field were taken by returning to a single given location five times spaced throughout the survey period. Only a four gamma variation was observed, a change of no significance for our purposes here, considering the size of the anomalies recorded.

The first line of data was taken at a bearing of about 330 degrees, which paralleled the long axis of the main piece of wreckage. Line 2 was taken

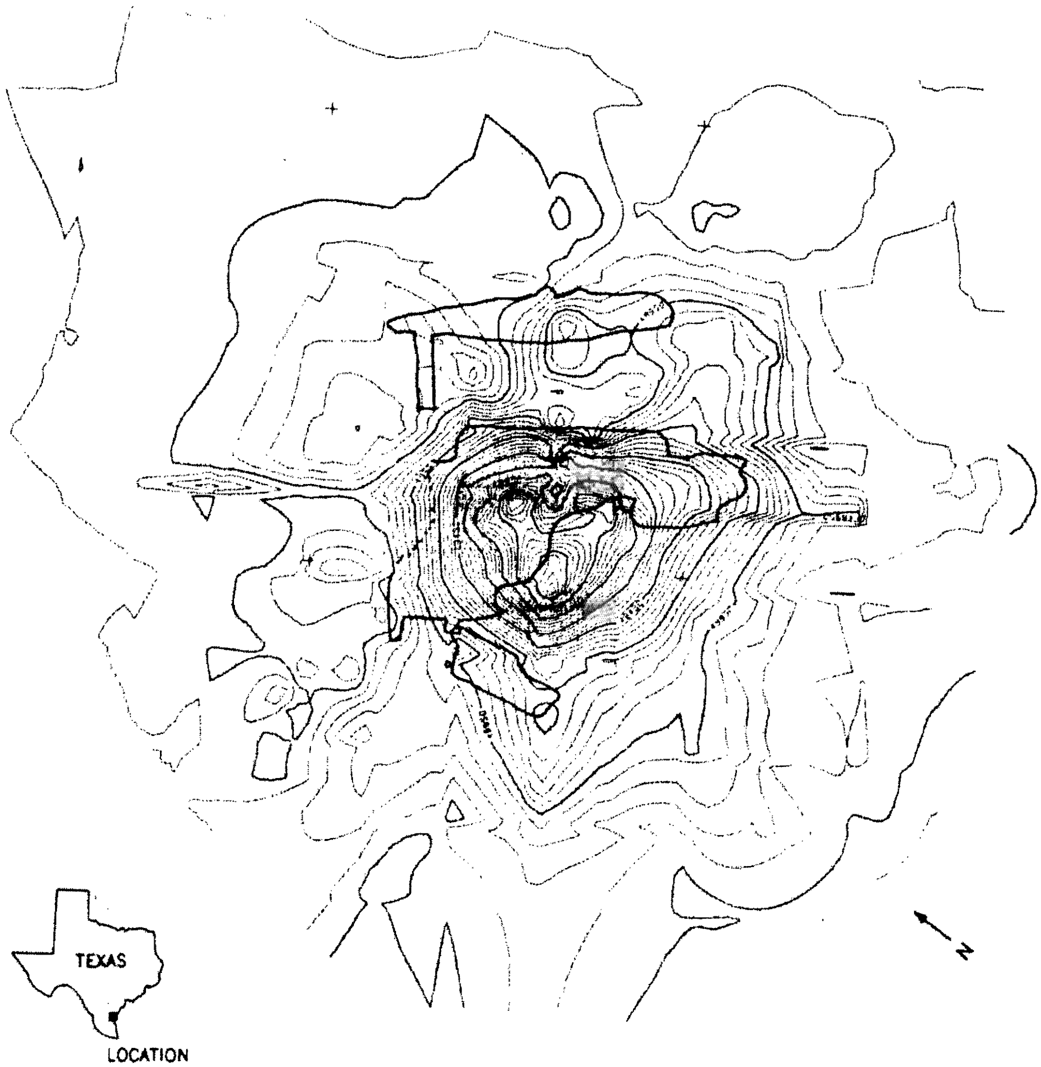

Figure 4. Graph of magnetometer results plotted against the outlines of the raft remains.

perpendicular to the first. Lines 3 and 4 were perpendicular to each other and spaced at an even 45 degree angle to the first lines.

Simulated strip chart records were prepared for each of the four transects in order to analyze the data from the perspective of a marine survey (Fig. 5). As theory would predict, the direction of the passage of the sensor relative to the orientation of the structure did produce major differences in the signature on the strip chart. Similarly, those lines which passed over the scattered sections of the raft produced multiple magnetic peaks. The gradient was so sharp at the centre of the anomaly that there was as much as a ± 50 gamma variation in sequential readings at the same spot. This may indicate that the magnetometer was on the verge of losing phase. The normal background noise level was ± 1–2 gammas.

Of particular importance is the very localized nature of the anomaly. At a distance of only 26 ft (7·92 m) from the edge of the structure and 45 ft (13·71 m) from the centre of the maximum 1890 gamma anomaly recorded on line 2, the readings were back to the normal ambient. In theory, the strength of an anomaly drops off in proportion to the inverse cube of the distance for a dipole and at the inverse square for a monopole

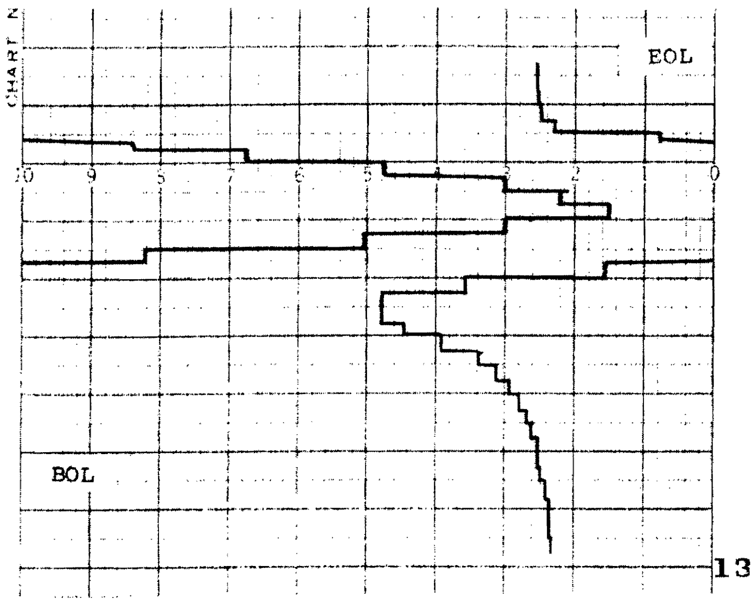

Figure 5. Anti-torpedo raft magnetometer survey stimulated strip chart record line 1, 1000 gamma scale.

(Breiner *1973: 20–21*). Using this formula for a dipole the predicted strength of the anomaly at a 45 ft (13·71 m) distance would be about 7 gammas. Utilizing the inverse square of the distance, we would expect an anomaly strength of about 64 gammas at the same distance. The observed anomaly is largely a positive monopole in nature. Perhaps the more rapid than predicted drop off observed in the present case is attributable to the structure which consists of numerous large iron fastenings oriented vertically to the ground surface.

The implication of this data is important in planning and assessing magnetometer survey strategies. The anomaly caused by this sizable portion of an anti-torpedo raft would easily fall undetected between 50 m (164 ft) spaced survey tracks. It could conceivably do the same with 30 m (98 ft) tracks. In neither case would one detect a pair (or more) of anomalies on neighbouring tracks, which is usually considered to be the first indication of a significant anomaly worthy of further investigation, possibly indicative of a shipwreck site. In setting the track spacing for a survey, one plans with the object of getting at least a pair of anomalies on neighbouring tracks.

The above factors demonstrate once again that 100% coverage with regard to magnetometer surveys is an elusive goal. Closer and closer spacing of survey tracks soon ceases to be practical or cost effective. One must simply bear in mind the fact that the coverage is a sample. This experiment also points up the importance of the variable of the target's orientation to the earth's field. This has a large impact on the size of the anomaly recorded. Unfortunately, the orientation of the target is an imponderable variable.

The pattern of data collection was not optimal for contouring, but in spite of this a computer drawn contour plot was generated. The data was more than dense enough in the central portions of the site, and the interpolation routine of the CPS-1 software selected (Unitech 1973) was excellent so the more distant portions of the plot should be reasonably accurate. There is no substitute for these graphics in providing a visualization of the magnetometer data.

Analysis of anti-torpedo raft construction

The first impression that the anti-torpedo raft remains on Mustang Island makes on the viewer is its massive construction. Large softwood timbers, some almost 14 in (0·33 m) square, are treenailed and bolted together vertically and bolted horizontally. In the centre part of the remains the bolting pattern is so dense that one cannot pass a spread hand around a bolt without touching another. This structure was obviously meant to take a lot of punishment and keep going.

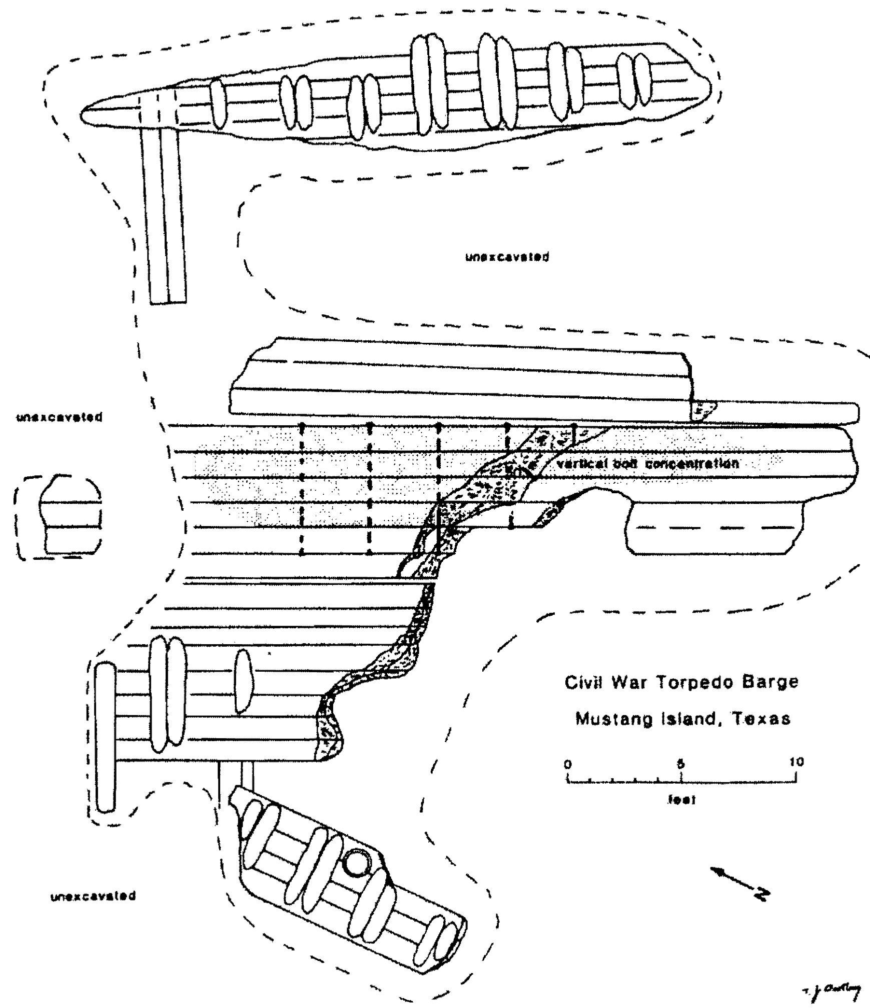

Figure 6. Sketch of raft remains 41NU153—shaded area shows highest concentration of vertical bolts.

Nevertheless, time and the elements have broken up the structure into three main fragments. Other pieces are reported to be scattered about the beach as is evidenced by one timber protruding from the bottom of a sand dune some 50 ft (15·24 m) away. Of the large fragments remaining, no edge of the original structure could be definitely identified. The remains are scattered over an area of *c.* 38 ft × 35 ft (11·58 m × 10·66 m). The major intact timbers are oriented at 330° or roughly NW/SE. These are 14 in (0·35 m) in height and vary in width from 6, 9, 10, 12, and 14 in (0·15, 0·22, 0·24 and 0·35 m). Several of these timbers were laid together and fastened horizontally with 62 in (1·57 m) bolts which were spaced 36 in (0·91 m) apart. This created a 14 in (0·35 m) by 5 ft 2 in (1·57 m) 'timber unit.' The length could not be determined, but the occasional butt join of two timbers in the timber unit suggests that the timber unit ran the length of the raft (Fig. 6).

The centre section is the largest and is most notable for the dense forest of iron bolts, some standing up to 3 ft above the remains of the raft. Visually this is the most diagnostic feature for identification of the remains. The similarity to the Bermuda example is unmistakable (cf Navy Dept. 1971: VI-381–VI-384). The remains are comprised of two courses of timbers running NW/SE. The northern section is also composed of two courses of NW/SE timbers with the remains of paired beams running NE/SW. There is also one pair of NE/SW beams under this section and running toward the centre. No others were visible under this part of the structure. The smallest section is on the SW side and lies at an angle (to) the centre section. It also has two courses of the timber units running NW/SE with paired cross beams running NE/SW on top of these and spaced *c.* 3 ft (0·91 m) between centres.

Beneath the SW section another set of paired NE/SW beams runs under the remains. No other beams were found at any other place which ran under the structure even though excavations were made at various points to this level. It is probable that occasional paired beams ran completely across the raft to provide additional strength over the whole structure.

One final feature of interest is the circular hole 16·5 in (0·41 m) in diam. cut through the two courses of timber. On the underside there was a metal plate of indeterminate size which constricted the opening by about 4 in (0·10 m). No similar feature was found on the opposite side of the raft. Based on the position of this plate on the underside of the raft, the presence of bolt heads on the underside of the raft, the lack of heads on any of the vertical bolts, and the presence of other NW/SE timbers denoted by the extra length of these bolts, we conclude that the raft structure is upside down. The raft was in all probability driven to its present position far on shore by a storm, the waves of which flipped the structure as it reached the beach.

Reconstruction

When the raft was built, it was necessary to raise it off the ground in order for workmen to have access to the bottom to pean over the ends of the bolts. To raise the raft the 5 ft (1·52 m) necessary to pass the longest bolts seems excessive and supports the idea that the raft has flipped. A spine of two courses of timbers was laid and treenailed together. The lower may have been narrow, perhaps two or three timbers wide and the second was probably the width of a standard timber unit. Parallel runs of two or three timbers were placed at a distance on each side of the spine at the level of the second course and defined the width of the raft. The bolts rising above the ends of the paired beam ends on each side of the raft is the only evidence that limits of the structure are in fact the sides of the raft.

Across the three sets of timbers the pairs of cross beams were positioned and treenailed in place. Over these the two courses of timber units were set in place, each being treenailed to the timbers below it. Care was taken that mortices were cut to accept the heads of the horizontal bolts in the adjacent timber unit. Occasional pairs of beams were placed across the timber units. They either secured the two courses of timber units to the cross beams below and/or provided points of attachment for the chains or hawsers from the vessel pushing the raft.

Once all the timbers were in place and treenailed, one timber to the next, holes were bored through the entire structure and bolts passed through. On one side of the raft a hole was cut through the two courses of timber units and between the paired beams. A metal plate with a corresponding hole was placed over it and fastened with copper bolts. The purpose of this port is conjectural, but considering the craft's purpose, it may have been an opening for the chains and grapnels which were meant to catch the torpedoes or their anchor lines. Presumably, items of hardware such as ring bolts, cleats, or bitts were installed to make the towing and pushing of the rafts easier as well as for attachments of the snagging chains.

Conclusion

It is hoped that comparative information on the raft in Bermuda and archival material will shed additional light on these craft of modern warfare. The rafts represent a great expenditure of time, manpower, and materials and denote the serious attitude the Federal naval forces took towards neutralizing the Confederate threat of mine warfare.

Acknowledgements

Herman Smith organized and coordinated the project. He wrote the introduction and excavation sections of the report. Barto Arnold carried out the magnetometer survey, analyzed data, produced the contour plot, and wrote the corresponding section of the report. Tom Oertling did the structural analysis and wrote that section of the report.

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Wong, John E SWG

From: Minnichbach, Nicole C SWG
Sent: Wednesday, August 05, 2009 2:32 PM
To: Wong, John E SWG; 'Jeff P. Turpin'
Cc: Mullins, Henry L SWG
Subject: RE: 41NU153

OK - We already have the SHPO concurrence. We just need to include a special condition on the permit that states this.

Jeff, is there any way you could construct the special condition from the template below? I do not have ready access to the coordinates of both possible wreck sites. Just fill in the blanks and we can attach it as a special condition to the permit (you may need to change my email back to HTML from plain txt). the coordinates do not have to be in the coordinate system I have below - but we just need to have consistent metadata.

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The special condition will bring the proposed undertaking into compliance with 33 CFR Part 325, Appendix C. Thank you all.

Nicole Cooper Minnichbach
Staff Archeologist
USACE, Galveston District
(W) 409.766.3878
(F) 409.766.3064
nicole.c.minnichbach@us.army.mil

-----Original Message-----
From: Steve Hoyt [mailto:Steve.Hoyt@thc.state.tx.us <mailto:Steve.Hoyt@thc.state.tx.us>]
Sent: Wednesday, August 05, 2009 2:03 PM
To: Minnichbach, Nicole C SWG; Jeff P. Turpin
Cc: Mullins, Henry L SWG; Wong, John E SWG
Subject: RE: 41NU153

I concur.

Steven D. Hoyt, MA
State Marine Archeologist
Archeology Division
Texas Historical Commission
PO Box 12276
Austin, TX 78711-2276
512-927-7882
fax 512-927-9797
www.thc.state.tx.us

-----Original Message-----
From: Minnichbach, Nicole C SWG

[mailto:Nicole.C.Minnichbach@usace.army.mil <mailto:Nicole.C.Minnichbach@usace.army.mil>]
Sent: Wednesday, August 05, 2009 2:00 PM
To: Jeff P. Turpin; Steve Hoyt
Cc: Mullins, Henry L SWG; Wong, John E SWG
Subject: RE: 41NU153

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Thank you.

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-----Original Message-----
From: Jeff P. Turpin [mailto:jpturpin@gvtc.com <mailto:jpturpin@gvtc.com>]
Sent: Wednesday, July 29, 2009 9:16 AM
To: Steve Hoyt; Minnichbach, Nicole C SWG
Subject: 41NU153

Steve and Nicole--

At the request of the City of Port Aransas and their consultants, HDR, I performed a reconnaissance survey yesterday of the two areas purported to house 41NU153, the Civil War torpedo raft. One of these areas was intensively surveyed in 2004, as indicated in the Newport Beach contract report currently under regulatory scrutiny in THC offices. As you already know, the Atlas currently shows two icons for the location of the raft.
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icon labeled 41NU153 is ca. 3 miles north of Port A, around mile post 24, and in roughly the same micro-disposition recorded on the original site form--at the base of the historic dune wall, facing the Gulf, and in site of the waterline. The second, free-floating icon, is about 5 miles north of Port A around mile post 42, matching the macro-location described on the original site form, but is too far inland and in the wrong disposition relative to the dune wall and beach to be considered exact.

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evidence of the raft was found in either location.

In both cases the most likely locations for the raft are currently buried by 2-3 m of relatively new sand, from beach maintenance and seaward dune aggradation. Consequently physical expression of the raft on the surface is highly unlikely, and would not be expected. The possible search areas are too large, the raft too small, and the depth of burial too deep, for shovel tests to be of any help in relocating it.

The obvious remaining tactic is remote-sensing, and we have the capability of finding the wreck (if it is still located at either area) and refining its horizontal and vertical location via mag-sweeps and ground-penetrating radar but, given the size of the potential survey area, I anticipate this requiring from 2-4 days of field work. If and when an anomaly of similar size and magnetic magnitude is located in one of the two areas, it is likely that the only way to confirm that this is the torpedo raft is with excavation, in a manner capable of removing 2-3 m of relatively fresh, mobile sand.

The City is uncomfortable with the scale and potential cost of the initial survey effort, and has asked me to find out whether, since the wreck is at least apparently now out of harm's way, this extensive survey effort is necessary. I should also add that hand-excavation to confirm identity would be very inefficient and time-consuming, and that backhoe-trenching could potentially be damaging to the raft. Consequently, if remote-sensing is deemed necessary, I would like to suggest that comparison of mag-signatures, depth, and size of anomaly be considered confirmation, rather than that excavation be employed for exact ID.

Please give the above information your consideration. Do permit requirements mandate exact relocation of the raft? Or is it currently considered "protected?" Any information you can provide to help resolve this matter will be greatly appreciated. As always, I am available to answer questions at 512-922-7826. Thanks again. jt

Jeff P. Turpin, President
Turpin and Sons Inc.
Cultural Resource Management
2047 Lakeshore, Canyon Lake, TX 78133
(512) 922-7826

Wong, John E SWG

From: Pollack, Jeffrey [Jeffrey.Pollack@hdrinc.com]
Sent: Wednesday, August 12, 2009 1:40 PM
To: Jeff P. Turpin; Wong, John E SWG
Subject: RE: 41NU153

Thanks Jeff. John, is this sufficient language from which to craft the permit condition?

-----Original Message-----
From: Jeff P. Turpin [mailto:jpturpin@gvtc.com]
Sent: Wednesday, August 12, 2009 11:50 AM
To: Wong, John E SWG; Pollack, Jeffrey
Subject: Re: 41NU153

Keeping in mind that I went down there last week and demonstrated that both sets of coordinates at the state Atlas were incorrect/inaccurate, a more accurate pair would be (14) 0687047E / 3073160N and 0688740E / 3075746N .
However, these are just approximations of the probably original coordinates, adjusted to fit with the physical descriptions on the original site form, which shows the wreck on the seaward face of the historic dune wall circa 1974. Without a magnetomer relocation of the wreck (which seems to be buried under 2-3 m of new sand dune), this can only be a vague approximation of the location. Hence the need for a buffer. My suggestion is that we elongate the buffer parallel to the dune line, since we at least know that the raft lay on the eastward face of the dune line, so that only the north-south coordinate is really in question. We should probably ask the City to do a mag survey in either buffer area if they plan work there, and to alert their tractor people to the possible presence of the raft, in case they inadvertently grade into it. Obviously this could turn in to a management headache for the City on down the road, if a new development wants to bulldoze a walkway to the beach, etc.
Let me know if I can contribute more info. jt

Jeff P. Turpin, President
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2047 Lakeshore, Canyon Lake, TX 78133
(512) 922-7826

----- Original Message -----
From: "Wong, John E SWG" <John.E.Wong@usace.army.mil>
To: "Pollack, Jeffrey" <Jeffrey.Pollack@hdrinc.com>
Cc: "Jeff P. Turpin" <jpturpin@gvtc.com>
Sent: Tuesday, August 11, 2009 8:58 AM
Subject: RE: 41NU153

Jeff (Pollack),

I assume that you have seen this e-mail trail. You mentioned that a linear avoidance zone would be preferable. Why don't we first see how thes coordinates plot out on a current aerial to evaluate what a radius zone would
do? If I get those coordinates I can plot them out on a Google aerial and TNRIS 2004.

John

John Wong
USACE, CCRFO
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411
361-814-5847 tel
361-814-5912 fax

-----Original Message-----
From: Minnichbach, Nicole C SWG
Sent: Wednesday, August 05, 2009 2:32 PM
To: Wong, John E SWG; 'Jeff P. Turpin'
Cc: Mullins, Henry L SWG
Subject: RE: 41NU153

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* Concurrence

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PERMIT APPLICATION – SWG-2007-01847 JOHN WONG/361-814-5847
CESWG-PE-RCC

ENVIRONMENTAL ASSESSMENT
AND
STATEMENT OF FINDINGS

1. Name and Address of Applicant.

City of Port Aransas
1201 Leopard Street
Corpus Christi, TX 78401

2. Corps Authority. The U.S. Army Corps of Engineers, Galveston District (CESWG) will evaluate the proposed activity under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

3. Project and Site Description. The proposed action consists of the City of Port Aransas (City) conducting beach maintenance. This work is to be done by: (a) removing all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill, (b) relocation of sand/sargassum from the beach area located between the annual high tide line (HTL) and below the mean high tide line (MTL) to beach maintenance storage areas located above HTL, (c) the subsequent placement (non-burial) of decomposed sargassum to areas at or below the MTL, (d) burial of decomposing seaweed on the beach above the mean high tide only during periods when there is an abundance of material in the dunes, (e) repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access, and (f) build an approximately 20-foot-wide berm in order to establish a safety lane located between MHT and the HTL for ingress and egress of emergency vehicles during the one week period in which the Sandfest Festival occurs each summer. The safety lane and any constructed berms will be smoothed out to a target height of 2 inches or less after the special event. During the Sandfest special event, City staff will place large piles of sand above, at or slightly below the HTL for use during the sculpture building contest. The piles of sand, and the sculptures made from them, will be spaced so as to allow ample open beach for use by any nesting turtles. The sculptures and mounded sand will be smoothed out to a target height of 2 inches or less immediately after the event.

The beach maintenance project is located within 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, Texas. The project can be located on the U.S.G.S. quadrangle maps entitled: Port Aransas, Texas. Approximate UTM Coordinates in NAD 83 (meters): North end, Zone 14; Easting: 685521; Northing: 3070683 to Easting: 691676; Northing: 3079308.

4. Background Information. Beach maintenance has been carried out by the City in the past. Past maintenance activities may have been conducted in such a manner which may have required a Department of the Army (DA) permit, however current beach maintenance practices are being done in a manner in which a permit is not required. Future work, as proposed, will need a permit, hence the City's decision to submit this permit application.

5. Environmental Assessment.

a. Purpose and Need for the Work. The purpose of the project is to provide driving lanes and recreational areas free of seaweed and other refuse for those members of the beach-going public that desire such conditions.

b. Alternatives. A key provision of the 404(b)(1) guidelines is the "practicable alternative test" which requires that "no discharge of fill material shall be permitted if there is a practicable alternative to the proposed fill which would have a less adverse impact on the aquatic ecosystem." This is especially true when the proposed project is not water dependent. The applicant must demonstrate that there are no less damaging sites available and that all onsite impacts to waters of the United States have been avoided to the maximum practicable extent possible. For an alternative to be considered "practicable", it must be available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose. Four alternatives were considered based on the following siting criteria.

(1) No Action Alternative. This alternative involves permit denial or withdrawal. Under this scenario, beach maintenance activities will likely continue in the same manner that they are currently done, but with no work in jurisdictional areas. The City has initiated a policy of leaving more natural material in place on the beach and educating the general public that small amounts of beach wash-up (sargassum, sticks, organisms, etc.) are a natural and important part of the beach ecosystem. However, the no-action alternative has been dismissed for multiple reasons. The Texas Open Beaches Act requires that local municipalities and counties bordering the Gulf of Mexico be responsible for cleaning their public beaches to provide the public with free and unrestricted access to and use of the beach by providing a driving area for vehicles to enable safe beach access. A minimal amount of beach cleaning to maintain vehicular traffic lanes and access to recreation areas is therefore mandated by state statute. Further, beach cleaning to maintain traffic lanes is necessary to ensure emergency response access to recreational areas and the surf zone.

(2) Offsite Alternatives. As part of current beach management activities, the City currently engages in year-round collection and removal of non-natural debris for disposal in an off-site sanitary landfill. However, at this time, removal of sargassum for disposal in an off-site municipal landfill has been deemed logistically, financially, and legally impractical. The shear volume of material makes physical collection and transport impractical. In addition, state law

prohibits any sand from being removed from a barrier island. This project is site specific; as such, no alternative sites were considered.

(3) Onsite Alternative 1. Under this alternative, the applicant would conduct beach maintenance by hand. This would involve large crews of city workers working very long shifts and using hand tools such as rakes and shovels. Large trees and other debris could not be moved under this alternative and the number of man-hours required to conduct non-mechanized beach cleaning would result in elevated costs. The applicant has not chosen this option due to its impracticality and high cost. Non-mechanized removal of material other than non-natural debris (e.g. plastics and other trash) has also been dismissed as impractical. The amount of sargassum occurring on Coastal Bend beaches makes non-mechanized collection and removal a physical impossibility.

(4) Onsite Alternative 2 (Applicant's Preferred Alternative). Under the preferred alternative, the applicant would use a combination of mechanical and non-mechanical methods to remove all non-natural material such as lumber, plastic, metal cans, etc. from the beach and to relocate seaweed and sand from driving lanes to other areas above Mean High Water (MHW). The City is actively pursuing mechanical alternatives to the technology typically employed for beach maintenance (e.g. articulated front-end loaders, motor graders, tractors, and dump trucks). Alternative methods and technologies might include the development/manufacture of a beach super-rake and a mesh front-end loader attachment that would facilitate sifting of sand from sargassum.

c. Environmental Setting. Mustang Island is one of a series of barrier islands along the Texas coast. The north end of Mustang Island begins at the Corpus Christi Ship Channel Port Aransas south jetty, and continues south for 25 miles to Corpus Christi Pass. The island is separated from the mainland by Corpus Christi Bay. Mustang Island comprises a total of approximately 80 square miles, all in Nueces County. A belt of dunes 15 to 20 feet average, and up to 35 feet high runs along the Gulf side of the island and nowhere is the island more than two miles wide. The island was formed by the slow, ongoing process of sediment transport, via longshore currents and the gulfstream, from rivers that flow into the Gulf of Mexico—the sediments accreted to form barrier islands. However man-made impoundments of river waters upstream over the last century have reduced the sediment budget of the barrier islands and thus promoting erosion of barrier islands faster than accretion. Barrier islands are important for hurricane protection of the mainland. The vegetation holding the dunes in place is drought-resistant species such as sea oats, beach panic grass, and morning glory. The island animal community is dominated by rodents such as pocket gophers, spotted ground squirrels, grasshopper mice, rice rats and cotton rats. An estimated 600 species of saltwater fish inhabit the waters along the coast. Sea turtles frequent the Gulf of Mexico and nesting by green and Kemp Ridley sea turtles is on the increase. Large numbers of waterfowl and shorebirds are common and inhabit the beach area, most of which are migratory. Sargassum seaweed is a brown algae from the Sargasso Sea that washes up on the beach, often in large concentrations. In the pelagic setting, large sargassum rafts form and are considered to be Essential Fish Habitat. The pelagic sargassum faunal community includes approximately 145 species of invertebrates, 100 species of fish, fungi, micro- and macro epiphytes, 5 species of sea turtles and 19 species of seabirds that specialize in utilization of this habitat. Sargassum often washes up the Gulf of Mexico beaches in large concentrations that contain numerous invertebrates, including small shrimp, crabs and amphipods. These entrapped organisms provide forage opportunities for shorebirds. The lower beach zone where sargassum washes ashore can also be populated with amphipods, polychaetes, and small bivalves, such as coquinas. Typically, moderate to large sargassum concentrations begin to wash up on the beaches in early spring and persist through early summer. Terrestrial foragers of washed up sargassum include coyotes, terrestrial crabs, beetles and flies. Sargassum can act as a natural fertilizer to dune vegetation and also trap wind blown sand, both which serve to stabilize the beach/dune environment.

d. Environmental Impacts. The possible consequences of this proposed work were studied for environmental concerns, social well-being, and the public interest, in accordance with regulations published in 33 C.F.R. 320-330. All factors, which may be relevant to the proposal, must be considered. The following factors were determined to be particularly relevant to this application and were evaluated appropriately.

(1) Historic and Cultural Resources. The National Register of Historic Places has been consulted and stated that archaeological site 41NU153, which is the remains of a Civil War period anti-torpedo raft, appears to be within the project impact area and that care must be taken to avoid the location of the raft with any equipment. The applicant will maintain a 50-meter (164-foot) radius circle centered on two potential site centroids.

(2) Water Quality. Any sand placement that would occur in jurisdictional areas would occur above the MHW. No lasting water pollution will occur.

(3) Endangered Species. The CESWG has initiated and concluded formal consultation with the U. S. Fish and Wildlife Service (FWS). In their response to public notice, the FWS recommended that USACE initiate formal consultation with FWS. The CESWG and FWS have coordinated two renditions of a Biological Assessment (BA). The Corps submitted the initial BA on 16 December 2008 requesting FWS concurrence on the determinations made for each species; on 13 February 2009, the FWS provided acknowledgement and a response to the initial BA and stated that they understood the BA would be revised and finalized with respect to the piping plover and sea turtles. The CESWG submitted a revised BA on 23 February 2009 and the FWS provided a draft Biological Opinion (BO) for CESWG review on 8 May 2009. The CESWG submitted its comments on the draft BO on 19 May 2009 and the FWS transmitted their final BO on that same day, 19 May 2009. The project has been modified to incorporate various conservation measures including: specific maintenance parameters, education of city-staff on

piping plover and sea turtle identification, habitat, and information recording; beach patrols to alert workers of the presence of sea turtles and/or their nests; a habitat monitoring effort, and informational signage. In addition the applicant will compile three annual reports that document beach maintenance activities, changes in beach widths, and turtle and piping plover observations. CESWG intends to place special conditions in the final permit document that address the conservation measures and the FWS' reasonable and prudent measures. The FWS issued an incidental take statement wherein they stated that they anticipate that up to three (3) adult Kemp's Ridley sea turtles and three nests, one (1) adult loggerhead sea turtle and one nest, and one (1) adult green sea turtle and one nest could be taken each year. The FWS determined that this level of anticipated take is not likely to result in jeopardy to sea turtles or destruction or adverse modification of designated or proposed piping plover critical habitat.

(4) Fish and Wildlife Values. As a result of the CESWG' formal consultation with the FWS, the proposed project will have minimal impacts on fish and wildlife values.

(5) Essential Fish Habitat (EFH). No known impacts will occur to essential fish habitat as listed under the Magnuson-Stevens Fishery Conservation and Management Act. Floating pelagic sargassum is listed as Essential Fish Habitat; however, the sargassum proposed for removal has washed ashore and is stranded.

(6) Wetlands/Special Aquatic Sites. The proposed work will not impact any wetland areas in or adjacent to the Gulf of Mexico.

(7) Shoreline Erosion and Accretion. The project itself involves the manipulation of the indigenous sand material and removal of non-indigenous materials such as trash and seaweed along the GOM shoreline. Since sand material will be manipulated between the seaward edge of the base of the fore dune area and across the beach, stopping short of the MTL, the sand budget will not be affected by this activity. As such, the activity is not expected to contribute to beach erosion or accretion.

(8) Recreation. According to the applicant's research, beachgoers visiting the project area have expressed the desire to have a beach area that is free of seaweed/sargassum and other debris instead of an unmaintained beach; as such it is expected that, to some, the recreational value of the area will be enhanced as a result of the proposed project.

(9) Safety. Part of the projects includes removal of excess sand from vehicular travel lanes landward of the bollards. This is intended to maintain traffic flow and allow emergency response vehicles to quickly access to the most heavily populated areas of the beach.

(10) Aesthetics. A substantial proportion of beachgoers prefer clean, groomed beaches that are free of seaweed and trash. However, to some members of the public, the alteration of

any natural processes (such as sargassum deposition) in any portion of the project area is an affront to their aesthetic values. Groomed beaches historically bring additional people and traffic. To those that visit or use portions of the beach where regular maintenance is expected to occur, the project will be a welcome aesthetic pleasure.

(11) Land Use. There are no known land use classifications or coastal zone management plans that would adversely affect the project. The land use in the project area is public, recreational, and undeveloped.

(12) Federal Projects. The project will not adversely impact any Federal Project.

(13) Economics. This project will positively impact tourism in the area and subsequently, the economics of the City of Port Aransas and surrounding areas.

(14) Other Federal, State, or Local Requirements. All required Federal, State, and/or local authorization or certifications necessary to complete processing of this application have been obtained except for water quality certification or coastal zone consistency certification.

The applicant has stated that the proposed activity complies with Texas' approved Coastal Management Program (CMP) and will be conducted in a manner consistent with such program. The Texas Coastal Coordination Council (CCC) submitted a letter, dated 21 December 2007, stating it has been determined that this project is above the Texas Commission on Environmental Quality (TCEQ) thresholds for referral to the CCC. The TCEQ will be solely responsible for determining the project's consistency with the goals and policies of the CMP. This determination will accompany TCEQ's Section 401 certification.

This project is considered a Tier II project. The TCEQ has not yet acted on the applicant's request for water quality certification under Section 401 of the Clean Water Act. The CESWG will provide the TCEQ with a copy of this permit decision document when finalized. The final permit decision document will contain the environmental assessment and mitigation and §404(b)(1) analysis. The TCEQ will then make its determination whether the project will comply with state surface water quality standards in accordance with Section 401 of the Clean Water Act. The CESWG will provide a permit decision to the applicant when the following procedures have been completed. The TCEQ will either provide its certification decision (issuance or denial) to, or request an extension from the CESWG within 10 working days from receipt of the CESWG decision document. If the TCEQ does not provide a certification decision or request an extension within the 10 day period, the CESWG will presume waiver of certification in accordance with 33 CFR 325.2(b) and proceed with the issuance or denial of the permit. If TCEQ requests an extension of time, the CESWG will determine the merit of the time extension request and the length of the extension based on 33 CFR 325.2(b) and notify TCEQ of its intended decision. If the CESWG decides to deny or modify a request for extension, TCEQ will have 10 working days from the date it is notified of the intended action of the CESWG on the request for extension in which to either certify or deny certification.

The Texas Administrative Code requires local governments to comply with Title 31, Part 1 Chapter 15(A), Rule 15.7, which pertains to local governmental management of the beach and dune system. The law is administered by the Texas GLO and mandates that local governments provide public access to the beach either by vehicle or by ingress/egress access ways no further than ½ mile apart in the absence of vehicular access. The City's management of the beach/dune system was adopted by the Texas GLO on 15 February 1995, and more recently amended to be effective 8 December 2005.

(15) Other Factors Considered. The following factors were considered during the evaluation process but were determined to not be particularly relevant to this application: navigation, general environmental concerns, floodplain values, energy needs, flood hazards, water supply and conservation, air pollution, food and fiber production, and mineral needs.

e. Cumulative Impacts. An assessment of cumulative impacts takes into consideration the consequences that past, present, and reasonably foreseeable future projects had, have, or will have on an ecosystem. Every permit application must be considered on its own merits. Its impacts on the environment must be assessed in light of historical permitting activity, along with anticipated future activities in the area. Although a particular project may constitute a minor impact in itself, the cumulative impacts that result from a large number of such projects could cause a significant impairment of water resources and interfere with the productivity and water quality of existing aquatic ecosystems.

The area in which impacts resulting from the proposed project will be felt is limited to the defined project area, which is the northern boundary of the City of Port Aransas at the south jetty, to the northern boundary of the Padre Island National Seashore (PINS) on Padre Island, approximately 7.7 miles south of the Kleberg County Line.

Possible impacts in the area are those to sea turtles and their nests, and disturbance to the threatened piping plover's critical habitat as a result of operating heavy machinery on the beach. Impacts to sea turtles nests could occur from the inadvertent crushing of nests by vehicles and/or heavy equipment and the inability of hatchling turtles to traverse tire ruts left by machinery. The CESWG, in coordination with the applicant, has completed formal consultation with the FWS and will incorporate various conservation measures to minimize these impacts. Conservation measures include employing trained monitors to patrol the beach before and during maintenance activity and grading the beach so that tire ruts are no more than two inches deep. Another possible impact is the loosening of sand due to its manipulation so as to render it less compacted and thus, more easily dispersed by wind action. However, these impacts would occur without beach maintenance activities because vehicles are allowed to drive along the entire beach between MHW and the toe of the first line of dunes. Another possible impact of the activity is that it may cause the foredune area to become unstable and less protective during storm events.

Other actions - past, proposed, and reasonably foreseeable - that have had or are expected to have impacts in the same area are the expected beach maintenance projects of other local governmental entities. The CESWG Corpus Christi Field Office is currently evaluating permit application SWG-2008-01272 for a similar beach maintenance project by Nueces County to maintain the beach area immediately north of Lantana Drive thence north to the Port Aransas south jetty, which is immediately adjacent to the north of this project area. There are two other projects which involve movement of sand onto the beach by the Town of South Padre Island. DA permit SWG-2007-01276 was issued to the Town of South Padre Island in 2008 for beach nourishment along the eroding public beach within an approximate 6.25 miles of developed beach shoreline extending north from Brazos Santiago Pass. In this project sand will be obtained for potential onshore and offshore areas and placed on the beach. It is likely that the beach nourishment would occur on an incremental basis at different locations, with each event not being less than 1,000 feet in length and not less than 30,000 cubic yards. A request to amend this permit has resulted in Section 7 consultation for sea turtles and piping plover. A second project involves beach stabilization over a 1,600-foot area in the north part of South Padre Island, from Villa Doce Drive to the Andy Bowie county park. This project consists of the installation of sand filled tubes slightly offshore for the purpose of directing and retaining sand on the beach. This proposed project was presented at a pre-application meeting on 2 June 2009 and no application has yet been submitted.

The impacts or expected impacts from these other actions are expected to be similar to the impacts this project may have. The overall impact that can be expected if the individual impacts are allowed to accumulate is likely to be negligible with the exception of the impacts to sea turtles. The FWS issued a "take" statement for endangered sea turtles and all of the other foreseeable projects would likely engage in formal consultation for similar turtle issues. The cumulative impacts to sea turtles and piping plover habitat is considered independently by the FWS when they render their biological opinion; therefore it is appropriate to defer to their assessment of cumulative impacts to threatened and endangered species. Overall however, we believe the project will result in minimal environmental impacts and minimal impacts on fish and wildlife values.

When considering the overall impacts from similar past, present, and reasonably foreseeable future projects, their cumulative impacts are not considered to be significantly adverse. It is likely we will receive similar project applications in the future, which will go through a comparable review process.

f. Findings of No Significant Impact. There have been no significant environmental effects identified resulting from the proposed work. The impact of this proposed activity on aspects affecting the quality of the human environment has been evaluated and it is determined that this action does not require an Environmental Impact Statement.

6. Statement of Findings.

a Coordination. The formal evaluation process began with publication of a 30-day public notice on 9 May 2006. The comment period for the public notice closed on 9 June 2006. Copies of the public notice were forwarded to concerned Federal, State, and local agencies, organized groups, individuals and navigation districts. These entities included but are not limited to the following:

National Marine Fisheries Service (NMFS)
Environmental Protection Agency (EPA)
U.S. Coast Guard (USCG)
Texas Parks and Wildlife Department (TPWD)
Texas Historical Commission (THC)
General Land Office (GLO)
National Ocean Survey, Atlantic Marine Center (NOS)
FWS
TCEQ
CCC

b. Response to the Public Notice.

(1) Federal Agencies. The FWS submitted a letter, dated 31 December 2007, recommending that the project not be authorized as proposed, and that additional information be provided with respect to beach maintenance methods and related equipment, frequency of maintenance, proposed sargassum placement areas, justification for the purpose of the work, and submittal of an alternative analysis. The FWS also requested the history of past work be provided and that formal consultation for threatened and endangered species be initiated.

The NMFS submitted an electronic mail transmission, dated 14 December 2007, stating that they anticipate that any adverse effects that might occur on marine and anadromous fishery resources would be minimal, therefore, NMFS did not object to the issuance of the permit. No EFH comments were received.

No response was received from the EPA.

The proposed action was coordinated with CESWG offices by Internal Review notice dated 7 November 2007. No response or objection was received from any office.

(3) State and Local Agencies. The TPWD submitted a letter, dated 21 December 2007, stating that grooming the beach for aesthetics may accelerate beach erosion and could cover sea turtle nests and therefore should be removed from the project proposal. TPWD also stated that removing sand from the toe of the dune could affect dune growth and that specific detail on the type of equipment to be used should be provided. The TPWD stated that sargassum serves as a stabilizer for the dune system and beach, and also provides habitat for numerous invertebrate and vertebrate species, and critical forage area for many species of wading and shorebirds, including piping plover. The TPWD recommended that the permit not be issued as proposed and that the applicant should consult with resource agencies, revise the current plans and resubmit the application to the CESWG.

The Texas State Historic Preservation Officer submitted a letter, dated 21 December 2007 stating that archaeological site 41NU153, which is the remains of a Civil War period anti-torpedo raft, appears to be within the project impact area and that care must be taken to avoid the location of the raft with any equipment. The applicant has agreed to maintain a no work zone that is a 50-meter (164-foot) radius circle centered on both potential site centroids. By electronic message dated 5 August 2009 the THC concurred with this proposed measure.

The TCEQ submitted a letter, dated 28 December 2007, stating that the removal of sargassum could result of a significant loss of organic matter from the beach and could have an effect on the special distribution of the fauna along beaches, including piping plover. TCEQ stated that the applicant should complete an alternative analysis including efforts to minimize impacts, complete a Section 401 Tier II questionnaire, and develop a compensatory mitigation plan for unavoidable impacts that remain.

(4) Individual and Organized Groups. Coastal geologist Richard Watson, Ph.D. submitted a letter, dated 12 December 2007, objecting to the permit application. Dr .Watson stated that Area A has been stable or showing signs of slight accretion, Area C is significantly eroding, and that Area B is transitional and either eroding, or stable but likely to retreat. Dr. Watson stated that movement of sand from above the HTL and the subsequent placement in a seaward direction should not be allowed, but that the sand should be placed to create new dune areas, or around the dune areas to perpetuate dune growth. Dr. Watson also stated that sargassum removed from below the HTL should be front stacked, mid stacked, or back stacked, but on a permanent basis because temporary stacking and subsequent excavation exposes and denudes the front of existing dune and makes them more susceptible to erosion. Dr. Watson recommended that minor sargassum accumulations on the beach be left intact. Dr. Watson also provided a copy of a study prepared for the Texas GLO titled "*Strategies for Managing Sediment on Public Beaches, City of Port Aransas, Texas*" authored by Kimberly K. McKenna, P.G. The McKenna

report recommends that the practice of scraping travel lanes with heavy equipment during wet season be discontinued and that the City investigate the feasibility of artificially wetting the sand during other times to provide compaction. The McKenna report also recommended that the City use beach equipment that can separate trash and seaweed from wet sand and relocating the bollards 20 feet seaward, presumably so that traffic lane maintenance will take place further from the existing dune faces.

Mr. Johnny French, by electronic message dated 23 December 2007, recommended that an environmental impact statement (EIS) be prepared, that any cumulative impact analysis include both the City of Corpus Christi and the City of Port Aransas beach maintenance projects, and that any analysis take into consideration relevant information derived from a forthcoming sargassum symposium. Mr. French expressed concern that stacking of sargassum would disrupt natural decay processes and result in a loss of nutrients to the dunes. Mr. French recommended that in the event that a permit is issued, that the applicant be required to monitor beach erosion and biological impacts, and that beach maintenance procedures be altered to address any deficiencies or detrimental impacts made known from the monitoring.

The Coastal Bend Sierra Club, by letter dated 29 December 2007, stating that maintaining the beach with heavy equipment adversely affects animals that live in the top layer of sand and also alters the natural beach profile, therefore increasing erosion. The Sierra Club requested that an EIS be prepared and that a pubic hearing be conducted.

The Beach Access Coalition (BAC), by electronic message dated 30 December 2007, suggested that the permit should not be issued until the results of a symposium on beach seaweed removal were known so that better maintenance practices could be incorporated into the permit. The BAC also expressed concern that scraping the beach travel lanes would adversely alter the beach profile. The BAC also questioned the effects that trenching of seaweed into the beach and back stacking would have on the dunes. The BAC requested that an EIS be prepared and that a public hearing be conducted.

c. Consideration of Comments. The comment letters received during the public notice comment period were forwarded to the applicant by letter dated 8 January 2008 and as an attachment to an electronic message, dated 9 January 2008. The applicant responded to the comments from individuals in a letter dated 26 February 2008. In response to comments from FWS and TPWD on piping plover and nesting sea turtles, a Biological Assessment was prepared by CESWG, with input from the applicant, which described in detail work methods and proposed conservation measures to protect adult and nesting sea turtles, and also the piping plover. This included, but was not limited to, restricted hours of operation, onsite turtle patrols prior to and during maintenance, protocol to be taken when turtles are found, turtle related training by FWS for turtle patrols and other city staff associated with beach maintenance, and annual monitoring reports for piping plover. The monitoring report parameters include information on beach width, beach/dune topography, sargassum amounts and bird use with reference to regulated beach activities. As a result, formal consultation was initiated on 13 February 2009 which culminated with a Biological Opinion by FWS dated 19 May 2009. The consultation also resulted in an agreement to continue the practice of retaining indiscriminate patches of sargassum for piping plover, which also will assist in retaining some wind driven sand.

Numerous comments were received regarding the removal of sand from the area in front of the dune for vehicular access and subsequent placement below the HTL. The Texas Administrative Code requires local governments to comply with Title 31, Part 1 Chapter 15(A), Rule 15.7, which pertains to local governmental management of the beach and dune system. The law is administered by the Texas GLO and mandates that local governments provide public access to the beach either by vehicle or by ingress/egress access ways no further than ½ mile apart in the absence of vehicular access. Within the proposed maintenance Areas A, B and C, only the segment from Lantana Drive to East Avenue G would comply with the ½ mile access rule, while other access roads are greater than ½ mile apart. Therefore, for most of the project area vehicular access is apparently necessary for public access to the beach as it relates to Texas law. The applicant has responded that maintenance of the traffic lanes is necessary to keep the surface driveable for reasons of safety and traffic flow. Several recommendation were contained in the McKenna study, including not removing sand during the wet season, exploring the feasibility of wetting the vehicular travel way to compact the sand, and the movement of the bollards by no more than 20 feet seaward. The applicant does not typically remove sand during wet season because the wetness and higher water table compacts the sand and removal is not required. The applicant has indicated that it continues to investigate new equipment and methods for removing sargassum and maintaining the vehicular traffic lane that are less intrusive but still cost effective. Regardless, the City's management of the beach/dune system receives oversight by the Texas GLO, which was adopted on 15 February 1995, and more recently amended to be effective 8 December 2005. In response to requests for the preparation of an EIS and that a public hearing be conducted, this environmental assessment considers the cumulative impacts of other similar projects that currently exist or that reasonably foreseeable. Public hearings are conducted for the purpose of acquiring information or evidence for evaluation of the proposed action. In this instance ample information was submitted in response to the public notice and it is not believed that a public hearing would result in new information, particularly in view of the McKenna study and the formal consultation on threatened and endangered species that were conducted.

Finally, as to comments from the Texas Historical Commission, subsequent coordination between the CESWG staff archeologist and the THC resulted in a conclusion that it is sufficient to condition the permit so that no work will occur within 50 meters of archeological site 41NU153.

d. Findings. The applicant has engaged in extensive coordination with the CESWG and of this coordination, the applicant modified the project plans to incorporate various conservation measures. The conservation measures include: specific maintenance parameters, thorough education of city-staff on piping plover and sea turtle identification, habitat, and information recording; beach patrols to alert workers of the presence of sea turtles and/or their nests; a habitat monitoring effort, and informational signage. In addition the applicant will compile three annual reports; these include reports that document beach maintenance activities on both sea turtle and piping plover observations as well as a report on the agreed on habitat monitoring effort. We find that the conservation measures incorporated by the applicant will accomplish the project purpose and not pose a threat to the continued existence of sea turtles or piping plovers. We find that the concerns regarding the long-term stability of the dunes are satisfied because the applicant does not intend to remove material from the foredune area; in fact, during times of the year when seaweed accumulation is greatest, the City would stack excess sand in the front of the dunes. No removal of sand or vegetation is proposed in the dunes, the foredune area, or at the toe of the dune. Furthermore, when vehicular lanes are maintained, equipment do not operate in such a manner that they dig into the dune face. Information gathered from the Texas Bureau of Economic Geology indicates that the beach erosion rate in the project area is relatively low compared with much of the rest of the Texas coast. Erosion rates in the project area ranges from -6.4 linear feet per year (ft/yr) at the southern part of the project area to accretion of approximately 1.64 ft/yr at Horace Caldwell Pier. Other developed areas along the Texas coast experience erosion rates as high as -46.0 ft/yr. Compared to the remainder of the Texas coast, erosion in the project area is not a significant problem and there is a relatively substantial dune line along this project area so as to provide protection during tropical storm events. We find that the project has considerable public-interest and support. The City relies on beach tourism and has indicated that beach maintenance is necessary to support and sustain tourism in the area. We believe that the impacts associated with the proposed beach maintenance have been minimized to the greatest extent practicable, are minor and will not have an adverse impact on the surrounding areas of the Gulf of Mexico. The following special conditions will be added to the authorization:

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

2. The parameters indicated in the sea turtle monitoring plan included in Attachment "A" must be adhered to for the duration of this permit.

3. The parameters indicated in the Habitat Monitoring Effort included in Attachment "B" must be adhered to for the duration of this permit.

4. In the event that beach maintenance activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the US Fish and Wildlife's (FWS) Corpus Christi Ecological Field Services Office (361-994-9005), the Padre Island National Seashore Sea Turtle Coordinator (361-949-8173, ext 226), and the U.S. Army Corps of Engineer's Corpus Christi Regulatory Field Office (361-814-5847). The finder has the responsibility to ensure that evidence intrinsic to the specimen is not disturbed.

5. In addition to the reports required in Attachments A and B, the applicant shall submit an annual summary to the Corpus Christi Regulatory Field Office by no later than February 1 of each calendar year for each year that this authorization is in effect. The summary should include a description of measures implemented during project activities, success of such measures, incidences, and any recommendations on improvement to those measures.

6. The applicant will avoid any and all construction/excavation activities or other project impacts in the historic property avoidance zone, defined as a 50-meter (164-foot) radius circle centered on both potential site centroids: UTM Coordinates in NAD 27 (meters) 0687047E / 3073160N and 0688740E / 3075746N, South Central Zone 14.

e. Conclusion. We have reviewed and evaluated, in light of the overall public interest, the documents and factors concerning this permit application, as well as the stated views of other interested Federal and non-Federal agencies and the concerned public, relative to the proposed work in navigable waters of the United States. This evaluation is in accordance with the guidelines contained in 40 C.F.R. 230 pursuant to Section 404(b) of the Clean Water Act.

Based on our review, we find that the proposed project is not contrary to the public interest and that a Department of the Army permit should be issued.

FOR THE COMMANDER:

8-24-09

(Date)

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office

EVALUATION OF SECTION 404(B)(1) GUIDELINES - SHORT FORM

APPLICANT: **City of Port Aransas** APPLICATION NUMBER: **SWG-2007-01847**

1. Review of Compliance (230.10(a)-(d). A review of the permit application indicates that:

a. The discharge represents the least environmentally damaging practicable alternative; YES X NO* ___ N/A ___

b. If the proposed discharge is in a special aquatic site and is not water dependent has the applicant clearly demonstrated that practicable alternatives are not available and would not be less damaging; YES X NO* ___ N/A ___

c. The activity does not appear to:
   1.) Violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA;
   2.) Jeopardize the existence of Federally listed endangered or threatened species or their habitat; and
   3.) Violate requirements of any Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies); YES X NO* ___ N/A ___

d. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see values, Section 2); YES X NO* ___ N/A ___

e. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5). YES X NO* ___ N/A ___

2. <u>Technical Evaluation Factors (Subparts C-F)</u> (Where a significant category is checked, add explanation below.)

	N/A	NOT SIGNIFICANT	SIGNIFICANT*
a. Physical and Chemical Characteristics of the Aquatic Ecosystem(Subpart C)			
1) Substrate Impacts		X	
2) Suspended particulates/turbidity impacts		X	
3) Water column impacts		X	
4) Alteration of current patterns and water circulation		X	
5) Alterations of normal water fluctuations / hydroperiod		X	
6) Alteration of salinity gradients		X	
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
1) Effect on threatened / endangered species and their habitat			X
2) Effect on the aquatic food web		X	
3) Effect on other wildlife (mammals, birds, reptiles and amphibians)		X	
c. Special Aquatic Sites (Subpart E)			
1) Sanctuaries and refuges	X		
2) Wetlands		X	
3) Mud flats	X		
4) Vegetated shallows	X		
5) Coral reefs	X		
6) Riffle and pool complexes	X		
d. Human Use Characteristics (Subpart F)			
1) Effects on municipal and private water supplies		X	
2) Recreational and Commercial fisheries impacts		X	
3) Effects on water-related recreation		X	
4) Aesthetic impacts		X	

5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves X ___ ___

* The CESWG has initiated and concluded formal consultation with the U. S. Fish and Wildlife Service (FWS) for potential impacts to piping plover and sea turtles. The FWS transmitted their final BO on 19 May 2009. The project has been modified to incorporate various conservation measures and the FWS issued an incidental take statement wherein they stated that they anticipate that up to three (3) adult Kemp's Ridley sea turtles and three nests, one (1) adult loggerhead sea turtle and one nest, and one (1) adult green sea turtle and one nest could be taken each year. The FWS determined that this level of anticipated take is not likely to result in jeopardy to sea turtles or destruction or adverse modification of designated or proposed piping plover critical habitat.

3. Evaluation of Dredged or Fill Material (Subpart G)**

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

1) Physical characteristics X

2) Hydrography in relation to known or anticipated sources of contaminants X

3) Results from previous testing of the material or similar material in the vicinity of the project ___

4) Known, significant sources of persistent pesticides from land runoff or percolation ___

5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances ___

6) Other public records of significant introduction of contaminants from industries, municipalities or other sources ___

7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities ___

8) Other sources (specify) ___

List appropriate references:

The project is considered a Tier II project. Based on the 29 August 2000, Memorandum of Agreement, between the TCEQ and CESWD, on the Section 401 Water Quality Certification Process in the State of Texas, the Galveston District states that the Section 401 Water Quality Certification has not been received. This permit will not be valid until certification is received. The TCEQ has 10 days from receipt of the decision document to make their certification decision. Once the TCEQ certification decision is received, the Corps will attach it to the decision document and forward the permit decision to the applicant.

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to degrade the disposal sites, or the material meets the testing exclusion criteria. YES _X_ NO* ___

4. Disposal Site Determinations (230.11(f))

a. The following factors as appropriate, have been considered in evaluating the disposal site:

1) Depth of water at disposal site _X_

2) Current velocity, direction, and variability at disposal site _X_

3) Degree of turbulence ___

4) Water column stratification ___

5) Discharge vessel speed and direction ___

6) Rate of discharge ___

7) Dredged material characteristics (constituents, amount, and type of material, settling velocities) ___

8) Number of discharges per unit of time ___

9) Other factors affecting rates and patterns of mixing (specify) ___

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable. YES _X_ NO* ___

5. Actions to Minimize Adverse Effects (Subpart H)

All appropriate and practicable steps have been taken through application of recommendations of 230.70-230.77 to ensure minimal adverse effects of the proposed discharge. List actions taken. YES _X_ NO* ___

1. A sea turtle monitoring plan will be adhered to for the duration of this permit.
2. A Habitat Monitoring Effort will be adhered to for the duration of this permit.
3. In the event that beach maintenance activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the US Fish and Wildlife, the Padre Island National Seashore Sea Turtle Coordinator , and the USACE.
4. The applicant will submit an annual summary to the USACE that includes a description of measures implemented during project activities, success of such measures, incidences, and any recommendations on improvement to those measures.
5. The applicant will avoid any and all construction/excavation activities or other project impacts in the historic property avoidance zone, defined as a 50-meter (164-foot) radius circle centered on both potential site centroids: UTM Coordinates in NAD 27 (meters) 0687047E / 3073160N and 0688740E / 3075746N, South Central Zone 14.

6. Factual Determination (230.11) A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short or long-term environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a. 3, 4, and 5 above) YES _X_ NO ___

b. Water circulation, fluctuation and salinity (review sections 2a. 3, 4, and 5) YES _X_ NO ___

c. Suspended particulates/turbidity (review sections 2a. 3, 4, and 5) YES _X_ NO ___

d. Contaminant availability (review sections 2a. 3, and 4) YES _X_ NO ___

e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5) YES X NO ___

f. Disposal site (review sections 2, 4, and 5) YES X NO ___

g. Cumulative impact on the aquatic ecosystem YES X NO ___

h. Secondary impacts on the aquatic ecosystem YES X NO ___

7. Evaluation Responsibility

a. This evaluation was prepared by: JOHN WONG

Position: Senior Project Manager

b. This evaluation was reviewed by: LLOYD MULLINS

Position: Supervisor, Corpus Christi Regulatory Field Office

8. Findings

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines. ___

b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines with the inclusion of the following conditions: X

1. A sea turtle monitoring plan will be adhered to for the duration of this permit.

2. A Habitat Monitoring Effort will be adhered to for the duration of this permit.

3. In the event that beach maintenance activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the US Fish and Wildlife, the Padre Island National Seashore Sea Turtle Coordinator , and the USACE.

4. The applicant will submit an annual summary to the USACE that includes a description of measures implemented during project activities, success of such measures, incidences, and any recommendations on improvement to those measures.

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c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) Guidelines for the following reason(s): ___
   1) There is a less damaging practicable alternative ___
   2) The proposed discharge will result in significant degradation of the aquatic ecosystem ___
   3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem ___

8-24-09
(date)

LLOYD MULLINS
Supervisor, Corpus Christi Regulatory Field Office

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
CORPUS CHRISTI REGULATORY FIELD OFFICE
5151 FLYNN PARKWAY, SUITE 306
CORPUS CHRISTI TX 78411-4318

September 15, 2009

REPLY TO
ATTENTION OF:

Regulatory Branch

SUBJECT: Permit Application No. SWG-2007-01847

Mr. Michael Kovacs
City Manager
City of Port Aransas
710 W. Avenue A
Port Aransas, TX 78373

Dear Mr. Kovacs:

Two copies of a permit for work in waters of the United States, resulting from your above numbered application, are enclosed for your signature.

Before you accept the permit, please note all terms and conditions and any minor plan modifications that may have been necessary. Please note the enclosed Notification of Administrative Appeal Options regarding this permit.

This letter also contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a combined Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

James E. Gilmore, Appeal Review Officer
US Army Engineer Division, Southwestern
1100 Commerce Street, Suite 831
Dallas TX 75242-1317

Telephone: 469-487-7061; FAX: 469-487-7190

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

Both copies of the permit should be signed and dated in the space provided.

Within ten days, both original copies of the accepted permit should be returned to this office for approval, after which one copy of the permit will be promptly sent to you for retention. This permit is not valid until signed in the issuing office.

Sincerely,

John Wong
Senior Project Manager
Corpus Christi Regulatory Field Office

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: City of Port Aransas	Permit: SWG-2007-01847	Date: 15 Sept 2009

Attached is:		See Section below
X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Lloyd Mullins, Leader U.S. Army Corps of Engineers Corpus Christi Regulatory Field Office 5151 Flynn Parkway, Suite 306 Corpus Christi, Texas 78411-4318 Telephone: 361-814-5851	James E. Gilmore, Appeal Review Officer CESWD-PDS-O, 1100 Commerce Street Suite 831 Dallas, Texas 75242-1317 Telephone: 469-487-7061; FAX 469-487-7189 Email: James.E.Gimore@swd02.usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_______________________________ Signature of appellant or authorized agent.	Date:	Telephone number:

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
CORPUS CHRISTI REGULATORY FIELD OFFICE
5151 FLYNN PARKWAY, SUITE 306
CORPUS CHRISTI TX 78411-4318

September 22, 2009

REPLY TO
ATTENTION OF:

Corpus Christi Regulatory Office

SUBJECT: Permit Application No. SWG-2007-01847

Note: Completion of Work
Postcard Not Sent
because work is
ongoing + never complete
JW

Mr. Michael Kovacs
City Manager
City of Port Aransas
710 W. Avenue A
Port Aransas, TX 78373

Dear Mr. Kovacs:

The above numbered permit has been approved and a signed copy is enclosed for your retention.

Also enclosed are ENG Form 4336 and a copy of "Notice to Permittee" which provides important information for permit administration. To assist us in improving our service to you, please complete the survey found at http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

John Wong
Senior Project Manager
Corpus Christi Regulatory Field Office

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee City of Port Aransas

Permit No. SWG-2007-01847

Issuing Office Galveston District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The authorized action consists of the City of Port Aransas conducting beach maintenance. This work is to be done by: (a) removing all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill, (b) relocation of sand/sargassum from the beach area located between the annual high tide line (HTL) and below the mean high tide line (MTL) to beach maintenance storage areas located above HTL, (c) the subsequent placement (non-burial) of decomposed sargassum to areas at or below the MTL, (d) burial of decomposing seaweed on the beach above the mean high tide only during periods when there is an abundance of material in the dunes, (e) repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access, and (f) the temporary placement of large piles of sand piles below the HTL for sand sculptures associated with the Sandfest Festival, and for a temporary 20-foot-wide berm in order to establish a safety lane located between MHT and the HTL for ingress and egress of emergency vehicles during the Sandfest Festival. The project will be conducted in accordance with the attached plans, in eight (8) sheets.

Project Location: Within a 7 mile segment of Gulf of Mexico beach, on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, Texas.

Permit Conditions:

Rcd
SEP 2 1 2009

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2013. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

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

2. The parameters indicated in the annual sea turtle and piping plover plan included in Attachment "A" must be adhered to for the duration of this permit.

3. The parameters indicated in the Habitat Monitoring Effort included in Attachment "B" must be adhered to for the duration of this permit.

4. In the event that beach maintenance activities result in the direct take (killing, harming, or maiming) of a sea turtle, hatchling, and/or eggs, the person(s) responsible for monitoring sea turtles shall notify the US Fish and Wildlife's (FWS) Corpus Christi Ecological Field Services Office (361-994-9005), the Padre Island National Seashore Sea Turtle Coordinator (361-949-8173, ext 226), and the U.S. Army Corps of Engineer's Corpus Christi Regulatory Field Office (361-814-5847). The finder has the responsibility to ensure that evidence intrinsic to the specimen is not disturbed.

5. In addition to the reports required in Attachments A and B, the applicant shall submit an annual summary to the Corpus Christi Regulatory Field Office by no later than February 1 of each calendar year for each year that this authorization is in effect. The summary should include a description of measures implemented during project activities, success of such measures, incidences, and any recommendations on improvement to those measures.

6. The applicant will avoid any and all construction/excavation activities or other project impacts in the historic property avoidance zone, defined as a 50-meter (164-foot) radius circle centered on both potential site centroids: UTM Coordinates in NAD 27 (meters) 0687047E / 3073160N and 0688740E / 3075746N, South Central Zone 14.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

9/18/09

(PERMITTEE)
CITY OF PORT ARANSAS

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

9/22/2009

(DISTRICT ENGINEER)
JOHN WONG, SENIOR PROJECT MANAGER
CORPUS CHRISTI FIELD OFFICE
FOR COLONEL DAVID C. WESTON

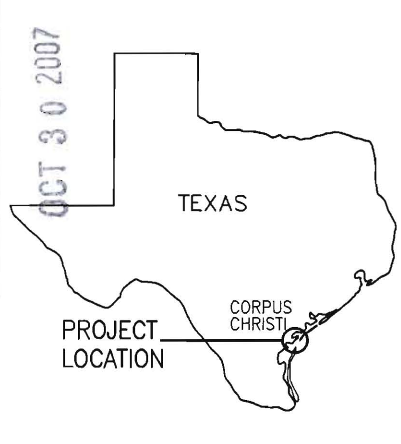
(DATE)

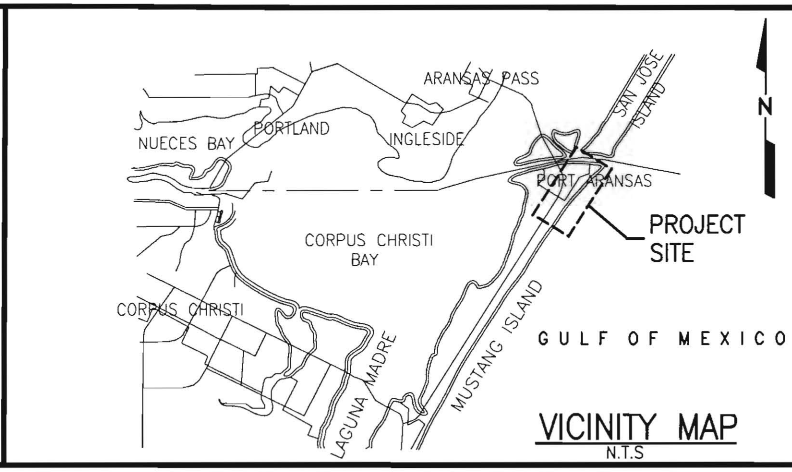
When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

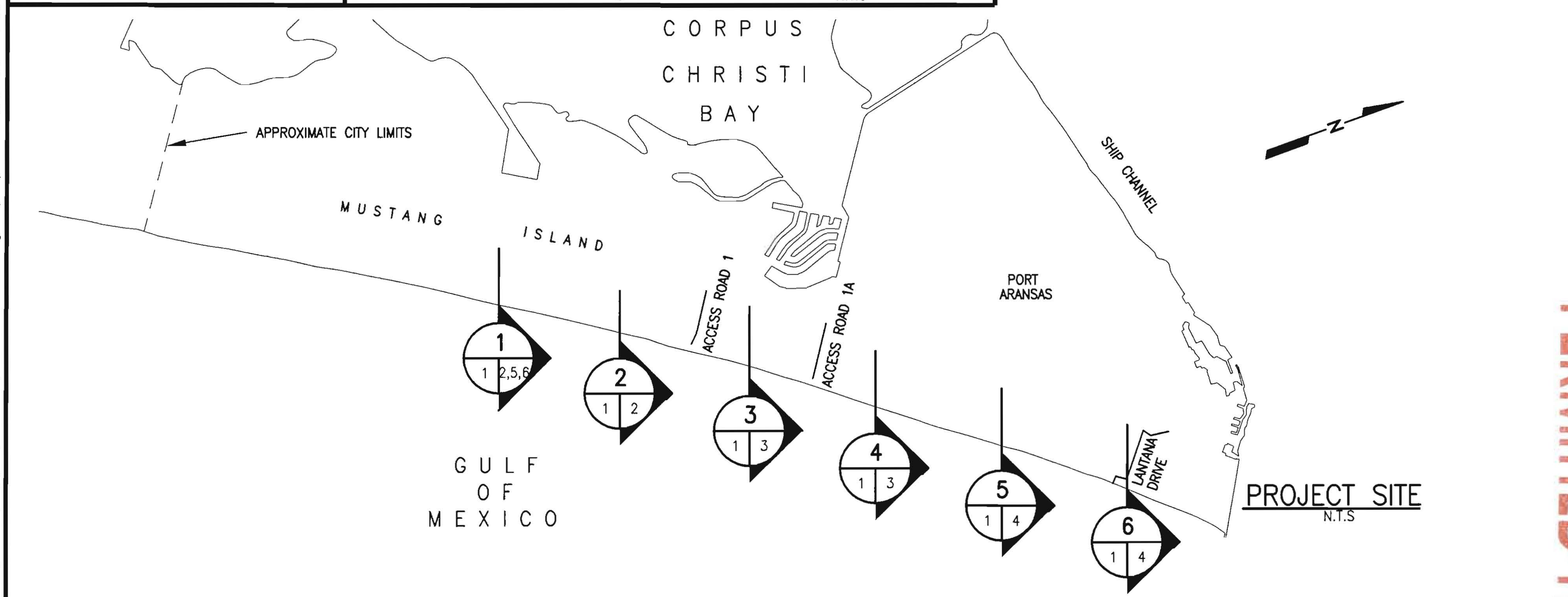
(TRANSFEREE)

(DATE)

PROJECT LOCATION







FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 1 of 8

APPLICANT: CITY OF PORT ARANSAS
PROJECT NAME: GULF BEACH CLEANING
COUNTY: NUECES

DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 01 of 08

PERMITTED PLANS

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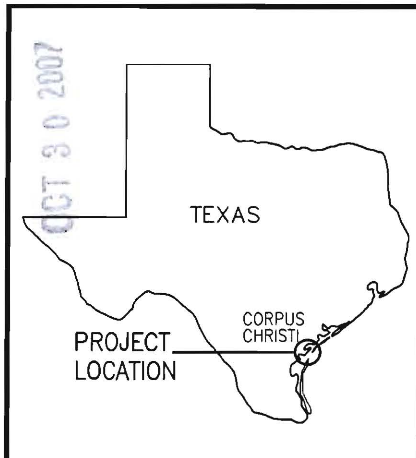
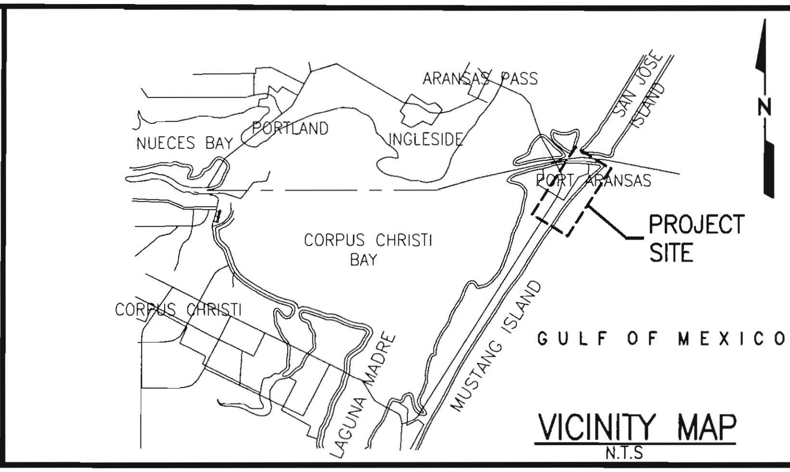
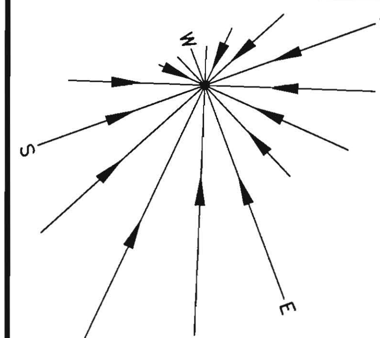
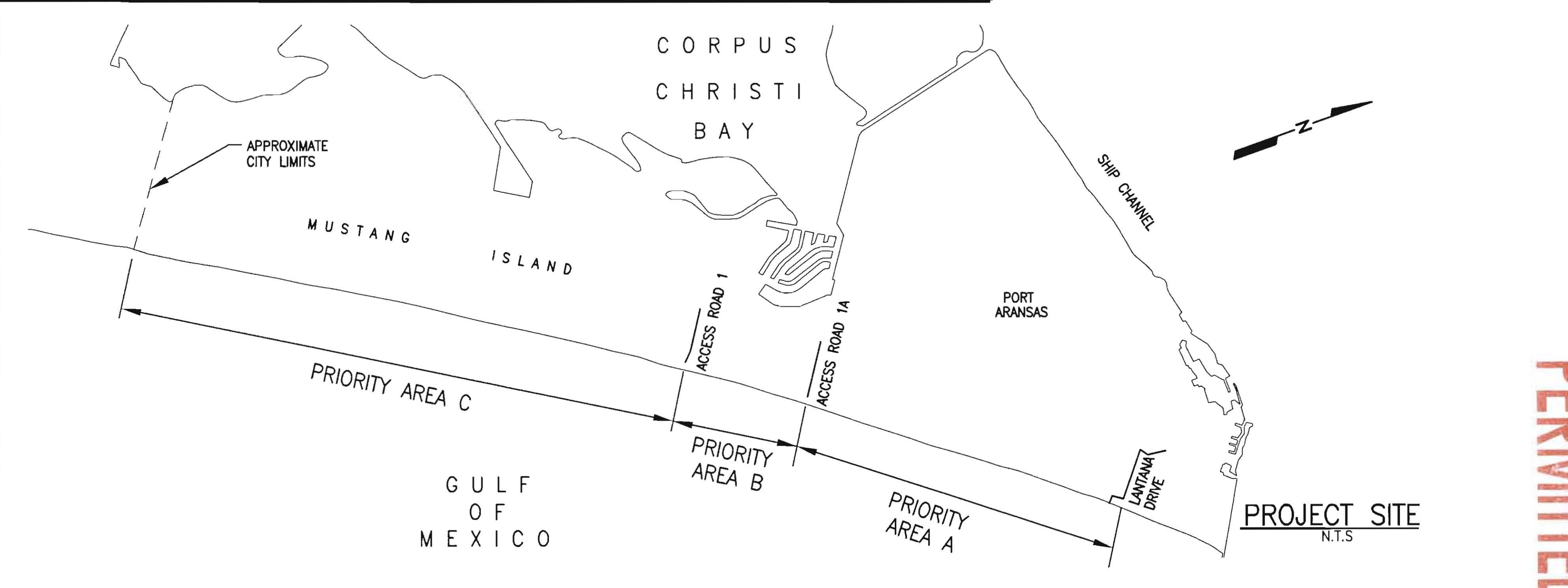
OCT 30 2007

BEACH MAINTENANCE PRIORITY AREAS









FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 2 of 8

APPLICANT: CITY OF PORT ARANSAS
PROJECT NAME: GULF BEACH CLEANING
COUNTY: NUECES

DATE: 08/07	REV. DATE: 8-14-2007	DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107	SHEET 02 of 08

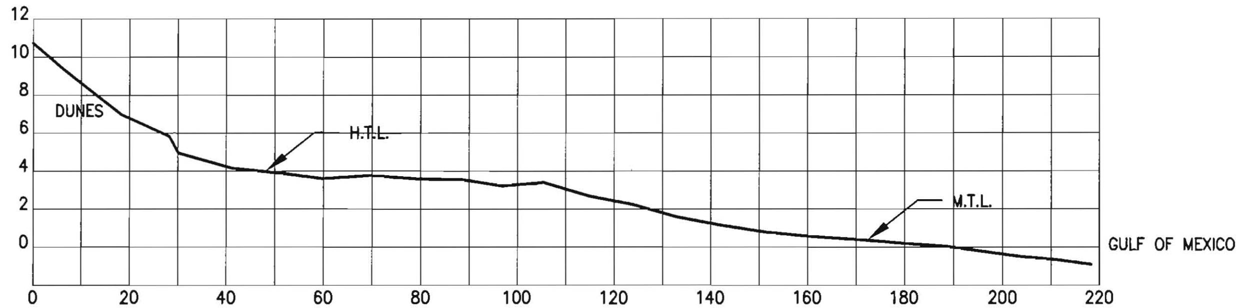
PERMITTED PLANS

EXISTING CONDITIONS 1/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 1 IS LOOKING NORTH AT MIRAGE CONDOMINIUM.
4. SECTION 2 IS LOCATED AT MARKER 48 LOOKING NORTH.

OCT 3 0 2007



2 — 1 | 2 EXISTING CONDITIONS - SECTION

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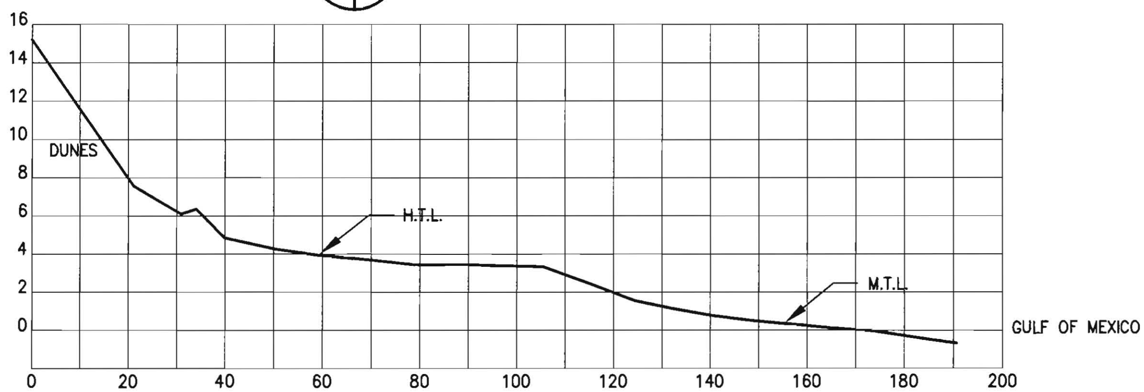

1 — 1 | 2,5,6 EXISTING CONDITIONS - SECTION

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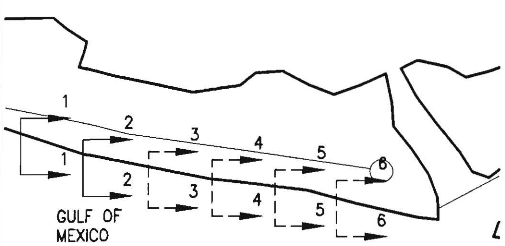


HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

PERMITTED PLANS

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 3 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 08/07 | REV. DATE: 8-14-2007 | DATUM: NAVD'88

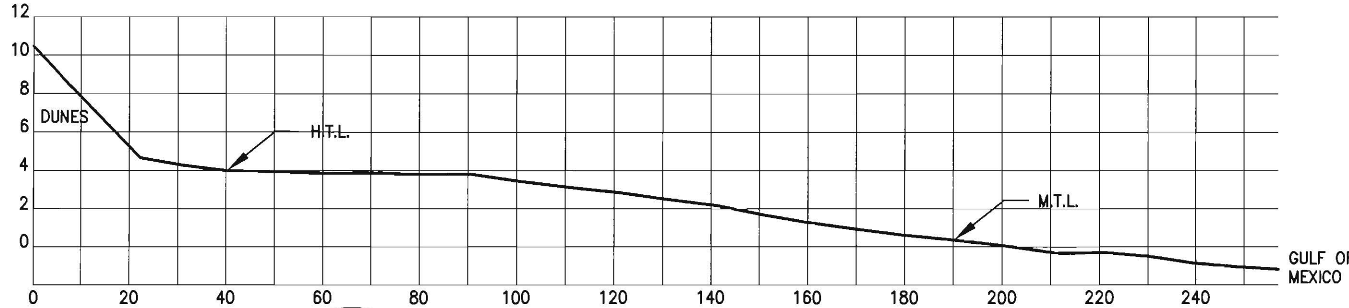
HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107

EXISTING CONDITIONS 2/3

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR|SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 3 IS LOCATED 300' NORTH OF MARKER 35 LOOKING NORTH.
4. SECTION 4 IS LOCATED AT MARKER 22 LOOKING NORTH.



4 — 1 | 3 EXISTING CONDITIONS - SECTION

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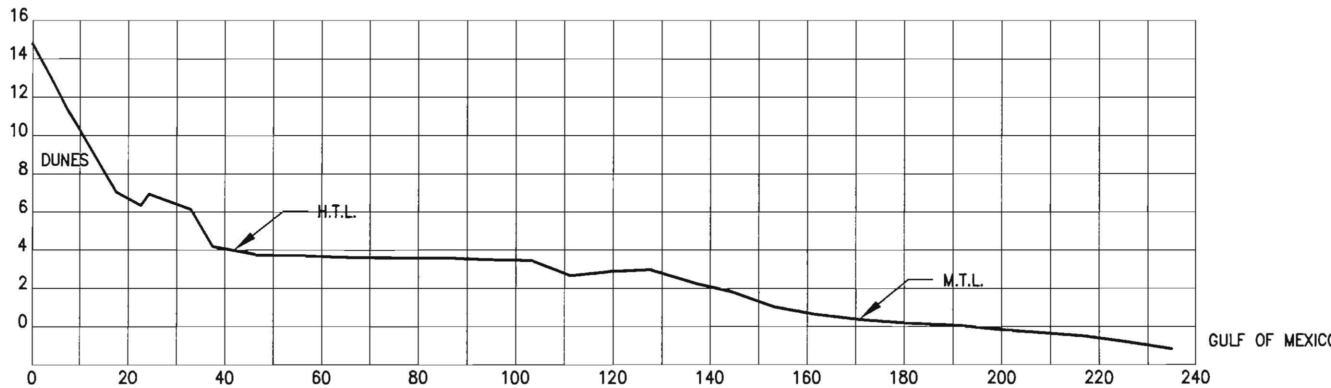

3 — 1 | 3 EXISTING CONDITIONS - SECTION

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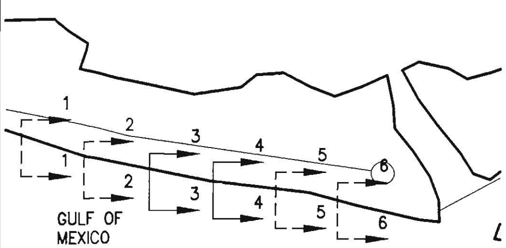


HORIZONTAL 0 20' 40'

VERTICAL 0 5' 10'

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 4 of 8

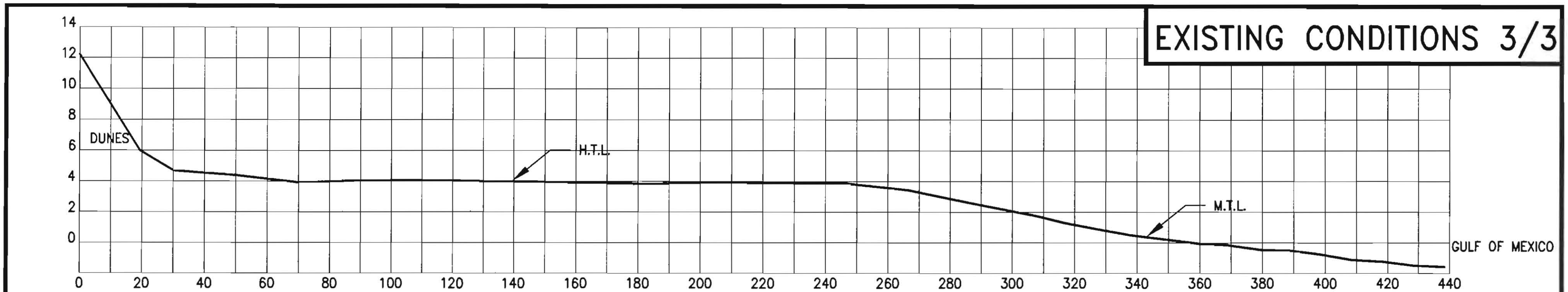
APPLICANT: CITY OF PORT ARANSAS			
PROJECT NAME: GULF BEACH CLEANING			
COUNTY: NUECES			
DATE: 08/07	REV. DATE: 8-14-2007	DATUM: NAVD'88	

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 04 of 08

OCT 3 0 2007

EXISTING CONDITIONS 3/3



6 — 1 | 4 EXISTING CONDITIONS - SECTION

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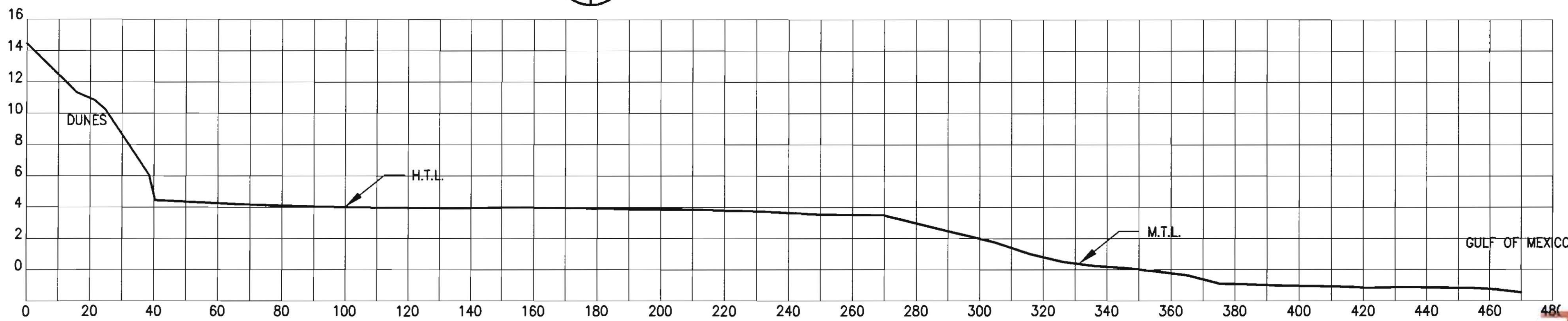

5 — 1 | 4 EXISTING CONDITIONS - SECTION

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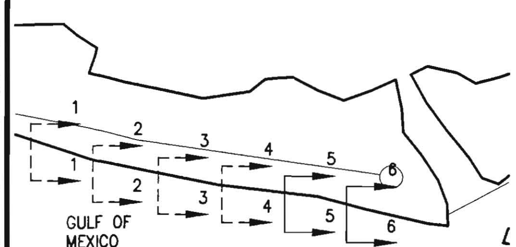

NOTES

1. HIGH TIDE LINE IS OBSERVED BY HDR/SHINER MOSELEY ON 06-04-07; TO BE VERIFIED BY CORPS OF ENGINEERS PERSONNEL.
2. MEAN TIDE LINE AS PER PORT ARANSAS AND BOB HALL PIER TIDE GUAGE DATA.
3. SECTION 5 IS LOCATED AT MARKER 10 LOOKING NORTH.
4. SECTION 6 IS LOCATED SOUTH OF LANTANA DRIVE BY DUNES CONDOMINIUM.

HORIZONTAL 0 25' 50'

VERTICAL 0 5' 10'

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 5 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 08/07 | REV. DATE: 8-14-2007 | DATUM: NAVD'88

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 05 of 08

PERMITTED PLANS

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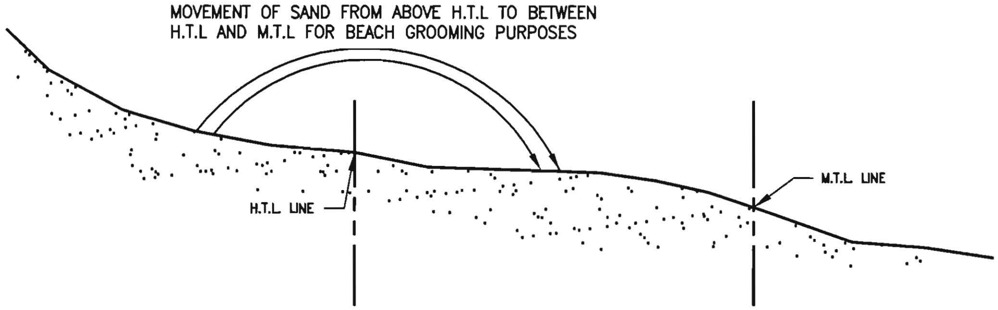
PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 | 2,5,6 PROPOSED MAINTENANCE – TYPICAL SECTION
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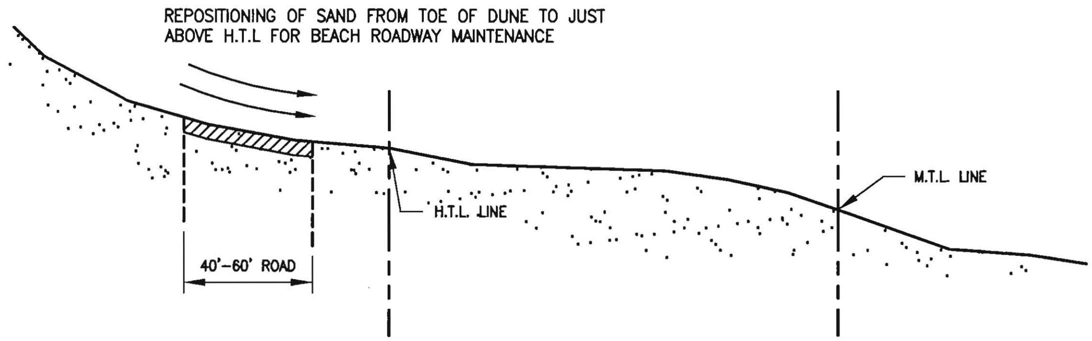


2 | 5 | 5 PROPOSED MAINTENANCE – TYPICAL SECTION
SCALE: N.T.S.

FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 6 of 8

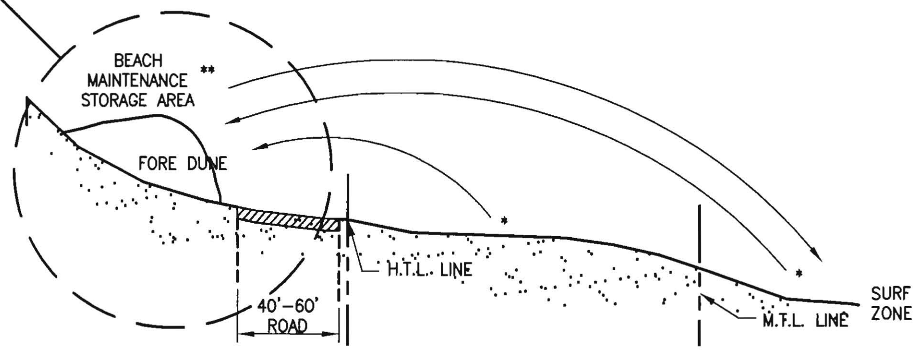
APPLICANT: CITY OF PORT ARANSAS			
PROJECT NAME: GULF BEACH CLEANING			
COUNTY: NUECES			
DATE: 06/07	REV. DATE: 8-14-2007	DATUM:	

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 06 of 08

PROPOSED BEACH MAINTENANCE PRACTICES

1 / 7 | 8 — SEE DETAIL FOR ALTERNATE PLACEMENT AREAS ON SHEET 8 OF 8



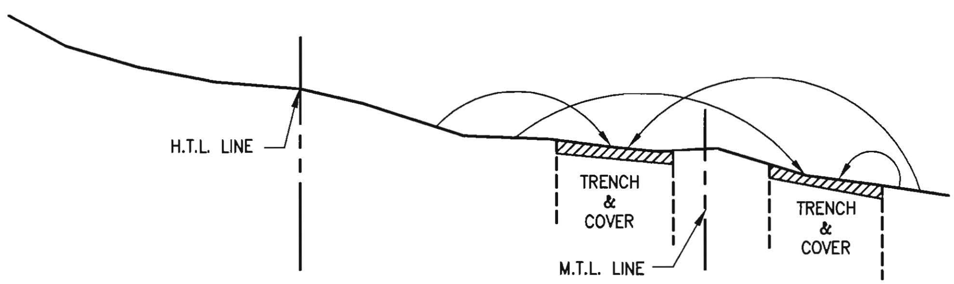
* RELOCATION OF SAND/SARGRASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L WITH SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO BEACH MAINTENANCE STORAGE AREA WITHIN FOREDUNES ABOVE H.T.L.

** ONCE THE SARGASSUM DECOMPOSES, IT IS REMOVED FROM THE BEACH MAINTENANCE STORAGE AREA AND PLACED IN THE SURF ZONE BELOW M.T.L.

1 (1 | 2,5,6) PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

OCT 30 2007



RELOCATION OF SAND/SARGASSUM FROM AREA OF THE BEACH LOCATED BETWEEN H.T.L TO BELOW M.T.L AND SUBSEQUENT PLACEMENT OF THIS MATERIAL INTO WINDROWS BOTH ABOVE AND BELOW M.T.L THE MATERIAL IS THEN PLACED IN A TRENCH AND BURIED.

1 (5 | 5) PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

PERMITTED PLANS

FOR COE USE ONLY

Permit Application No.: SWG-2007-1847

Applicant Name: City of Port Aransas

Sheet 7 of 8

APPLICANT: CITY OF PORT ARANSAS

PROJECT NAME: GULF BEACH CLEANING

COUNTY: NUECES

DATE: 06/07 | REV. DATE: 8-14-2007 | DATUM:

HDR | SHINER MOSELEY AND ASSOCIATES, INC.

555 N. Carancahua, Suite 1650
Corpus Christi, Texas 78478

PROJECT No: 66107 | SHEET 07 of 08

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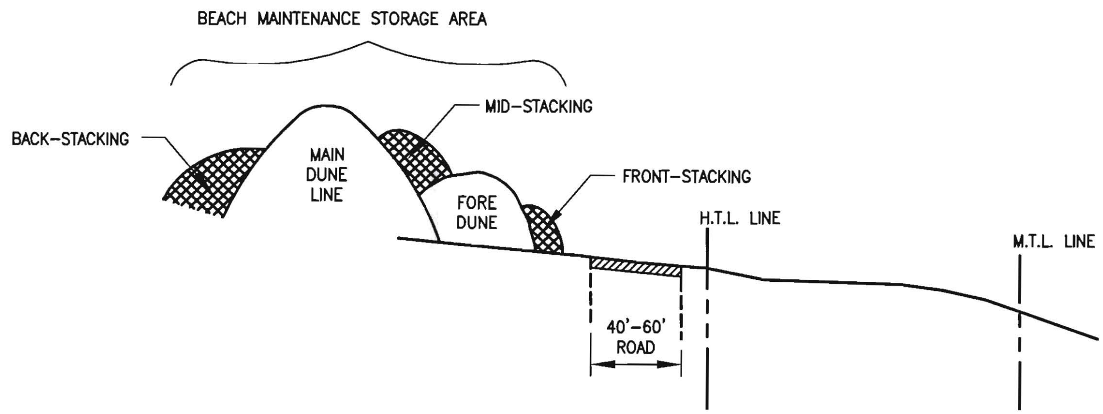
PROPOSED BEACH MAINTENANCE PRACTICES



1 | 1 2,5,6

PROPOSED MAINTENANCE – TYPICAL SECTION

SCALE: N.T.S.

ALTERNATE PLACEMENT AREAS

SAND/SARGASSUM IS PROPOSED TO BE PLACED IN THREE LOCATIONS WITHIN THE BEACH MAINTENANCE STORAGE AREA:

A. FRONT -STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM ABOVE H.T.L AT BASE OF FOREDUNE ON ACCRETING BEACHES ONLY.

B. MID-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM WITHIN TROUGHS BEHIND THE FOREDUNE ON ALL BEACHES.

C. BACK-STACKING OF SMALL PILES CONSISTING OF SAND/SARGASSUM IN BACK OF THE MAIN DUNE LINE ON ALL BEACHES.

FOR COE USE ONLY
Permit Application No.: SWG-2007-1847
Applicant Name: City of Port Aransas
Sheet 8 of 8

APPLICANT: CITY OF PORT ARANSAS			
PROJECT NAME: GULF BEACH CLEANING			
COUNTY: NUECES			
DATE: 06/07	REV. DATE: 8-14-2007	DATUM:	

HDR | SHINER MOSELEY AND ASSOCIATES, INC.
555 N. Carancahua, Suite 1650
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PROJECT No: 66107 | SHEET 08 of 08

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"ATTACHMENT A"

PROVISIONS FOR SEA TURTLE AND PIPING PLOVER MONITORING ON 7-MILE STRETCH OF BEACH WITHIN THE CITY OF PORT ARANSAS BEACH MAINTENANCE AREA

SEA TURTLES

Maintenance Activities

1. No maintenance equipment shall enter a work area until an initial survey has been performed and maintenance/equipment operators are notified that it is clear to proceed. The initial survey will be conducted in accordance with paragraphs 11, 12, 13 and 14 below.

2. If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the siting location, and a city staff member will immediately report the siting to the Sea Turtle Restoration Program.

3. Beach cleaning activities will not recommence within 100 feet of the nest site until a designee from the Sea Turtle Restoration Program of the Padre Island National Seashore (PAIS) has arrived on site and has given approval to do so. The City of Port Aransas (City) has stated that its staff will honor this commitment to cease maintenance activities within 100 feet of the nest site for a period no greater than 3 hours. If a designee from the Sea Turtle Restoration Program has not arrived on site within 3 hours of receiving the report from the City, the City has stated that its staff will flag the nest area and recommence work making sure that the nest site is avoided.

4. All ruts and berms created by city equipment engaged in beach maintenance activities will be smoothed out to no greater than 2 inches each day so that turtle tracks can be better identified and to prevent small turtles from becoming entrapped. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

5. Mechanical beach cleaning equipment shall attempt to limit penetration into the surface of the beach to depths of 2 inches (5.08 centimeters) to the extent practicable based on the limitations of the equipment. If beach maintenance activities results in ruts greater than 2 inches, City staff will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting is untested; the City commits to consideration of this practice and will test and implement it if found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time the practice is considered, tested and/or implemented.

6. If beach conditions allow, public driving lanes will be approximately 25 feet (7.62 meters) in width and located no closer than 50 feet (15.2 meters) from the MHT line and 25 feet (7.62 meters) from the base of the foredune.

7. If conditions necessitate front stacking of material, sand and sargassum will be placed on the foredune area adjacent to where it is removed. Sand and sargassum placement areas will have 10-20 foot (3.04-6.09 meters) gaps every 200 feet (60.9 meters) to allow turtles to traverse these areas.

8. The City will be allowed to build an approximately 20-foot wide berm in order to establish a safety lane for ingress and egress of emergency vehicles during the one week period in which Sandfest occurs each summer. The safety lane will be located between MHT and the annual high tide line, and any constructed berms will be smoothed out to a target height of 2 inches (5.08 centimeters) or less after the special event. Monitors will be preset in the area while work is being conducted. The same monitoring requirements for daily beach operations will also apply to the creation and smoothing of berms. If City staff members observe a turtle making its way onto the beach where berms are in place, they will attempt to create an unrestricted passage for the turtle by smoothing out the berm with a shovel or tool. As specified in other sections of this document, the proper authorities will be contacted immediately when the turtle is observed. During the Sandfest special event, City staff will also be permitted to bring large piles of sand for use during the sculpture building contest. The piles of sand, and the sculptures made from them, will be spaced so as to allow ample open beach for use by any nesting turtles. The sculptures and mounded sand will be smoothed out to a target height of 2 inches (5.08 centimeters) or less immediately after the event.

Education

9. The City will require all personnel involved in beach maintenance activities to receive training each year, prior to their involvement in cleaning activities. The scope of training will include: (1) Identification of different turtle species; (2) Recognition of turtle tracks; (3) Basic procedures for recording turtle information if turtle returns to the water prior to arrival of rescue team; (4) Protection of nest areas; (5) Contact information for different rescue agencies in the area. All turtles, turtle nests, or turtle eggs found by monitors or reported to beach maintenance personnel will be safe-guarded by City staff until they can be relocated by the appropriate authorities

   An annual refresher course is also required. In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with turtle training. This training will be also be arranged with a Service approved agency or facility prior to turtle nesting season.

   The City will provide a financial award to any City beach maintenance employee who successfully identifies a turtle nest.

10. The City will ensure that public education signs concerning turtles and their protection are posted at strategic locations within the project area. Signage content will be coordinated with the Sea Turtle Coordinator at PAIS.

Monitoring & Patrols

11. Prior to 1 March of each year, the City will submit an annual turtle monitoring plan to the Corps of Engineers Corpus Christi Regulatory Field Office (CCRFO) for approval. This plan shall contain information on how the City will ensure compliance with the conservation measures for sea turtles as defined in this section. In addition, an annual follow-up report will be presented to the CCRFO prior to February 1 of each year containing a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species and a summary of measures implemented during project activities, relative success of those measures and any recommendations for improvement to the measures.

12. The City will ensure that daily patrols are carried out from 15 March to 1 October for the entire 7-mile stretch of beach within the project area, beginning at sunrise and ending at 6:30 pm. The City will provide a trained certified turtle patroller or supervisor on-site to accompany equipment from March 15 to July 30.

Notification

13. If a turtle or a turtle nest is located beach cleaning activities will immediately cease within 100 ft. of the siting location, and a city staff member will immediately report the siting to the Sea Turtle Restoration Program.

14. In the event a take occurs, the City will immediately notify both the USACE Corpus Christi Regulatory Office and the U.S. Fish & Wildlife Service Corpus Christi Field Office (Service).

PIPING PLOVER

1. The City will arrange a yearly training course with a Service approved agency or facility (PAIS, UTMSI (University of Texas Marine Science Institute), Service). The scope of training will include: (1) Identification of piping plovers; (2) Recognition of habitat; (3) Basic procedures for recording piping plover information; (4) Contact information for different rescue agencies in the area. In addition to annual refresher training for existing beach maintenance staff, the City will provide new hires with piping plover training. This training will also be arranged with either a PAIS or UTMSI representative, or the Service.

2. A habitat monitoring effort for various maintained areas of beach located within the City's beach maintenance area and a control area will be undertaken in order to allow the City to conduct beach maintenance activities as authorized by the Corps of Engineers permit, to monitor the effects of beach maintenance activities on piping plovers and their

habitat, and to make determinations about potential adjustments to beach maintenance activities in an adaptive fashion on an as-needed basis (See Attachment B). Parameters to be assessed are beach width, beach/dune topography, sargassum amounts, and bird use with reference to regulated beach maintenance activities. Results of the habitat monitoring effort will be provided in an annual report to USACE by February 1 of each year for a period of 5 years.

ATTACHMENT B

Habitat Monitoring Effort
City of Port Aransas
Beach Maintenance Permit Application
USACE Permit Application # SWG-2007-1847

Prepared By:

HDR ENGNEERING, INC.

Prepared For:
City of Port Aransas

City Job # 66107

October 2008 (Rev. Feb. 2009)

TABLE OF CONTENTS

INTRODUCTION

The purpose of this document is to provide a habitat monitoring effort for 3 different maintained areas of recreational beach (Priority Areas A, B, and C) within 7 mile area on the northern end of Mustang Island, from the southern city limit of Port Aransas city limits north to Lantana Drive, Nueces County, TX. A control area of beach will also be monitored. This monitoring effort is intended to accomplish the following:

- Allow the City to conduct beach maintenance activities as authorized by the USACE permit;
- Monitor the effects of beach maintenance activities on piping plovers and their habitat;
- Make determinations about the need for potential adjustments to beach maintenance activities in an adaptive fashion.

This effort is a requirement of the USACE permit and has been coordinated with the U.S. Fish and Wildlife Service (USFWS) as part of the Section 7 Endangered Species Formal Consultation process.

In order to summarize sea turtle nesting activity within the City's beach maintenance area, an annual report will be submitted to USACE, under separate cover, by February 1 of each year. As outlined in conservation measures provided in the Biological Assessment for this project, the report will contain a summary of the number of turtles and/or nests found that year by species, a map depicting the location of each nest, and the number of takes, if any, by species.

PROJECT BACKGROUND

As part of the USFWS Section 7 Endangered Species informal and formal consultation processes, USACE Galveston District personnel and the applicant met with the USFWS, had telephone communication with the National Marine Fisheries Service (NMFS), and researched literature concerning mechanical maintenance of Gulf of Mexico beaches and the potential effect on endangered species. Of the 13 species identified during the consultation processes, possible impacts to the piping plover (*Charadrius melodus*) and five species of turtle (Kemps ridley (*Lepidochelys kempii*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*) were identified to possibly occur as a result of this project.

DESCRIPTION OF THE PROPOSED BEACH MAINTENANCE PROJECT

Beach maintenance is proposed for 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive, Nueces County, TX. If authorized, the proposed activities would be

permitted for a period of five years, after which a request for an extension would be required to continue permitted activities.

The proposed action involves the City of Port Aransas (City) conducting the following beach maintenance activities:

A. Removal of all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill
B. Relocation of sand/sargassum from areas of the beach located between the annual high tide line (HTL) to below the mean high tide line (MTL) to beach maintenance storage areas located above HTL
C. Burial of decomposing seaweed on the beach above the mean high tide **only during periods when there is an abundance of material in the dunes*
D. Repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between HTL and MTL in order to maintain clear driving lanes along the beach for public access.

PROPOSED EQUIPMENT FOR BEACH MAINTENANCE

The following type of equipment is utilized by the City of Port Aransas as part of beach maintenance activities:

- **Articulated Front-end Loaders** – This machinery is typically used to skim sargassum and a small amount of sand from between HTL to below MTL with subsequent placement of this material into TGLO beach maintenance storage areas located above HTL. This equipment is utilized in Priority Areas A, B, and C during heavy sargassum season (April-August). When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Articulated front-end loaders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Graders** – The motor grader has a 10-14 inch blade that scrapes sargassum and sand into a windrow. These windrows are created both above and below MTL. The blade is then used to dig a trench and the sargassum windrow is then pushed into the trench and buried. The motor grader can also be used to level the beach from below MTL to above HTL and to level the travel way in the road way area. This equipment is utilized in Priority Areas A, B, and C. Motor graders have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Motor Grader with Rake** – This piece of machinery includes a motor grader affixed with a finger rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of

sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Motor graders with rakes have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Dump Trucks** – Dump trucks are typically used in Priority Areas A, B, and C to haul large amounts of sargassum from the beach to approved upland storage locations within the beach dune system.

- **Pick-up Trucks-** Pick-up trucks are used to carry City beach maintenance staff to different locations on the beach where beach maintenance activities are taking place. In addition, trucks can be used to remove large pieces of trash such as lumber. Pick-up trucks are utilized in Priority Areas A, B, and C.

- **Tractor with Rake Attachment -** This piece of machinery includes a tractor affixed with a rake that is used to remove sargassum from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. When placing sargassum at the foredune, the City will place piles of sargassum 10-20 feet apart in order to minimize the potential of turtle nests being covered by sargassum piles and reduce fire ant infestation. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Tractor with Surf Rake** – This piece of machinery is utilized to remove very small debris, seaweed, etc. from below MTL to above HTL. This equipment is utilized in Priority Areas A, B, and C. Tractors with rake attachments have adjustable blades which will prevent the blades from going more than 2 inches into the sand.

- **Garbage Trucks** – Garbage trucks are typically used in Priority Areas A, B, and C to transport garbage and debris from designated trash receptacles along the beach to the City's sanitary landfill. In addition, garbage trucks are used to remove all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach for disposal in the City's sanitary landfill.

If beach maintenance activities result in ruts greater than two inches deep, the City will explore the possibility of retrofitting tires on existing equipment or of using multiple pieces of equipment in tandem in order to attain this target. The practice of retrofitting tires so that they are inflated to no greater than 10 PSI in order to reduce or eliminate rutting has not been implemented in Texas; therefore the City commits to consideration of this practice and will test and implement if it is found to be practicable and effective. The results of inflating tires to no greater than 10 PSI will be monitored and reported at such time it is considered, tested and/or implemented. If ruts are to be smoothed with the use of a backhoe or tractor, a monitor will check for nesting turtles or tracks prior to smoothing the area.

SCHEDULE OF BEACH MAINTENANCE WORK

Beach maintenance practices are typically seasonal (April-August) but are performed at other times of the year if conditions merit. For example, sargassum beach cleaning practices have historically been used as late as October when tropical storm or hurricane activity washed ashore large volumes of vegetative material. Roadway maintenance is performed year round; the frequency of roadway maintenance is dictated by roadway use and environmental condition. For example, maintenance is typically required after damaging high water events.

Most beach maintenance activities will take place between the hours of 7:00 am and 3:30 pm. The length of beach to be cleaned, the methods employed, and the duration of maintenance activities on a given day will vary with beach conditions and staff availability. The City has a three-tiered system to determine which areas of the 7-mile stretch of beach will be cleaned and in what order and has identified three priority areas for beach maintenance:

1. **Priority Area A -** High use areas, including those portions of beach located between Lantana Drive and Beach Access Road 1A. Priority A areas are cleaned and maintained daily, first thing in the morning (6:30 am) so that they will be clear of sargassum and debris prior to heavy pedestrian usage and vehicular traffic. Ground trash is handpicked from Priority A areas every day. Prior to commencing work, these areas will be surveyed by a turtle monitor.

2. **Priority Area B -** Semi-heavily used areas, including those portions of beach located between Beach Access Road 1A to Beach Access Road 1. Priority B areas are cleaned and maintained daily after Priority A areas from late-morning to mid-afternoon. Ground trash is handpicked from Priority B areas every day.

3. **Priority Area C -** Low use areas, including those portions of beach located between Beach Access Road 1 and the southern end of the City of Port Aransas city limits. Priority C areas are cleaned and maintained two times a week since pedestrian and vehicular traffic is lower than in Priority areas A & B. Ground trash is handpicked from Priority C areas every day.

HABITAT MONITORING EFFORT

BACKGROUND

On May 20, 2008, the USFWS proposed the re-designation of approximately 150,000 acres of critical habitat for the endangered piping plover. A majority of the City's beach maintenance project area will be re-designated as critical habitat and therefore will require special management consideration and protection. The proposed re-designation of critical habitat prompted USACE to request that a habitat monitoring effort be developed for the entire 7-mile stretch of beach maintained by the City. The desired outcome of the effort is to identify the most cost-effective ways to maintain the beach while conserving wildlife habitat and maximizing visitor satisfaction. To this end, the following habitat monitoring effort has been developed:

MEANS AND METHODS

As previously stated, the City has a three-tiered priority system (Priority Area A, B, and C) for selecting which areas of beach to clean first and in what order. For the purposes of the habitat monitoring effort, an approximate 200 ft. long survey area within each priority area and within one control area will be monitored for the following parameters:

1. Beach Width
2. Beach Topography
3. Sargassum Amounts
4. Bird Use

Each 200 ft. long survey area will be observed for the above parameters from the Mean High Tide (MHT) line to the base of the foredune. Each of these parameters will be measured on a quarterly basis (once during the periods of January-March, April-June, July-September, and October-December) each year for a period of 5 years. The 200 ft. long survey areas for Priority Areas A, B, and C and the control area will be located within the following locations:

Priority Area A – 200 ft. survey area located between Lantana Drive to the north and Access Road 1A to the south

Priority Area B – 200 ft. survey area located between Access Road 1A to and Access Road 1

Priority Area C – 200 ft. survey area located between Access Road 1 and the Port Aransas city limit

Control Area – 200 ft. survey area beginning at marker 50 and heading south toward marker 51.

The following is a description of how each parameter will be measured:

1. Beach Width – The width of beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Global Positioning System (GPS) equipment will be used on each transect to record the locations MHT and the toe of the dune. The distance between these two locations will be considered the beach width for each respective transect. Beach widths will be measured in February, May, August, and November. This information will be included in the annual report.

2. Beach/Dune Topography – Topography of the beach in Priority Areas A, B, and C and the control area will be measured along transects located every 50 ft. for a total of 200 ft. Survey equipment and tide gauge data will be used to identify elevations for the edge of water, MHT, the annual high tide line, the toe of the foredune, and the top of the foredune. This data will provide for a continuous beach profile within the 200 ft. survey area. The vertical datum for these elevations will be provided in NAVD 88.

3. Sargassum Amounts - Amounts of sargassum will be recorded for each 200 ft. survey area by observing 5 random 1 meter square quadrats taken down the rack line where sargassum is present. Sargassum amounts will be generally classified as "Excessive", "Moderate", "Minimal", or "Absent". Different sargassum amounts will be documented via photographs in order to establish baselines for the qualifiers "excessive", "moderate", "minimal", and "absent". In general, excessive amounts will be described as having sargassum deposits between 6-8 inches thick and with greater than 80% coverage of beach. Moderate amounts will be described as having deposits between 4-6 inches thick and with greater than 60 % coverage of beach. Minimal amounts will be described as having deposits between 0-4 inches thick and with greater than 40% coverage of beach. Absent areas will be described as having no sargassum deposits.

4. Bird Use – Bird use will be recorded based on initial observations of birds within each 200 ft. long survey area. The number of birds, species types, behavior, and location within the 200 ft. survey area will be recorded.

Benthic data will not be collected or analyzed as part of this effort due to excess costs and inability to collect meaningful data without a large sample size. Data collected on beach width, topography, sargassum amounts, and bird use will allow for a comparison of maintained and unmaintained sections of beach. Due to limited resources, observations made during this effort may not be attributed to the presence or absence of beach maintenance.

REPORTING RESULTS

The City's consultant will compare data from Priority Areas A, B, and C and the control area and report on observations. Results of the above habitat monitoring study will be provided in an annual report to USACE prior to February 1 of each year for a period of 5 years. Additionally, if equipment tires are retrofitted tires so that they are inflated to no greater than 10 PSI in an attempt to reduce or eliminate rutting, the results will be monitored and reported.

SEP 0 8 2009

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 4, 2009

Mr. John Wong
U.S. Army Corps of Engineers
Corpus Christi Regulatory Field Office
CESWG-PE-RCC
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

Re: USACE Permit Application Number SWG-2007-01847

Dear Mr. Wong:

This letter is in response to the Statement of Findings (SOF) dated August 24, 2009, for the Joint Public Notice dated November 30, 2007, on the City of Port Aransas proposed beach maintenance within 7 miles of recreational beach on the northern end of Mustang Island, from the southern end of the City of Port Aransas city limits north to Lantana Drive at the Horace Caldwell Pier, Nueces County, Texas.

The Texas Commission on Environmental Quality (TCEQ) has reviewed the public notice and related application information along with the SOF. On behalf of the Executive Director and based on our evaluation of the information contained in these documents, the TCEQ certifies that there is reasonable assurance that the project will be conducted in a way that will not violate water quality standards.

The beach maintenance will include (a) removing all non-natural material such as lumber, plastic, bottles, cans, etc. from the beach and disposing them in a sanitary landfill, (b) relocation of sand/sargassum from the beach area located between the annual high tide line (HTL) and below the mean high tide line (MTL) to beach maintenance storage areas located above the HTL, (c) the subsequent placement (non-burial) of decomposed sargassum to areas at or below the MTL, (d) burial of decomposing seaweed on the beach above the mean high tide only during periods when there is an abundance of material in the dunes, (e) repositioning of sand from the toe of the dune or other areas above the annual HTL to areas on the beach between MHT and the HTL in order to maintain clear driving lanes along the beach for public access, and building of an approximately 20-foot-wide berm in order to establish a safety lane located between MHT and the HTL for ingress and egress of emergency vehicles during the one week period in which the Sandfest Festival occurs each summer.

SEP 0 8 2009

Mr. John Wong
U.S. Army Corps of Engineers
USACE Permit Application Number SWG-2007-01847
Page 2
September 4, 2009

The TCEQ has reviewed this proposed action for consistency with the Texas Coastal Management Program (CMP) goals and policies in accordance with the regulations of the Coastal Coordination Council and has determined that the proposed action is consistent with the applicable CMP goals and policies.

This certification was reviewed for consistency with the CMP's development in critical areas policy {Title 31, Texas Administrative Code (TAC), Chapter (§) 501.23} and dredging and dredged material disposal and placement policy {31 TAC §501.25}. This certification complies with the CMP goals {31 TAC §501.12(1, 2, 3, 5)} applicable to these policies.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

If you require additional information or further assistance, please contact Ms. Lili Murphy, Water Quality Assessment Section, Water Quality Division (MC-150), at (512) 239-4596.

Sincerely,

For L'Oreal Stepney

L'Oreal W. Stepney, P.E., Assistant Deputy Director
Office of Permitting and Registration
Texas Commission on Environmental Quality

LWS/LM/sp

Attachment

ccs: City of Port Aransas, 1201 Leopard Street, Corpus Christi, Texas 78401
Mr. Ben Rhame, Secretary, Coastal Coordination Council, P.O. Box 12873, Austin, Texas 78711-2873

SEP 0 8 2009

WORK DESCRIPTION: As described in the public notice dated November 30, 2007, and the August 24, 2009 Environmental Assessment and Statement of Findings.

SPECIAL CONDITIONS: None

GENERAL: **This certification, issued pursuant to the requirements of Title 30, Texas Administrative Code, Chapter 279, is restricted to the work described in the [Enter date of the SOF], Environmental Assessment and Statement of Findings and shall be concurrent with the Corps of Engineers (COE) permit.** This certification may be extended to any minor revision of the COE permit when such change(s) would not result in an impact on water quality. The Texas Commission on Environmental Quality (TCEQ) reserves the right to require full joint public notice on a request for minor revision. The applicant is hereby placed on notice that any activity conducted pursuant to the COE permit which results in a violation of the state's surface water quality standards may result in an enforcement proceeding being initiated by the TCEQ or a successor agency.

STANDARD PROVISIONS: These following provisions attach to any permit issued by the COE and shall be followed by the permittee or any employee, agent, contractor, or subcontractor of the permittee during any phase of work authorized by a COE permit.

1. The water quality of wetlands shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, and Numerical Criteria.

2. The applicant shall not engage in any activity which will cause surface waters to be toxic to man, aquatic life, or terrestrial life.

3. Permittee shall employ measures to control spills of fuels, lubricants, or any other materials to prevent them from entering a watercourse. All spills shall be promptly reported to the TCEQ by calling the State of Texas Environmental Hotline at 1-800-832-8224.

4. Sanitary wastes shall be retained for disposal in some legal manner. Marinas and similar operations which harbor boats equipped with marine sanitation devices shall provide state/federal permitted treatment facilities or pump out facilities for ultimate transfer to a permitted treatment facility. Additionally, marinas shall display signs in appropriate locations advising boat owners that the discharge of sewage from a marine sanitation device to waters in the state is a violation of state and federal law.

5. Materials resulting from the destruction of existing structures shall be removed from the water or areas adjacent to the water and disposed of in some legal manner.

6. A discharge shall not cause substantial and persistent changes from ambient conditions of turbidity or color. The use of silt screens or other appropriate methods is encouraged to confine suspended particulates.

7. The placement of any material in a watercourse or wetlands shall be avoided and placed there only with the approval of the Corps when no other reasonable alternative is available. If work within a wetland is unavoidable, gouging or rutting of the substrate is prohibited. Heavy equipment shall be placed on mats to protect the substrate from gouging and rutting if necessary.

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8. Dredged Material Placement: Dredged sediments shall be placed in such a manner as to prevent any sediment runoff onto any adjacent property not owned by the applicant. Liquid runoff from the disposal area shall be retained on-site or shall be filtered and returned to the watercourse from which the dredged materials were removed. Except for material placement authorized by this permit, sediments from the project shall be placed in such a manner as to prevent any sediment runoff into waters in the state, including wetlands.

9. If contaminated spoil that was not anticipated or provided for in the permit application is encountered during dredging, dredging operations shall be immediately terminated and the TCEQ shall be contacted by calling the State of Texas Environmental Hotline at 1-800-832-8224. Dredging activities shall not be resumed until authorized by the Commission.

10. Contaminated water, soil, or any other material shall not be allowed to enter a watercourse. Noncontaminated stormwater from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.

11. Storm water runoff from construction activities that result in a disturbance of one or more acres, or are a part of a common plan of development that will result in the disturbance of one or more acres, must be controlled and authorized under Texas Pollutant Discharge Elimination System (TPDES) general permit TXR150000. A copy of the general permit, application (notice of intent), and additional information is available at: http://www.tceq.state.tx.us/nav/permits/wq_construction.html or by contacting the TCEQ Storm Water & Pretreatment Team at (512) 239-4671.

12. Upon completion of earthwork operations, all temporary fills shall be removed from the watercourse/wetland, and areas disturbed during construction shall be seeded, riprapped, or given some other type of protection to minimize subsequent soil erosion. Any fill material shall be clean and of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters.

13. Disturbance to vegetation will be limited to only what is absolutely necessary. After construction, all disturbed areas will be revegetated to approximate the pre-disturbance native plant assemblage.

14. Where the control of weeds, insects, and other undesirable species is deemed necessary by the permittee, control methods which are nontoxic to aquatic life or human health shall be employed when the activity is located in or in close proximity to water, including wetlands.

15. Concentrations of taste and odor producing substances shall not interfere with the production of potable water by reasonable water treatment methods, impart unpalatable flavor to food fish including shellfish, result in offensive odors arising from the water, or otherwise interfere with reasonable use of the water in the state.

16. Surface water shall be essentially free of floating debris and suspended solids that are conducive to producing adverse responses in aquatic organisms, putrescible sludge deposits, or sediment layers which adversely affect benthic biota or any lawful uses.

17. Surface waters shall be essentially free of settleable solids conducive to changes in flow characteristics of stream channels or the untimely filling of reservoirs, lakes, and bays.

18. The work of the applicant shall be conducted such that surface waters are maintained in an aesthetically attractive condition and foaming or frothing of a persistent nature is avoided. Surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse.

19. This certification shall not be deemed as fulfilling the applicant's/permittee's responsibility to obtain additional authorization/approval from other local, state, or federal regulatory agencies having special/specific authority to preserve and/or protect resources within the area where the work will occur.

Wong, John E SWG

From: Pollack, Jeffrey [Jeffrey.Pollack@hdrinc.com]
Sent: Friday, September 25, 2009 11:51 AM
To: Wong, John E SWG
Cc: David Parsons
Subject: Port Aransas bch monitoring

John,

I have confirmed with David Parsons that the City of Port A has no routine beach maintenance planned for the fall and winter. The City may engage in occasional, very infrequent, location-specific maintenance as conditions require, but regularly scheduled maintenance won't resume until early spring. As such, based on your input during our phone conversation on 9/25, we will define our scope of work to conduct beach monitoring (of beach width, topography, sargassum, and bird use, as specified in the habitat Monitoring Effort guidance (attachment B of the permit)), beginning in earnest in February, 2010. Since the permit specifies that a report of the results of this monitoring effort are due to the USACE by February 1 of each year for 5 years, this will allow us to collect a full year's worth of data for inclusion in the 2011 report.

The City recognizes that if routine maintenance activities are instated this fall or winter, plover monitoring and habitat monitoring would also have to be initiated.

Thanks again for your help here, John.

Best,

Jeff

Jeffrey Pollack, LEED AP

Environmental Scientist & Sustainability Specialist

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