Darrell Echols
06/28/02 08:11 AM
CDT

To: Arlene Wimer/PAIS/NPS@NPS
cc:
Subject: Re: BA for Lemon/Lemon Seed EA

----- Forwarded by Darrell Echols/PAIS/NPS on 06/28/02 08:11 AM -----

Loyal Mehrhoff
06/25/02 04:32 PM
MDT

To: Linda Dansby/SANTAFE/NPS@NPS, Darrell Echols/PAIS/NPS@NPS
cc: Peter Dratch/FTCOLLINS/NPS@NPS
Subject: Re: BA for Lemon/Lemon Seed EA

Darrell and Linda,

Some comments on your BA:

1. Names and titles for Peter and I:
Peter Dratch, Endangered Species Specialist, Biological Resource Management Division, NPS
Loyal Mehrhoff, Endangered Species Program Manager, Biological Resource Management Division, NPS

2. You only need to discuss species that are federally listed or federally proposed. The other species should be deleted from the BA (though you may want to retain them in the EA).

3. Cumulative effects are not really discussed by this BA. I do not know if this will be a problem for FWS.

4. You might want to consider a table with species, baseline, and the bottom line effects predicted for the project.

Let us know what FWS says about your new BA. If they still have problems with it, let us know and we will help get it fixed up (if you want the help). There is no need for you to keep bringing them a different colored rock hoping it is the correct color. We can help do that.

Loyal

++++++++++++++++++++++++++++
From the desk of:
Loyal A. Mehrhoff
Endangered Species Program Manager
National Park Service
1201 Oak Ridge Drive, Suite 200
Fort Collins, CO 80525

Phone: 970-225-3521
Fax: 970-225-3585
email: Loyal_Mehrhoff@nps.gov

NPS DOCUMENT # 582

Darrell Echols
06/28/02 08:11 AM
CDT

To: Arlene Wimer/PAIS/NPS@NPS
cc:
Subject: Re: BA for the Lemon/Lemon seed wells at Padre Island

----- Forwarded by Darrell Echols/PAIS/NPS on 06/28/02 08:11 AM -----

Peter Dratch
06/27/02 02:12 PM
MDT

To: Darrell Echols/PAIS/NPS
cc: Loyal_Mehrhoff@nps.gov
Subject: Re: BA for the Lemon/Lemon seed wells at Padre Island

Darrell,

I have some edits for the BA but have been unable to attach them from California. My understanding from talking with Arlene is that you are currently awaiting for a concurrance letter from FWS. If you don't get it, and Ms Orms explains why, I will be in the office all next week to work with you on any modifications. If there is something more pressing, I left phone numbers where I can be reached with Arlene.

Generally it looks like a thorough job. I hope the FWS sees it that way.

Peter

Peter A. Dratch, PhD
National Park Service
Biological Resources Management Division
1201 Oakridge Drive # 200
Fort Collins, CO 80525
Phone: 970/225-3596

-----Darrell Echols/PAIS/NPS wrote: -----

To: Peter Dratch/FTCOLLINS/NPS@NPS, Loyal Mehrhoff/FTCOLLINS/NPS@NPS, Linda Dansby/SANTAFE/NPS@NPS
From: Darrell Echols/PAIS/NPS
Date: 06/11/2002 03:11PM
cc: Arlene Wimer/PAIS/NPS@NPS
Subject: BA for the Lemon/Lemon seed wells at Padre Island

Folks,

Here is the BA that the park has re-written for the Lemon/Lemon seed wells at Padre Island National Seashore. This is a substantial re-write of the original BA but it was written based on requirements provided to us by Mary Orms of the local Fish and Wildlife office. The requirements that she provided were very vague and little guidance was given. Therefore, we have tried to anticipate what she wanted and have probably included more information than you may have seen in other BA's in the service. We have sent this to her today but would like any comments you may have on the document for us to include in future BA's. Feel free to call me if you have any questions.

Thanks,
Darrell



Final BA for Lemon wells.d

NPS DOCUMENT # 582

PADRE ISLAND NATIONAL SEASHORE
NATIONAL PARK SERVICE
SECTION 7, BIOLOGICAL ASSESSMENT

__X__ **INFORMAL**

_____ **FORMAL**

1. **REGIONAL AREA:** Intermountain Region, National Park Service

2. **PARK:** Padre Island National Seashore **REF:** PAIS-02-002

3. **LOCATION**: Southwest Cluster, Kenedy County, Texas

4. **ACTION PLANNED:** Approval of a Plan of Operations by BNP Petroleum Corporation (BNP) for the proposed Lemon/Lemon Seed Unit Wells No. 1-1000S and No. 1-1008S.

5. **PURPOSE AND NEED:**
Padre Island National Seashore was established by Congress on September 28, 1962 (16 U.S.C. §459d, *et seq.*), "In order to save and preserve, for purposes of public recreation, benefit, and inspiration, a portion of the diminishing seashore of the United States that remains undeveloped..."

At the time of the park's establishment, surface ownership was held by the State of Texas or by private landowners. In 1973, the surface estate owned by the State of Texas was conveyed to the U.S. Government, while those surface rights held by private landowners were acquired by the federal government through condemnation. All subsurface mineral interests underlying the park were retained by private owners. Those underlying the submerged lands under the Laguna Madre and Gulf of Mexico were retained by the State of Texas and are administered by the Texas General Land Office. Thus, the federal government does not own any of the subsurface oil and gas rights in the park. However, Congress directed in the park's enabling act that nonfederal oil and gas development be regulated.

Also, pursuant to its authority at 16 U.S.C. §3 and several other park enabling statutes, the NPS promulgated regulations at 36 CFR Part 9, Subpart B ("9B Regulations') to provide a systemwide regulatory scheme governing the exercise of nonfederal oil and gas rights. The purposes of the regulations are to "insure that activities undertaken pursuant to [nonfederal oil and gas rights] are conducted in a manner consistent with the purposes for which the National Park System and each unit thereof were created, to prevent or minimize damage to the environment and other resource values, and to insure to the extent feasible that all units of the National Park System are left unimpaired for the enjoyment of future generations." [36 CFR § 9.30]

NPS DOCUMENT# 582

The 9B regulations fall within the broad scope of authority granted to the NPS from Congress under the NPS Organic Act - authority that includes the power to regulate conduct that occurs on or off federal land, which may affect federal lands. The regulations are designed to control conduct associated with private mineral rights on federal land to avoid or minimize harm to park resources and values. Thus, the United States need not own the mineral interest beneath Padre Island National Seashore to regulate rights associated with that interest that may affect the federally owned surface.

Based on 9B regulations and the park's enabling legislation, nonfederal oil and gas operations can only be conducted in accordance with an approved plan of operations. A plan of operations outlines the process, precautions, and regulatory requirements that will be utilized or adhered to by a specific oil and gas operator and must be approved through the National Environmental Policy Act process.

Padre Island National Seashore is therefore considering the submittal of a Plan of Operations by BNP Petroleum Corporation (BNP) for the proposed Lemon/Lemon Seed Unit Wells No. 1-1000S and No. 1-1008S. The proposed location of this operation is 12.5 miles south of the end of Park Road 22, and approximately 900 feet inland from the Gulf of Mexico within Padre Island National Seashore (Figure 1). This operation will involve the development of an access road, construction of a well pad, establishment of a water well, establishment of two gas wells, and the creation of a production facility with its associated flow line if one or both wells are productive.

7. PROJECT TEAM AND CONSULTANTS:

Jock F. Whitworth	Superintendent, Padre Island National Seashore, TX
Dr. Peter Dratch	Chief, NPS Biological Resources Division, CO
Dr. Loyal Mierhoff	Mierhoff National Endangered Species Coordinator, NPS Biological Resources Division, CO / Management
Ken McMullen	Chief, Resources Management Division, Padre Island National Seashore, TX
Arlene Wimer	Environmental Protection Specialist, Padre Island National Seashore, TX
Darrell Echols	Resources Management Specialist, Padre Island National Seashore, TX
Dr. Donna Shaver	Station Leader, Padre Island Field Research Station, U.S. Geological Survey, TX
Karen Swallow	Endangered Species Coordinator, U.S. Fish and Wildlife Service, LA
Jody Mays	Biological Technician, Padre Island National Seashore, TX
Kathryn Morris	Biological Technician, Padre Island National Seashore, TX
John Eckrote	Biological Technician, Padre Island National Seashore, TX
Brianna Young	Biological Technician, Padre Island National Seashore, TX
Dimitra Guerrero	Biological Technician, Padre Island National Seashore, TX
James Wearden	Biological Technician, Padre Island National Seashore, TX

NPS DOCUMENT #: 582



Figure 1. Project Location.

NPS DOCUMENT-# 582

8. PROJECT OBJECTIVE:

The project's objective is to approve BNP Petroleum Corporation's Plan of Operations for the proposed Lemon/Lemon Seed Unit Wells No. 1-1000S and No. 1-1008S while ensuring the park's values and purposes, natural and cultural resources, and visitor experience are protected.

9. DESCRIPTION OF THE PROPOSED ACTION:

Access Road

A conventional unpaved road and foundation will be constructed using techniques common to south Texas oil industry. First step is to construct the access road through the dunes from the Gulf shoreline to the well site. Removing vegetation and leveling of the pad site and placement of the liner is the next step, followed by laying down road fabric, delivering caliche material, compacting the material, and establishing the drilling pad and water well locations. Length of the access road will be 1000 linear feet at a width of 18 feet, berm to berm. Total expected area of impact of the access road is 18,000 square feet (0.41 ac.). The opening in the dunes resulting from road construction will be oriented southeast to northwest to allow the predominant winds to assist in keeping the pass open and minimizing road maintenance requirements. If production of the well is initiated a gate will be installed to reduce use by non-authorized persons.

Access to the park will be on paved Park Road 22 through the park to the Gulf shoreline. Once on the beach, the proposal is to use the beach as the main access route to the drilling site 12.5 miles down the shoreline.

Well Pad Construction and Drilling

The well pad will be polygon-shaped and encompass 136,603 sq. ft. (3.6 ac.) of upland habitat. The drill pad will be constructed of caliche with a 3-foot berm around its periphery. The entire pad will be placed on top of a 20-mm polyethylene protective liner. This project will require two wells to be drilled from this location using a diesel- electric drilling rig. Other wells may be drilled from this pad if additional unexplored gas reserves are sought. All equipment associated with drilling and production operations will be contained within this pad. During active drilling, equipment will include the drilling rig, water tanks, mud system, heliport, offices, employee quarters, portable restroom facilities, and fuel tanks. If the well becomes productive, the pad will be reduced in size and all drilling equipment will be removed. This pad will also include a 100-ft. by 200-ft. lined, open area, where storage containers used to hold the sands, silts, clays, and other geologic materials removed during the drilling process will be stored for one to three days. A temporary barbed-wire fence will be constructed around the pad location. For a list of facilities associated with this project, please review the BNP Plan of Operations provided to your agency along with this request.

Water Well Development

A temporary water well located on the drill pad will be drilled to provide a source of water for the drilling operation. This well will provide 1,302,000 gallons of water from the Goliad geologic formation located at a depth between 1,400 and 1,700 feet. This water well will be similar to the water well drilled during the Dunn-Murdock #1 operation at

NPS DOCUMENT# 582

Yarborough Pass in March 2002. Plans are to plug and abandon this well at cessation of the drilling operation, during the reclamation phase.

Production Facilities

If BNP's proposed wells prove to be productive, a production facility will be placed on the existing well pad. The pad size will be reduced from 136,603 sq. ft. (3.6 ac.) to 69,300 (1.6 ac.), approximately half of the pads original size. Equipment necessary for a production facility includes a heliport for emergency use only, storage tanks, compressors, meter runs, dehydrators, heaters, and other equipment. Caliche, lined berms will be constructed around all storage containers to create a protective secondary containment area large enough to contain 1.5 times the volume of the largest tank. A permanent chain link fence and gate will be constructed around the facility replacing the temporary barbed-wire fence, and all facilities will be painted a "sand " color chosen by the NPS to reduce visual intrusions.

Associated Flow Line

Contingent upon the production rates of the well(s), a flow line ranging from a minimum of three to a maximum of ten inches in diameter will be installed and connected to the existing AEP (formerly Enron/HPL) delivery pipeline. The selection of AEP is because their delivery pipeline is under an existing approved plan of operations and in compliance with park policy and Federal and State regulations. Up to 50-foot wide corridor will be established for the flow line route through hummocky upland habitat sites, while in the more sensitive wetland area only a 25-foot corridor is permitted. This corridor will be maintained to allow for construction and maintenance activities associated with the flow line over the long-term.

10. ALTERNATIVE LOCATIONS AND DISCUSSION:

During the scoping process for this project, alternative locations and methods were considered for siting the proposed well pad, access road, ~~production facilities, and flow line in consultation~~ with the USFWS, BNP, park staff, Regional Support Office, and Denver Support Office for technical guidance. For the reasons described below, these ~~alternatives were not~~ subjected to further analysis:

Northern Alternative: A surface location approximately 1,500 ft. north of the proposed Lemon/Lemon Seed location was considered. The access road to this location would be approximately 1,800 linear feet and as wide as 22 feet due to the steepness of the dune system and requirements for slope stabilization and re-vegetation. This road would impact 1,010 linear ft. more of dunes and grasslands than the presently proposed access road. This alternative location would allow only one gas formation to be targeted because of the drilling angle, and would ultimately require additional well pad locations and associated access roads to be constructed in another area to hit the presently proposed targets.

Based on the greater impacts to park wildlife habitat and dune system, the increased need for more access routes through the dunes, the increased economic costs from construction, well pad development, access, and the likelihood of missing targeted

NPS DOCUMENT# 582

multiple gas formations, and the decrease in benefits to Padre Island NS resources of this action, this Northern alternative was dismissed.

Southern Alternative: Another surface location approximately 3,000 ft. south of the proposed Lemon/Lemon Seed location was considered. During the field visit to the site, it was felt that the impacts associated with this location would be similar to the other alternative locations, but would have a greater impact on the dune system than either the Northern alternative or the proposed Lemon/Lemon seed location. The dunes in this location were formed in two separate rows and extended a greater distance back from the shoreline. Reclamation and stabilization of this site would have been more difficult. The length of the access road associated with this alternative would be longer, with a width of at least 22 feet to allow for slope stabilization and restoration efforts in the dunes. The well pad would be similar in size to the Lemon/Lemon seed proposal, but with greater overall wildlife habitat removal and impacts. While visually assessing a tentative flowline route from the pad to one the existing pipelines, it was evident that wetland avoidance would be very difficult. Based on the visual assessment, additional impacts to dunes and vegetation, and the fact that another well pad would have to be used to reach the second target, this site was dropped from consideration.

Gulf of Mexico Alternative: An offshore location in the Gulf of Mexico was also considered as a possible location to access the targeted gas reserves. A well location in the Gulf of Mexico within two miles of the park would increase the risk of a spill event, increase the potential for litter-related environmental impacts, negatively impact the viewshed, and increase the cost of drilling and operating the well. This location would also reduce options for drilling to multiple targets, as it would be against the fault angle, and therefore prohibit the drilling to multiple bottom-hole locations from a single offshore location. To reach multiple bottom-hole locations, a jack-up rig would need to be re-positioned for each location during the drilling phase. In the event that gas production occurred at each location, multiple production platforms would be constructed and thereby pose long-term visual impacts and increase the potential for gas byproducts, such as condensate spilling into the Gulf and affecting beach visitors and wildlife.

Lastly, the targeted bottom-hole locations occur within a 2-mile setback from the shoreline established by the National Park Service and the Texas General Land Office. This setback requires that oil or gas exploratory wells and production operations, targeting reserves within two miles of the shoreline, be drilled from outside of two miles between September 15 to March 15 (PAIS, 2000, pg. 4-56) to minimize visual impacts to visitors, and secondarily to protect sea turtles. Additionally, there is a three-mile setback from March 15 to September 15 during the height of the visitor season and secondarily during the sea turtle nesting season. Where possible, park policy is to place wells behind the dunes and drill directionally to reduce visual impacts to the greater majority of visitors. This alternative proposal does not comply with this policy.

Based on the increased risk of a spill event, long-term visual impacts to park visitors recreating the Gulf beach, a greater potential for accidental spill events, the estimated increase in costs associated with the drilling of multiple offshore well locations to reach

NPS DOCUMENT # 582

all targeted bottom-hole locations, and the non-compliance with park policy (NPS-FEIS, 2000) the Gulf of Mexico alternative was dismissed.

Alternative Flow Line Location: An alternative flow line route approximately three miles south of the presently proposed location was examined. This route was proposed because it is an existing pipeline facility located at Yarborough Pass, which is operated by Duke Energy. The Duke Energy pipeline is not in operation and is in non-compliance because there are portions of the pipeline that are exposed aboveground thereby violating state regulations. The pipeline cannot be used to transport product within Padre Island National Seashore until Duke Energy brings the pipeline into compliance with its Plan of Operations. To do this, approximately 784,080 sq. ft. (18 ac.) of uplands and 10,890 sq. ft. (0.25 ac.) of wetlands would need to be disturbed to rebury the exposed portions of the pipeline. In addition, to tie it into the Lemon or Lemon Seed flow lines, another 215,000 sq. ft. (4.9 ac.) of uplands and 1,383 sq. ft. (.032 ac.) of wetlands would be impacted by the proposed flow line.

Based on the increased impact to park upland and wetland habitats, associated access and maintenance requirements, and the issue of non-compliance of Duke Energy's pipeline, this alternative was dismissed.

Alternative Well Access: An alternate access route for accessing the presently proposed Lemon/Lemon seed well location was suggested by BNP. This route involved the establishment of a new access road behind the dunes, originating at the end of pavement of Park Road 22 and extending 12.5 miles south to the proposed well locations. This route would entail six and one-half (6.5) miles of new road from Park Road 22, connecting to an existing unpaved route at the Pan Am Road for approximately three (3) miles, then construct new road for the next two and one-half (2.5) miles to the proposed well site. The last part of the road construction would follow the proposed flow line route, and be placed adjacent to the line. Expected impacts to large acreages of uplands, backdune habitat, wetlands, bird habitat, cultural resources, and the potential to impact Piping plover foraging areas make this alternative unattractive. In addition, to meet the executive order outlining no net loss of wetlands, impacts to wetland habitats would require replacement mitigation, at the current NPS policy rate of 2:1 or as much as 5:1. So, due to the potential loss of wetland habitat, costs to construct such a road, and the potential for misuse by unauthorized recreational vehicle use, this idea was rejected early in the process.

Therefore, based on the substantial impacts to park wetland habitats, the lack of suitable mitigation sites within the park, and the potential impact to Piping Plovers and other protected species, impacts to cultural resources, and the potential misuse by recreational vehicles, this alternative was dismissed.

Alternative Seasonal Closure:
A seasonal closure for the protection of sea turtle species and their habitat, and for protected shorebirds was considered. This closure would occur between March 15 to September 30, affecting all oil and gas activity. A closure of this type would require all oil

NPS DOCUMENT#: 582

and gas operations to be conducted outside of the sea turtle nesting and hatchling emergence season, allowing drilling to occur only during the months of October thru February. There are also concerns with closures related to hurricane season, the winter occurrence of the threatened Piping Plover and endangered Brown Pelican, and seasonally occurring above average high tides.

The beach is also considered a roadway by the Texas Open Beaches Act, which allows unrestricted public vehicle access to the Gulf of Mexico. Restricting access by oil and gas operators and heavy equipment to five months of the year may not be supportable since the mineral leases require "reasonable access." Since 500,000 visitors use the beaches each year, closing down beach use to a selected small number of oil and gas operators (making less than 20 round trips of traffic per day) seems too restrictive for the potential resource impacts. This restriction may not allow the lessee to exercise their rights to drill multiple wells from within the park. It may also require that the drilling rig(s) to be demobilized and moved repeatedly up and down the beach, or to have more than one rig operating at a time. Impacts associated with the repeated mobilization of the drilling rig and associated equipment would increase impacts to visitors, other non-sea turtle species of concern, vegetation habitats, and increase the operating costs to the contractor. Such a closure would result in a concentration of impacts over a shorter amount of time, and may not allow for natural recovery of the beach and associated access routes between operations.

Some benefits may occur to shoreline species that utilize the beach to nest, forage, or loaf during the closure. The public would not be subjected to the type of traffic volume during high visitation periods, and the chances of crushing or impacting nesting sea turtles, their nests, or any hatchlings left on the beach would be somewhat reduced. There would still be potential impacts from public use and recreation of the beach during this seasonal closure. Even though there are added benefits to sea turtles and summer visitors, the potential for greater impacts due to heavier concentration of oil and gas activities created by the seasonal window outweighed the potential benefits.

Based on the greater concentration of impacts in the short-term, the increased risk to equipment and personnel, the health and safety issues related to hurricanes, the potential impact to Piping Plovers and other protected and non-protected species of shorebirds, and the expected increase in economic costs associated with more frequent or repeated mobilization of the drilling rig and associated equipment, this alternative was dismissed.

11. DESCRIPTION OF THE AFFECTED ENVIRONMENT:

General Park Description

Padre Island National Seashore is located on a largely undeveloped barrier island in southern Texas, on the Gulf of Mexico. The National Seashore consists of approximately 130,000 acres of land and water, is approximately 70 miles in length, and varies from one-half to three miles in width. The seashore is bordered on the east by the Gulf of Mexico and is separated from the Texas mainland, to the west, by the Laguna Madre, a shallow, hypersaline body of water. Padre Island National Seashore is the

NPS DOCUMENT # 582

longest stretch of undeveloped barrier island in the world, providing primitive beach recreation, wildlife viewing, and scenic solitude.

The barrier island is a dynamic system subject to many geologic forces and climatic events. The barrier island was formed, and is continually being reshaped, by the actions of wind, gulf currents, and waves. The seashore's landscape changes from broad, white, fine-sand beaches on the Gulf side, to ridges of fore-island sand dunes, to grassy interior upland flats dotted with smaller dunes, and ephemeral ponds and freshwater wetlands. The western portion of the Seashore is defined by the Laguna Madre and the back-island dunes and wind tidal flats that merge with the waters of the Laguna Madre. There are also two natural and 20 man-made spoil islands in the Laguna that lie within the National Seashore.

The park encompasses thousands of acres of wetlands that are important habitat for numerous aquatic species. Approximately 60 percent (78,000 ac.) of the area between the gulf dune line and the Laguna Madre is comprised of a rich variety of wetlands, including estuarine emergent wetlands, freshwater ponds, wind tidal algal flats, Laguna Madre intertidal zone, lagoonal seagrass beds, and marshes. The remaining 40 percent (55,000 ac.) includes Gulf of Mexico waters to the two-fathom line, Gulf beach, coastal prairie grassland, and sparsely vegetated dunes.

The park provides habitat and protection for a variety of animal and plant species. Over 345 species of birds utilize the park, including Neotropical migrants, grassland birds, colonial waterbirds, and other species (Chaney *et. al* 1995a, 1995b, 1998, McCraken and Clark, 1990, Blacklock 1997). Fifty-three mammal species have been documented, including marine and terrestrial mammals (Baccus and Horton 1979, Goetze *et. al.* 1997, Negrete *et. al.* 1999, Rabalais, 1975). Fifty-seven species of aquatic and terrestrial reptiles and 150 species of freshwater and marine fish are known to utilize the park (PAIS 1971, Shaver 1984, Chaney 1988). Over 456 plant species occur within the park (PAIS 1999, Nelson 1979).

Visitor Use

The northern portion of the National Seashore is where most park development is located. Current park development includes a Visitor Center, Entrance Station, Park Headquarters and Maintenance facilities, Malaquite Campground, and Bird Island Basin.

Visitor use typically begins to increase in May and peaks in August, with the fewest visitors in December. Annual park visitation in 2000 was 754,045. There are no recent figures tracking use on park beaches, but information from Ditton and Gramann's (1987) publication, "A survey of Down-Island Visitors and Their Use Patterns at Padre Island National Seashore," indicated the following patterns:

Summarize in 1-3 sentences ~~instead~~ ~~in~~ ~~Background~~

1. Over one-half of visitors interviewed reported traveling no farther down-island than four miles past the end of the paved road (Park Road 22).
2. Seventy percent of beach users utilize the first 5 miles of south beach (denoted by "4-wheel drive only" sign) for their visit.

NPS DOCUMENT # 582

3. Almost 18 percent travel south of Little Shell Beach, even though individual destinations south of Little Shell Beach do not display high visitation.
4. Visitation patterns are similar in July, August, and September.
5. More fishermen use areas south of Yarborough Pass (15 mile Marker) than beach users.

Extrapolating visitation figures from Ditton and Gramann's 1987 study, given little or no change in visitor use patterns, the park estimates approximately 527,800 people recreate on the Gulf shoreline of South Beach each year. Of these users, only 18 percent, or 95,000 visitors, venture farther south than Little Shell Beach. Little Shell Beach begins around Mile Marker 6 and extends south to Mile Marker 9, approximately.

These beach areas can be divided up into two-wheel drive accessible, four-wheel drive only recommended, and "closed" beach (no vehicle use). The Lemon/Lemon Seed project area encompasses the first 12.5 miles of "South" beach, beginning at the end of the paved section of Park road 22 and terminating just north of Yarborough Pass at the 12.5-mile mark. Most camping and a large portion of beach day use occur on the first five miles of "South" beach. South of the five-mile marker, at the four-wheel drive only sign, the number of visitors heading south towards Mansfield Channel decreases considerably.

Statistics show that about 25 percent of annual visitors utilize Bird Island Basin to camp and provide access to the Laguna Madre for their recreational opportunities. Some of these visitors will also use the Gulf for day use activities. The Gulf shoreline is used for recreational opportunities like surf fishing, swimming, shell collection, sunbathing, camping, and vehicle access to more remote areas of the beach (60+ miles). Padre Island NS estimates that up to 50 percent of beach users arrive in two-wheel drive vehicles and concentrate their use on the Gulf shoreline at "North beach," the Malaquite Visitor Center (using "closed" beach), and the first five miles of "South beach." Eighteen percent (95,000) take the opportunity to access remote beach areas south of the five-mile marker, like Yarborough Pass and the Port Mansfield Channel, that are accessible (recommended) only to four-wheel drive vehicles.

Use of the backcountry, behind the dune line and across the island to the Laguna Madre, are of more limited interest in part because of the lack of access, and Padre Island NS regulations and restrictions regarding the use of the dunes and wind tidal mud flats, etc., found in the center of the island.

Impacts on the visitor from the BNP project are expected to be from viewing the increased truck traffic, and being subjected to the noise generated by the larger trucks used for hauling drilling and production equipment, etc. to and from the site. In order to provide an idea of the level of truck traffic expected during this project, Table 1 lists the weekly number of oil and gas vehicles that were involved in a drilling operation located at Yarborough Pass. This operation spanned four months and averaged approximately 13 total trucks each day, which included four escorted large trucks and nine pickup trucks.

NPS DOCUMENT# 582

Table 1. Weekly Number of Oil and Gas Vehicles Driving On the Gulf Beach to Access the Dunn-Murdock Well Located at Yarborough Pass.

Week Of	Weekly Truck Total	Pickup Trucks	Escorted Large Trucks
Feb. 3 – 9	12	10	2
Feb. 10 – 16	12	12	0
Feb. 16 – 23	11	10	1
Feb. 24 – Mar. 2	85	57	28
Mar. 3 – 9	56	33	23
Mar. 10 – 16	16	15	1
Mar. 17 – 23	193	103	90
Mar. 24 – 30	166	126	40
Mar. 31 – April	149	89	60
April 7 – 13	128	81	47
April 14 – 20	149	94	55
April 21 – 27	122	76	46
April 28 – May 4	93	72	21
May 5 – 11	81	54	27
May 12 – 18	74	57	17
May 19 – 25	69	52	17
May 26 – June 1	79	49	30
Total 117 days	**1,495**	**990**	**505**

Proposed Action

This section will focus on the action areas and project area for purposes of this biological assessment.

Action Area (paved access road and beach access)

The action area for the proposed project begins at the park's Northern boundary and extends southward to the project area located at the 12.5-mile mark. Vehicles and equipment associated with this project will utilize Park Road 22, the southern end of the Visitor Center's parking lot, and 12.5 miles of Gulf Beach.

Project Area (dune access road, well pad, pipeline, associated facilities)

The project area for this operation is located approximately 12.5 miles south of the end of Park Road 22 and 900 feet inland from the Gulf of Mexico (Figure 1). All vehicles used during construction, drilling, and production operations will enter the park via Park

NPS DOCUMENT# 582

Road 22 and then proceed south down the beach to the project location. The proposed project includes the Gulf beach for access and grassland and wetland habitats for construction of an access road, drill pad, and flow line. The area in the vicinity of the proposed work is comprised of a diverse group of habitats.

The proposed operation will involve the development of an access road, construction of a well pad, establishment of a water well, establishment of two gas wells, and the creation of a production facility with its associated flow line if one or both wells are productive (Figure 2).

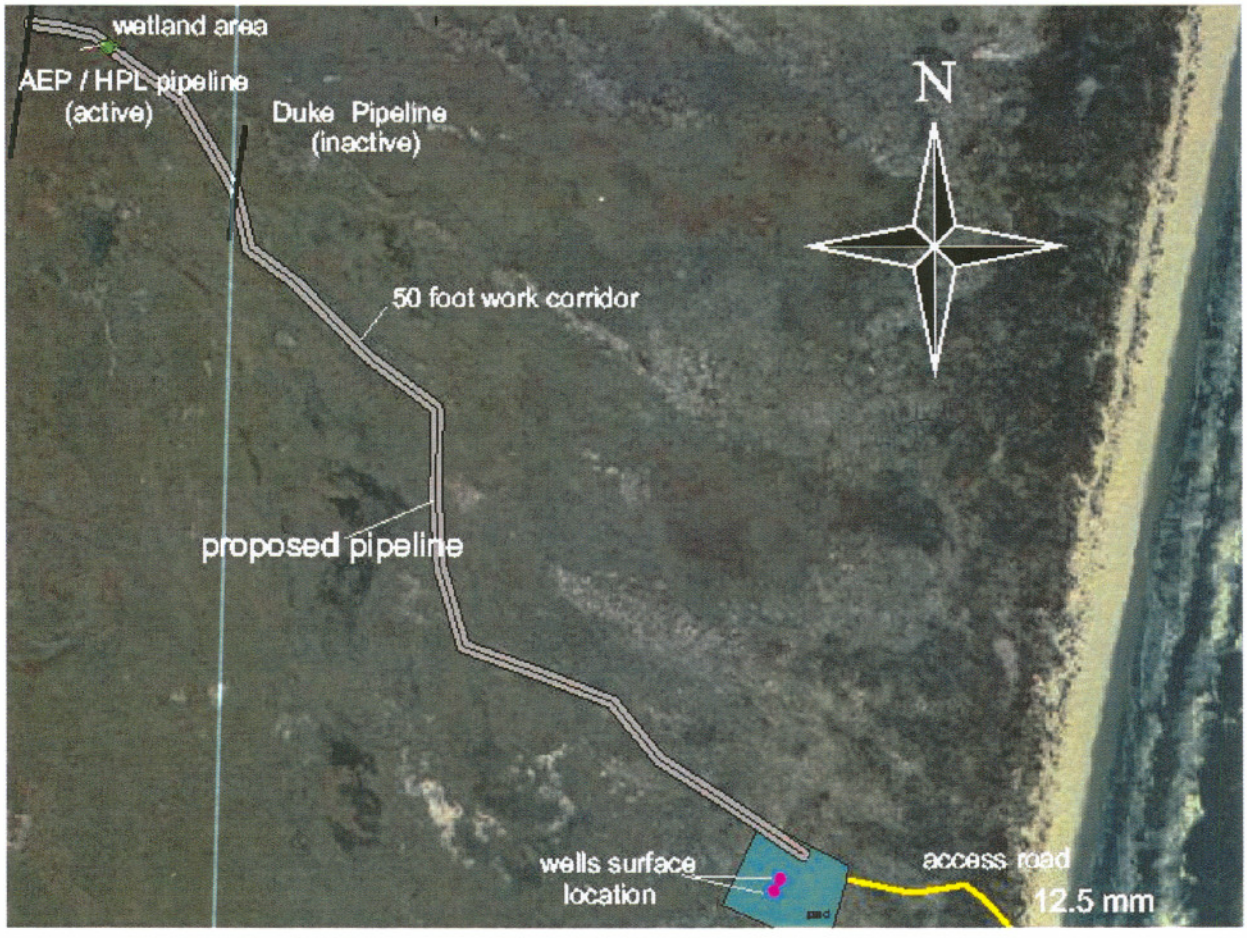


Figure 2. Project area.

Access Road

The proposed road, which is 790 linear ft. in length, will require an opening in the foredune ridge to allow access to the drilling location (Photo 1). The roadway will result in the filling and leveling of 21,800 sq. ft. (.5 ac.) of park habitat, which includes

NPS DOCUMENT#: 582



Photo 1. Proposed dune access.

approximately 12,800 sq. ft. (.3 ac.) of hummocky uplands and approximately 9,000 sq. ft. (.2 ac.) of foredunes.

Drill Pad

The proposed drill site was selected because it would avoid most impacts to wetlands, tidal flats, dunes, and other sensitive resource areas. This location offers the opportunity for the operator to drill multiple targets from a single location, thus reducing ground impacts resulting from the construction of multiple pads and access routes (Figure 3.). This is an isolated area with no previous disturbance.

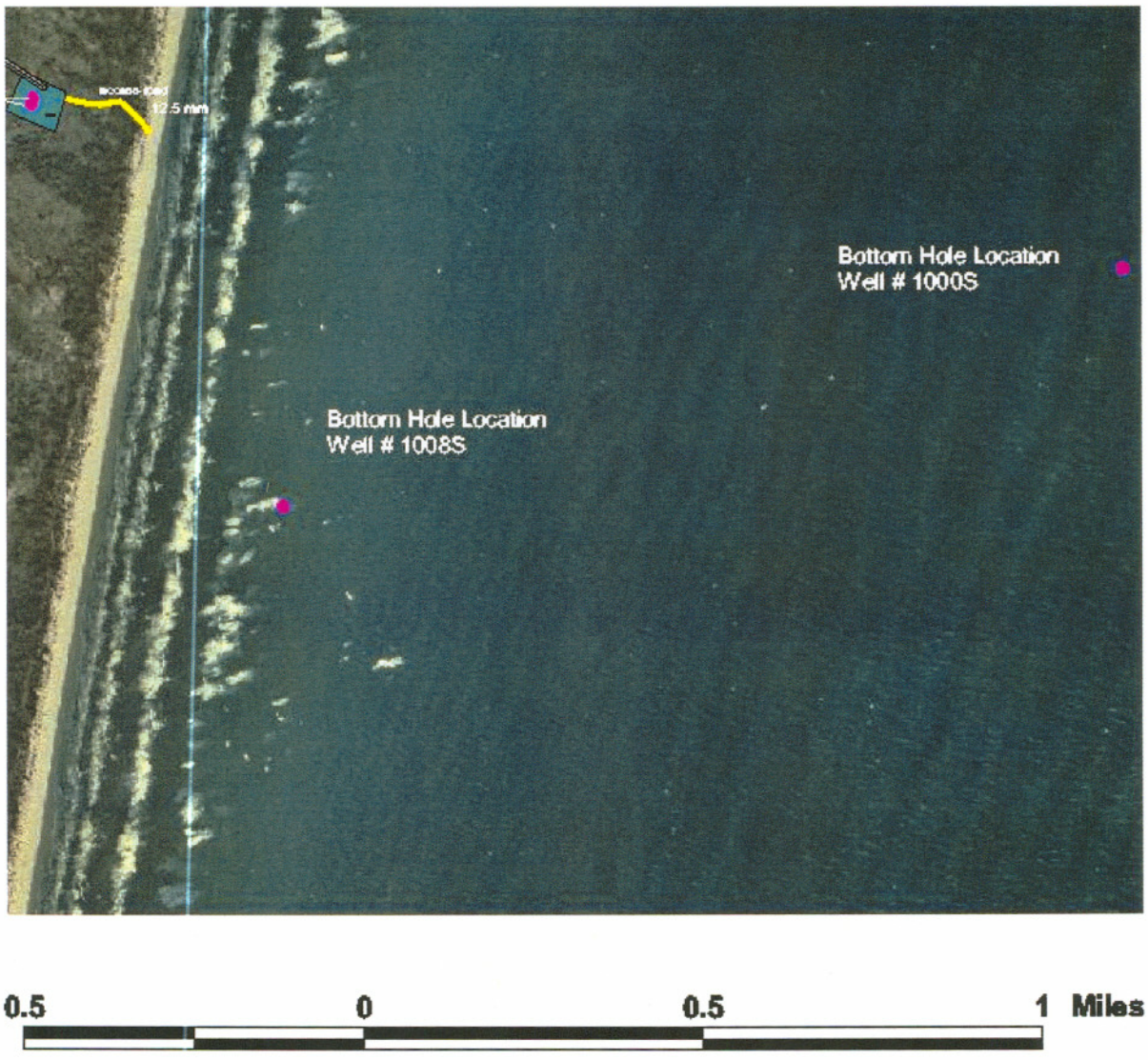


Figure 3. Proposed bottom hole locations for wells.

NPS DOCUMENT # 582

Production Facility and Associated Flow Line

The wetland area (0.03 acres) that would be temporarily impacted by the flow line construction is classified as palustrine emergent seasonally flooded (PEMC), and is located in a draw between two hummocks. This wetland is not identified on the US Fish and Wildlife Service's National Wetland Inventory map (NWI). The NWI map shows PEMC wetlands on either side of the proposed pipeline and in reality, the PEMC wetlands are joined.

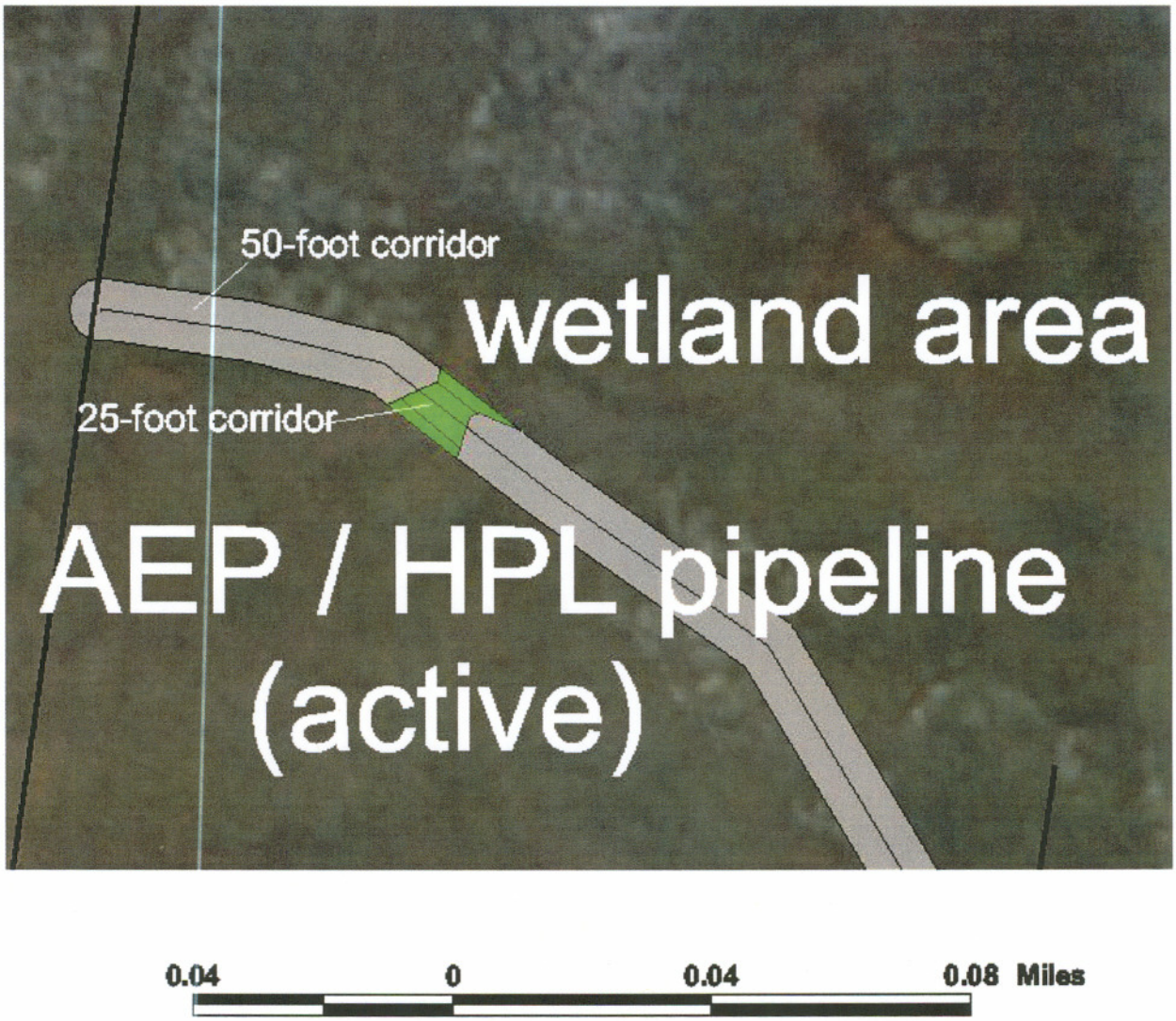


Figure 4. Wetland area associated with the flow line.

12. VEGETATION CLASSIFICATIONS:

The park contains a variety of vegetation classifications including emergent wetland, sparsely vegetated uplands, wind tidal flats, open water, and grasslands. Table 2 summarizes the landcover classification types at Padre Island National Seashore (Laine and Ramsey, 1998).

NPS DOCUMENT # 582

Table 2. Vegetation Classes For Padre Island National Seashore.

Land Classification Type	Acres	% Park
Inland Waters (ephemeral and permanent freshwater ponds)	2,342	1.8%
Laguna Madre	30,503	23.4%
Gulf of Mexico	12,775	9.8%
Wind-Tidal Flats	28,287	21.7%
Sparse Vegetation	6,000	4.6%
Emergent Vegetation	19,273	14.8%
Grassland	13,427	10.3%
Beach/Sand	3,259	2.5%
Urban (park development)	391	0.3%
Dunes (foredunes and back island dunes)	6,127	4.7%
Unconsolidated Shore	6,518	5.0%
Washover Channels	1,192	0.9%
Rookery Islands	261	0.2%
Total	130,355	100.00%



Photo 2. Foredune vegetation.



Photo 3. Upland vegetation.

Higher elevations near the Gulf beach are made up of two rows of foredunes adjacent to the Gulf Beach and high dune fields with scattered upland swales. The two rows of foredunes are typically dominated by silver-leaf croton (*Croton punctatus*), beach morninglory (*Ipomoea pes-caprae*), camphorweed (*Heterotheca subaxillaris*), prairie clover (*Dalea sp.*), western ragweed (*Ambrosia psilostachya*), and sea oats (*Uniola paniculata*) (Photo 2). The high dune fields are generally dominated by camphorweed, Prairie clover, sea oats, seacoast bluestem (*Schizachyrium scoparium*), western ragweed (*Ambrosia psilostachya*), and some tropic croton (*Croton glandulosus* var. *lindheimeri*).

The majority of the work area is comprised of hummock uplands. Hummocky uplands are typically dominated by gulfdune paspalum (*Paspalum monostachyum*), and seacoast bluestem (Photo 3). Slim-leaf rosette grass (*Dichanthelium linearifolium*) tends to dominate the lower areas. The transitional areas are typically dominated by marsh hay

NPS DOCUMENT # 582

cordgrass (*Spartina patens*), bulrush *(Schoenoplectus americanus)*, and Gulf dune paspalum (*Paspalum monostachyum*), with sea ox-eye daisy (*Borrichia frutescens*), narrowleaf sumpweed *(Iva angustifolia)*, bushy bluestem *(Andropogon glomeratus)*, Carolina sea lavender (*Limonium carolinianum*), largeleaf pennywort *(Hydrocotyle bonariensis*, frog fruit (*Phyla nodiflora*), and slim-leaf rosette grass (*Dichanthelium linearifolium*).

13. THREATENED AND ENDANGERED SPECIES WITHIN PADRE ISLAND NATIONAL SEASHORE

Padre Island NS has no designated critical habitat within the park's boundary for any federally listed species. An existing U.S. Fish and Wildlife Recovery Action Plan for the Kemp's Ridley sea turtle assigns the task of patrolling for nesting sea turtles to the park. According to a January 8, 2002 listing of federally protected species and the Texas Parks and Wildlife Department's website (TPWD http://tpwd.state.tx.us/nature/endang/), 42 listed federal and state protected species potentially occur at Padre Island National Seashore. Of these, the 24 species that have actually been documented at Padre Island National Seashore are listed in Table 3. The remaining 18 species have either not been documented within the park and therefore will not likely to be affected by the proposed project. Table 3 also includes four state-protected species that have been documented in the park and will be addressed within this document.

Table 3. Federal and State Protected Species Occurring at Padre Island National Seashore. (T – Threatened, E – Endangered, SOC – Species of Concern, and S/A – Similar in Appearance)

SPECIES	FEDERAL	STATE
Reptiles and Amphibians		
American Alligator (*Alligator mississippiensis)*	T (S/A)	
Texas Horned Lizard (*Phrynosoma cornutum*)	SOC	T
Texas Indigo Snake (*Drymarchon corais erebennus)*		T
Turtles		
Kemp's Ridley Sea Turtle *(Lepidochelys kempii)*	E	E
Loggerhead Sea Turtle (*Caretta caretta)*	T	T
Green Sea Turtle (*Chelonia mydas)*	T	T
Atlantic Hawksbill Sea Turtle (*Eretmochelys imbricata*)	E	E
Leatherback Sea Turtle (*Dermochelys coriacea*)	E	E
Birds		
Eastern Brown Pelican (*Pelecanus occidentalis*)	E	E
Reddish Egret (*Egretta rufescens*)	SOC	T
White-faced Ibis (*Plegadis chihi*)	SOC	T
Wood Stork (*Mycteria americana*)		T
Interior Least Tern (*Sterna antillarum*)	E	E
Sooty Tern (*Sterna fuscata*)	T	
Black Tern *(Chlidonias niger)*	SOC	
Piping Plover (*Charadrius melodous*)	T	T

NPS DOCUMENT # 582

SPECIES	FEDERAL	STATE
Bald Eagle (lower 48 states) (*Haliaeetus leucocephalus*)	T	T
Northern Aplomado Falcon (*Falco femoralis septentrionalis*)	E	E
Ferruginous Hawk *(Buteo regalis)*	SOC	
Swallow-tailed Kite (*Elanoides forficatus*)		T
White-tailed Hawk (*Buteo albicaudatus*)		T
Peregrine Falcon (*Falco peregrinus*)	Delisted	E
Cerulean Warbler *(Dendroica cerulea)*	SOC	
Black-capped Vireo (*Vireo atricapillus*)	E	E
Tropical Parula (*Parula pitiayumi*)	SOC	T
Loggerhead Shrike *(Lanius ludovicianus)*	SOC	
Plants		
Roughseed Sea-purslane *(Sesuvium trianthemoides)*	SOC	

Reptiles and Amphibians

American Alligator

Biology and Ecology:

The American alligator (*Alligator mississippiensis)* has been declared recovered and was removed from the federal endangered species list in 1987. However, this species continues to be federally listed as threatened due to its similarity of appearance to the American crocodile (USFWS, http://ecos.fws.gov/servlet/SpeciesProfile?spcode=C000).

The American alligator is considered Nearctic since it is found from the Virginia-North Carolina border southward to the Rio Grande River in southern Texas.

Alligators are usually found in freshwater such as ponds, slow-moving rivers, swamps, marshes, and lakes. They can tolerate salt water but only for brief periods because they do not have salt glands. Female alligators generally remain in a small area while males occupy areas greater than two square miles. Both males and females extend their home ranges during the courting and breeding season (Schechter, http://animaldiversity.ummz.umich.edu/accounts/alligator/a._mississippiensis).

Alligators hunt primarily in the water and consume fish, turtles, snakes, and small mammals as adults and insects, snails, and small fish when they are young (smaller than six feet).

The American alligator does not migrate but will undergo periods of dormancy when the weather becomes cold. They may excavate a cave in a waterway leaving a portion of it above water during this time. These tunnels are often as long as 65 feet and provide protection during extreme hot or cold weather. However, in areas where water level fluctuates, alligators dig themselves into hollows, which fill with water.

The breeding season for the American alligator occurs between April and August. Alligators hatch in early August living in small groups. Juvenile alligators are defended

NPS DOCUMENT # 582

aggressively by the mother for the first few years of life. Sexual maturity is reached during the sixth year.

Only one American alligator has been documented in the park since 1991. This individual is known to reside in an area west of the Visitor Center that includes one of the park's three permanent freshwater ponds, the constructed wetlands associated with the parks water treatment facility, and the large ephemeral pond located in the center of the park. All sightings of this individual have occurred within two miles of this area and based on the sighting locations, it is likely that this animal is a male.

For the past several years, the home range for this individual has been concentrated at the constructed wetlands associated with the parks water treatment facility developed in 2001, and the large ephemeral pond located in the center of the park. This area is approximately one square mile in size. Both of these areas provide adequate habitat for foraging and resting provided enough freshwater and prey are available. Currently, the constructed wetlands are 40 percent full.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The habitat where this individual resides is located within the action area of this project. Vehicles traveling on Park Road 22 to access the Gulf beach pass along the eastern edge of where this reptile ranges. The northern portion of the project area is located within ½ mile while the southern portion of the project area is located approximately 12 miles from this individual's current range. Because of the unlikelihood of this individual traveling outside of its current range, and that American alligators do not prefer saltwater, it is not likely that this project will directly or indirectly affect this species.

Conservation Measures:
Heavy equipment and trucks traveling along Park Road 22 will need to access the project area located on the Gulf beach. All proposed project vehicles are required to adhere to the posted speed limit of 45 mph on this section of Park Road 22. However, all vehicles traveling to and from the project area are required to stop at the BNP dispatch office located at the southern end of the Visitor Center's parking lot. To gain access to this area, a small entrance and access road has to be traveled by these vehicles requiring the vehicles to slow to less than 10 mph. This reduction in speed and re-direction of project traffic diverts the larger trucks from the area of the alligator. The diversion should positively affect this species.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the American alligator in either the project or action areas.

Texas Horned Lizard

Biology and Ecology:

NPS DOCUMENT # 582

The Texas horned lizard (*Phrynosoma cornutum*) is considered a species of concern at the federal level and listed as threatened by the state.

The distribution of the Texas Horned Lizard ranges from Kansas down to Louisiana through Texas, Arizona, and into northern Mexico (Bockstanz, http://www.zo.utexas.edu/research/txherps/lizards/phrynosoma.cornutum.html). In Texas, it was originally seen throughout the state, but numbers dropped dramatically in the fifties and sixties due to the pet trade, habitat loss, and introduction of the exotic fire ant. As of 1998, Texas horned lizards are only seen in the western third of the state.

The Texas horned lizard is generally found in deserts, temperate grasslands, prairies, and scrubland (Todd, http://animaldiversity.ummz.umich.edu/accounts/phrynosoma/p._cornutum$narrative.html). These lizards utilize sandy, open areas with little vegetation often inhabiting abandoned animal burrows. It may simply cover itself with loose sand. Texas horned lizards are found in close proximity to the harvester ant (*Pogonomyrmex* spp) mounds, which are its main source of prey, but it will also forage on grasshoppers, beetles, and isopods. In order to obtain enough energy, adult Texas Horned Lizards must forage from several colonies of Harvester ants. The Texas Horned Lizards' daily activities are planned around the times of highest ant activity.

The Texas horned lizard does not migrate but will hibernate from late summer to late spring. Therefore, it is only seen on warm days in late spring and summer. Breeding begins once they emerge from hibernation beginning in late April and continuing into July. The age of reproductive maturity is not known, however they are full-grown adults at three years of age.

Texas horned lizards have been found on Padre Island north of the park, but have not been documented in the park. A herpetological survey is currently underway to document species occurrence and presence within the park. Information from this inventory will be used to develop management actions, increase park knowledge of those species documented, and help to formulate future protection measures.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The portion of the project area that may pose an effect on this species includes the access road, pad location and flow line construction. These activities will take place in habitat that could be preferred by this species. However, since this species has not been documented within the park, and current literature suggests that it occurs only in the western third of the state (Bockstanz, http://www.zo.utexas.edu/research/txherps/lizards/phrynosoma.cornutum.html), it is not likely that this project will directly or indirectly affects this species.

Conservation Measures:

NPS DOCUMENT # 582

Construction activities associated with the development of this project will take place in habitat that could be preferred by this species. If during the construction phase of this project, a Texas horned lizard is observed, construction activities will cease and park personnel will be notified. Based on a field review of the location, project operations may need to be rescheduled or altered to minimize or eliminate impacts to this species. In addition, park personnel will conduct inspections prior to the construction phase of this project and will be onsite periodically to ensure compliance with these stipulations.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Texas horned lizard in either the project or action areas.

Indigo Snake

Biology and Ecology:
The Texas indigo snake (*Drymarchon corais erebennus*) is not federally listed, but is state listed as threatened.

This species ranges from southern Texas southward along the Gulf coast into Veracruz and Hidalgo, Mexico generally inhabiting burrows in moist riparian breaks in the thorn brush woodlands and coastal mesquite savannah. It may also be seen in grassy plains or on coastal sandhill habitats (University of Texas, Http://www.zo.utexas.edu/research/txherps/snakes/drymarchon.corais.html)

Unlike many other snakes, indigo snakes are primarily diurnal predators. The Texas indigo snake feeds on frogs, turtles, small mammals, birds, and other snake species. This species mates between November and February and lays eggs between April and May. Indigo snakes also spend the first two years of life in seclusion (CCWild, Http://ccwild.cbi.tamucc.edu/naturalhistory/texas_indigo_snake/tisacc.htm

Padre Island National Seashore has grassy plains and coastal sandhill habitats that may be suitable for this species. Only one known specimen has been documented in the park. This specimen was collected from the park in the mid-1980's by Texas A&M University-Kingsville but has not been documented since.

A herpetological survey is currently underway to document species occurrence and presence within the park. Information from this inventory will be used to develop management actions, increase park knowledge of those species documented, and help to formulate future protection measures.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:

NPS DOCUMENT # 582

Within the project area, vibrations and noise from drilling machinery and construction vehicles may prompt indigo snakes that are present to leave the area temporarily, especially when initial construction begins. If individuals are displaced while foraging, they will likely acclimate and return to the area once routine noise levels are established. However, if disturbance occurs during the first two years of life, Texas indigo snakes may be impacted (displaced) since they spend this time in seclusion.

Conservation Measures:
This project is expected to be completed before mating season and well before spring when eggs will be laid. However, construction activities associated with the development of this project will take place in habitat that could be preferred by this species. If during the construction phase of this project, a Texas indigo snake is observed, construction activities will cease and park personnel will be notified. Based on information gathered at the location, project operations may need to be rescheduled or altered to minimize or eliminate impacts to this species. In addition, park personnel will conduct site inspections prior to and during the construction phase of this project and will be onsite periodically to ensure compliance with these stipulations.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Texas indigo snake in either the project or action areas.

Kemp's ridley sea turtle

Biology and Ecology:
The Kemp's ridley sea turtle (*Lepidochelys kempii)* is federally listed as an endangered species. It is the smallest of the sea turtles and adults reach maturity at about 10-15 years of age. Kemp's ridley turtles nest mostly during the daytime, often in groups called "arribadas". An individual Kemp's ridley may nest as many as three times a season (USFWS and NMFS, 1992), with an average of 2.5 clutches per season. Clutch size averages around 100 eggs. Hatchlings emerge after about 50 days of incubation and hatchling emergence occurs during the night or early morning. Kemp's ridleys are found in the Gulf of Mexico and Atlantic Ocean and some adjoining estuarine areas. Nesting occurs primarily in the vicinity of Rancho Nuevo, Tamaulipas, Mexico. Each year, some nests are also found at scattered locations between south Texas and Veracruz, Mexico. Very rarely, Kemp's ridleys nest at other locations in the U.S. outside of Texas and more Kemp's ridley nests are consistently found in south Texas, including at Padre Island NS, than at any other location in the U.S.

At the national seashore, some Kemp's ridley turtles nest every year and many are found stranded (washed ashore, alive or dead) (Shaver, 1997, 1998a, 1998b, 1999a, 1999b; Shaver and Caillouet, 1998). Additionally, Kemp's ridley turtles sometimes inhabit nearshore Gulf of Mexico waters at Padre Island NS for foraging or migration

Historic nesting frequency of this sea turtle on the south Texas coast is poorly known and only six Kemp's ridley turtles were documented there prior to 1979 (Shaver and

NPS DOCUMENT # 582

Caillouet, 1998). A total of 100 Kemp's ridley nests have been documented along the Texas coast since 1979. Kemp's ridley is a native nester at Padre Island NS (Hildebrand, 1963, 1981, 1983; Shaver, 1998a; Shaver and Caillouet, 1998). Since 1978, an international, experimental project involving the National Park Service at Padre Island National Seashore, USFWS, NMFS/NOAA, etc., has been on-going to establish a secondary nesting colony of Kemp's ridley turtles at Padre Island NS. Eggs were collected in Mexico, transported to Padre Island NS, and placed into an incubation facility there. Hatchlings were released on the beach, allowed to enter the surf and were recaptured. They were then shipped to the National Marine Fisheries Service Laboratory in Galveston, Texas for 9-11 months of rearing in captivity (head-starting) and the yearling turtles were subsequently released into the Gulf of Mexico. It was hoped that these procedures would cause the turtles to be imprinted to Padre Island NS and return there to nest when they were sexually mature. Since 1996, some turtles from this project have been documented returning to south Texas and Padre Island NS to lay eggs (Shaver, 1997, 1998a, 1999a, 1999b; Shaver and Caillouet, 1998).

In 1986, an NPS and USFWS program was initiated to detect, monitor, and protect sea turtle nests at Padre Island NS and this on-going program has expanded since that time. Detection involves patrols to look for nesting activity, public education, and investigation of reports from patrollers, beach workers, and the public. Patrollers (U.S. Geological Survey (USGS) and NPS staff members and volunteers) use ATVs to search the park and adjacent state beaches to the north of the park for sea turtle tracks and nesting Kemp's ridley turtles each day, from April through mid –July. From 1979-2001, 45 Kemp's ridley nests were confirmed at in the park, but additional nests were likely missed, especially when patrols were not conducted or were less comprehensive. The 45 Kemp's ridley nests were distributed along the entire Gulf beachfront length of Padre Island NS.

The date of the nesting season varies slightly each year. In Mexico, Kemp's ridley nests have been recorded as early as March and as late as August. The 45 nests documented at Padre Island NS from 1979-2001 were found during the months of April, May, and June, the months that beach surveys were conducted most intensively. Nesting may also occur at the national seashore during other months, but this has not been confirmed. A dead Kemp's ridley turtle containing eggs was found washed ashore at the national seashore during July, and Kemp's ridley tracks have been documented in July as well.

Critical Habitat:

No critical habitat has been designated for this species. There is an existing Recovery Plan for the Kemp's ridley that defines specific NPS tasks in the recovery efforts. However, this is the only federally listed species in the park with Recovery Plan responsibilities.

Potential Effects of Proposed Project:

NPS DOCUMENT # 582

There may be times when eggs, nesting turtles, hatchlings, and stranded turtles could be **directly** vulnerable to activities within the project action area.

Operation of all vehicles (including oil and gas heavy equipment) on the beach can crush nesting turtles, stranded turtles, hatchlings, and some eggs, producing an immediate, lethal impact (Mann, 1977; NMFS and USSFWS, 1991a, 1991b, 1992-1993; Ernest et al., 1998). Vehicles could also remove sea turtle tracks, making it impossible for the USGS and NPS to find a nest for investigation and protection.

Turtle hatchlings and smaller stranded sea turtles could become trapped in the ruts for short or long periods of time causing them to weaken, invert, or succumb due to predation, disorientation, crushing, or dehydration (Hosier et al., 1981; Fletemeyer, 1996; Ernest et al., 1998). According to Dr. Donna Shaver, sea turtle expert and Station Leader of the USGS Padre Island Field Research Station, the depth and slope of the ruts will influence the amount of impact (personal observation). Deeper and more steeply sloped ruts will cause the greatest impact. Hosier et al. (1981) found that 10-15 cm deep tracks may serve as a significant impediment to loggerhead hatchlings. The smaller the turtle the more that it will be impacted by rut size. Vehicles can also compact the sand, making it more difficult or impossible for nesting turtles to excavate a nest cavity leading 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 on the level of compaction necessary to inhibit or prevent nesting, or inhibit or prevent hatchling emergence is not available. There is no documented evidence that suggests what amount or level of traffic in a sandy environment, like Padre Island NS, is allowable before the threshold of impacts are noticeable to the sea turtle.

Operation of vehicles on the beach can cause **indirect** impacts to the sand that adversely affect nesting and incubation habitat (Mann, 1977; NMFS and USFWS, 1991a, 1991b, 1992-1993; Ernest et al., 1998). Project vehicles will produce deeper ruts in the sand, which could affect movements of nesting females and hatchlings.

To reduce direct impacts that can occur from rutting, ruts will be back filled. However, since backfilling ruts and leveling of the beach surface may cause indirect and direct impacts (including compaction of sand, covering or removal of sea turtle tracks, and crushing of nests and turtles), so existing methods used to fill ruts will be reviewed and monitored on a periodic basis by the NPS, USGS and USFWS. There is no data to show that sand in these back filled areas is compacted enough to inhibit nesting, and most nesting activity does not occur in the normal travel corridor near to the tidal zone.

Vibrations and noise caused by moving vehicles on the beach could frighten nesting turtles, causing them to abandon their nesting attempt (false crawl) (NMFS and USFWS 1991a, 1991b, 1992; Ernest et al., 1998). Vibrations could also harm incubating eggs. It is difficult to assess these areas as scientific data is lacking to fully understand the level of impact on sea turtles from traffic vibrations or noise. From observations of traffic and wildlife interactions, there is no question that seeing the vehicle at the waters edge would cause the sea turtle to move back into the water. One would expect this type of reaction

NPS DOCUMENT # 582

of wildlife to man's presence (on foot or in a vehicle). The effect of vibrations from people or from vehicles on the beach during a nesting event does not show a strong negative correlation to date. People driving on the beach often spot nesting sea turtles and can often approach them without disturbing the nesting activity, once she is laying the eggs.

Vehicle lights can also cause **indirect** impacts on nesting turtles leading to false crawls and can disorient hatchlings so that they crawl in the wrong direction rather than enter the sea, thereby becoming **directly** vulnerable to crushing, predation, and dehydration (NMFS and USFWS 1991a, 1991b; Fletemeyer, 1996). Since oil and gas nighttime transportation of heavy equipment is not permitted during the sea turtle nesting season, this light issue is confined to four-wheel drive trucks associated with the BNP program, and 2-wheel and 4-wheel drive vehicles used by the public. It is understood that there are over 500,000 trips down the action area of the beach each year by park visitors, many of which operate at night. Nesting Kemp's ridley turtles will most likely not be affected, as they are primarily daytime nesters.

So this leaves those species of sea turtle that nest primarily at night (green, loggerhead and hawksbill) likely to be the most affected by night driving and associated lighting. Based on documented nesting, the total number of these three species of sea turtle nesting at Padre Island NS, within the action area of the project, would be less than three over a 15-year span. The risk of loss to nesting turtles of these species is therefore very small. This would also apply to those hatchlings that emerge at night or early in the morning from the few in situ nests possibly missed by the daily patrols conducted by the NPS and USGS staff and volunteers.

Lights from the operations behind the dunes could indirectly cause false crawls and disorientation, if the lights are visible from the beach.

Conservation Measures:

This project potentially may impact threatened and endangered sea turtles that occur at PAIS in the action area, but mitigation measures and monitoring of the action will be implemented to reduce the potential impact on these species, and help to ensure that the project is not likely to adversely affect these species.

Currently the USGS and NPS remove all sea turtle eggs that are located from the beach and transfer them to the incubation facility at Padre Island NS. Hatching success is elevated substantially for eggs that are transferred to this facility rather than left on the beach in-situ. The USGS and NPS also protect nesting turtles while they are on the beach and remove stranded turtles for rehabilitation or study. However, some nests missed by the patrol and monitoring effort may go undetected and unprotected from predation, insect infestation, tidal inundation, and crushing. Additionally, some nesting and stranded turtles are not immediately found and protected by the NPS.

To reduce the direct impacts that could occur from crushing/covering nests or turtles, all vehicle operators will attend a training class held by the NPS/USGS. Monitors or

NPS DOCUMENT # 582

observers will travel in front of large vehicles and vehicles moving equipment, and drive at a reduced speed (10 to 15 mph maximum) to look for and help ensure that sea turtles, nests, and their tracks are protected. Observers will use ATVs during the sea turtle nesting and hatchling emergence season (April 1 through October 15) since it is much easier to see faint Kemp's ridley and other sea turtle tracks from ATVs. Vehicles will travel above the wet portion of the beach thereby reducing the chance of crushing stranded sea turtles. In addition, beginning the project outside the sea turtle nesting season will reduce the potential to encounter nesting Kemp's ridley and other sea turtles or their tracks.

Vehicles will travel in caravans when possible, and truck numbers will be limited by implementing existing measures (greater storage space, larger trucks) to decrease the amount of time that vehicles are traversing the beach during the sea turtle nesting season. This will further reduce the potential for affecting nesting turtles or hatchlings through vibrations and noise. As a beneficial effect to sea turtles, observers and vehicle operators from this project will provide additional observation and reporting opportunities and assist with NPS and USGS efforts to detect, investigate, monitor and protect nesting sea turtles, their nests, hatchlings, and stranded turtles.

Mitigation measures of night sky protection, use of directional and shielded lighting on the drilling rigs, prohibition of lighting on production facilities within the required setback of 500 feet from the dunes and other light-sensitive areas, and the night driving restrictions placed on operators of heavy equipment and trucks on the beach is thought to be adequate to prevent this impact, given current scientific data.

Conclusion

There has been vehicle traffic, both from visitors and heavy equipment operators, on the Gulf of Mexico shoreline for over twenty years with no documented case of a crushing of a nesting sea turtle within the park. The risk to a sea turtle in the action area of this project is reduced when looking at past nesting activity. The average number of nests per year over a five-year span, for the first 15 miles of south beach, is approximately three. In 2002, one of the highest nesting activity years since the beginning of the program (1986), there were six nests found within the action area. Current nesting activity does not seem to indicate compaction from vehicles, either by the public or from the operator, is causing a negative affect. Future research in this area is called for to better understand the compaction, sand component, and vehicle threshold effects.

Nesting activity for 2002 seem to support the idea that existing traffic levels (approximately 500,000 vehicles annually) do not currently have a large negative impact on nesting sea turtles. Looking at nesting data collected over the past 20 years for the action area, and given that most nests are found and removed from the beach by USGS and NPS staff, the potential impact of vibrations to eggs and crushing of nests would appear to be minimal. The chance that hatchlings could be killed by vehicle use at night along the stretch of beach within the action area of the project is minimal.

NPS DOCUMENT # 582

Therefore, given the moderate potential to negatively impact this species in the action area (there are possibilities to directly impact this species), and the reduced possibility for impacts in the proposed project area, the overall conclusion for this Biological Assessment is that the proposed project, with mitigation and conservation measures implemented, is not likely to adversely affect the Kemp's ridley sea turtle.

Loggerhead sea turtle

Biology and Ecology:

The loggerhead sea turtle (*Caretta caretta)* is federally listed as a threatened species. It occurs in temperate and tropical waters of both hemispheres. The species inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian oceans. Historic nesting frequency on the Texas coast is poorly known. Hildebrand (1981) suggested that nesting likely occurred within the last 300 years, but the earliest loggerhead nest that he was able to confirm for the Texas coast was found in 1977.

Adult loggerhead turtles reach maturity in 25 to 30 years. Loggerheads are nocturnal nesters, although some daytime nesting occurs. They nest from one to seven times within a nesting season (average of approximately 4.1 clutches); clutch size averages 100-125 eggs along the southeastern U.S. coast (NMFS and USFWS, 1991b). Hatchling emergence typically occurs at night. In the Gulf of Mexico, there are distinct nesting populations on the coast of the Florida panhandle and the Yucatan Peninsula. Scattered nests can be found occasionally along other areas of the U.S. Gulf coast including the Chandeleur Islands, Louisiana in the north and to the U.S./Mexico border in the south.

At Padre Island NS, loggerhead turtles sometimes inhabit nearshore Gulf of Mexico waters for foraging or migration. Additionally, a few occasionally nest at the national seashore and many more are found stranded there (Shaver, 1998b, 1999b).

As mentioned above in the Kemp's ridley section, an NPS and USFWS program was initiated in 1986 to detect, study, and protect Kemp's ridley nests at Padre Island NS and this on-going program has expanded to include the other four species of sea turtle. Detection for the following four species of sea turtles involves patrols to look for nesting activity, public education, and investigation of reports from patrollers, beach workers, in park contractors, and the public. Patrollers (USGS and NPS staff members and volunteers) use ATVs to search Padre Island NS ands the adjacent northern area of State beach for sea turtle tracks and nesting turtles. Each day, from April through mid-July, they repeatedly patrol the entire Gulf beachfront of the national seashore 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.

From 1979-2001, 19 loggerhead nests were documented at Padre Island NS (at various locations scattered along the coast of the national seashore), but additional nests were likely missed, especially when patrols are reduced and less comprehensive after the

NPS DOCUMENT # 582

mid-July Kemp's ridley patrol season ends. Loggerhead nests were found on North Padre Island from mid-May through early August, although nesting has been documented in the southeastern U.S. from late-April through early September.

Daily runs to the Port Mansfield Channel and back are made from mid-July through August to look for signs of nesting activity, but these patrols are subject to funding and staff availability.

Critical Habitat:
No critical habitat has been designated for this species at this park. There is no Recovery Plan task assigned to the NPS for this or the remaining three species of sea turtle occurring at the national seashore, however park and USGS staff and volunteers conduct, support and assist in the daily patrols for this species to protect, document, and monitor nesting occurrence.

Potential Effects of Proposed Project:
There is the small chance that this sea turtle can be directly impacted by vehicle use on the beach, including crushing of stranded turtles and undiscovered nests. Impacts that are more indirect like noise, vibration to nests or hatchlings, and vehicle and project area lighting can cause similar changes in behavior and therefore affect the species. Please see impacts associated with the Kemp's ridley (above) for broader discussion of related project impacts.

Conservation Measures:
The National Park Service is required by statutes and policy to employ measures to protect, assess, and monitor species occurrence and richness within the park boundary. This obligation is conducted through law enforcement presence and action, management of all endangered species and their habitat found within park boundaries, and development of land use and management practices that promote the continued existence of the plants and animals until removal from the Threatened and Endangered species list. We also attempt to assist State and other Federal agencies in their management responsibilities to protect those species found on lands adjacent to park property. We do this through visitor education and public awareness messages and involvement in adjacent land management issues that may affect park resources.

The conservation efforts related to this sea turtle, and the following species of sea turtle (3), are conducted to promote and enhance their recovery. Please consider the measures employed for use in the Kemp's ridley sea turtle effort as measures used to assist this and other species of sea turtle, as they are conducted concurrently with the same monies, diligence and staff time.

Conclusion:
Given the minimal potential to negatively impact this species in the action area (there are few possibilities to directly impact this species), and even less possibility in the proposed project area, the overall conclusion for this Biological Assessment is that the proposed

NPS DOCUMENT # 582

project, with mitigation and conservation measures implemented, is not likely to adversely affect the loggerhead sea turtle.

Green sea turtle

Biology and Ecology:

The green sea turtle (*Chelonia mydas)* is federally listed as threatened in all of its range except the waters of Florida and the Pacific coast of Mexico, where it is endangered. It is circumglobal in tropical and sub-tropical waters. A green 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). Although historic nesting by green turtles on the Texas coast is suspected, the first confirmed nest was not documented there until 1987 (Shaver, 2000).

Adult green turtles reach maturity at 30 to 50 years of age. Female green turtles nest at night. From one to seven clutches are deposited within a breeding season (the average number is usually two to three clutches) (NMFS and USFWS, 1991a). Average clutch size is usually 110-115 eggs. Hatchling emergence occurs at night. In this region, nesting sites include southern Florida and scattered locations in Mexico, although nesting occasionally occurs in south Texas.

At Padre Island NS, juvenile green sea turtles inhabit waters of the nearshore Gulf of Mexico, the Laguna Madre, and the Mansfield Channel. Additionally, a few green turtles occasionally nest within the national seashore and many are found stranded there each year (Shaver, 1989, 1998b, 2000)

As mentioned above, this species is monitored for nesting activity during the late summer as funding and staff is available. From 1979-2001, seven green turtle nests were documented at the park, all in roughly the southern half of the park (Shaver, 1989, 2000). However, additional nests were likely missed especially when patrols were not conducted or were less comprehensive. The seven green turtle nests were found during June and July, although nesting occurs from May through September in this region.

Critical Habitat:

No critical habitat has been designated for this species at this park. Please see loggerhead section above for more information.

Potential Effects of Proposed Project:

There is the very small chance that this sea turtle can be directly impacted by vehicle use on the beach, including crushing of stranded turtles and undiscovered nests. Impacts that are more indirect like noise, vibration to nests or hatchlings, and vehicle and project area lighting can cause similar changes in behavior, and therefore affect the species. Please see impacts associated with the Kemp's ridley (above) for broader discussion of related project impacts.

NPS DOCUMENT# 582

Conservation Measures:
The National Park Service is required by statutes and policy to employ measures to protect, assess, and monitor species occurrence and richness within the park boundary. This obligation is conducted through law enforcement presence and action, management of all endangered species and their habitat found within park boundaries, and development of land use and management practices that promote the continued existence of the plants and animals until removal from the Threatened and Endangered species list. We also attempt to assist State and other Federal agencies in their management responsibilities to protect those species found on lands adjacent to park property. We do this through visitor education and public awareness messages and involvement in adjacent land management issues that may affect park resources.

The conservation efforts related to this sea turtle, and the following species of sea turtle, are conducted to promote and enhance their recovery. Please consider the measures employed for use in the Kemp's ridley sea turtle effort as measures used to assist this and other species of sea turtle, as they are conducted concurrently with the same monies, diligence and staff time. Please see measures employed for use on the Kemp's ridley sea turtle as measures applicable to this species.

Conclusion:
Given the small potential to negatively impact this species in the action area (there are few possibilities to directly impact this species), and even less possibility in the proposed project area, the overall conclusion for this Biological Assessment is that the proposed project, with mitigation and conservation measures implemented, is not likely to adversely affect the green sea turtle.

Atlantic Hawksbill sea turtle

Biology and Ecology:
The hawksbill (*Eretmochelys imbricata)* is federally listed as endangered. It occurs in tropical and subtropical seas of the Atlantic, Pacific, and Indian oceans. Young hawksbills occur with some regularity in Texas waters, since northern currents carry them from nesting beaches in Mexico (Hildebrand, 1981). Historic nesting by this species on the Texas coast is unknown.

Female hawksbill turtles nest mostly during the night, but rare daytime nesting is known. They nest an average of 4.5 times per season (up to 12 clutches); clutch size averages approximately 140 eggs (NMFS and USFWS, 1993). Hatchling emergence occurs at night. Hawksbills nest on scattered islands and beaches between 25 degrees North and South latitude including beaches in southeastern Florida and the states of Campeche and Yucatan in Mexico. Nesting does not regularly occur on the Texas coast.

At Padre Island NS, young hawksbills occasionally inhabit waters of the nearshore Gulf of Mexico and Mansfield Channel. Additionally, many are found stranded in the park each year, but nesting very rarely occurs here (Shaver, 1998b, 1999b).

NPS DOCUMENT # 582

As mentioned above, this species is monitored for nesting activity during the late summer (Mid-July thru August) as funding and staff are available. Only one hawksbill nest has been recorded on the Texas coast (Shaver, 1999b), although it is possible that additional nests were missed, especially when patrols were not conducted or were less comprehensive. The single confirmed nest was located at the southern end of the national seashore in June 1998. The nesting season for hawksbills varies geographically and may extend from April through October in the Caribbean and Gulf coast of Mexico.

Critical Habitat:
No critical habitat has been designated for this species for this park. Please see loggerhead section above for more information.

Potential Effects of Proposed Project:
There is the remote chance that this sea turtle can be directly impacted by vehicle use on the beach, including crushing of stranded turtles and undiscovered nests. Impacts that are more indirect like noise, vibration to nests or hatchlings, and vehicle and project area lighting can cause similar changes in behavior and therefore affect the species. Please see impacts associated with the Kemp's ridley (above) for broader discussion of related project impacts.

Conservation Measures:
Please see those measures employed for use on the loggerhead sea turtle as those measures also apply to this species.

Conclusion:
Given the remote potential to negatively impact this species in the action area (there are few possibilities to directly impact this species), and even less possibility in the proposed project area, the overall conclusion for this Biological Assessment is that the proposed project, with mitigation and conservation measures implemented, is not likely to adversely affect the Atlantic hawksbill sea turtle.

Leatherback sea turtle

Biology and Ecology:
The leatherback sea turtle (*Dermochelys coriacea)* is federally listed as an endangered species. It ranges throughout the tropical waters of the Atlantic, Pacific, and Indian oceans, but has also been recorded from the North Atlantic, North Pacific, South Atlantic, and South Pacific. The leatherback is the largest and most pelagic sea turtle species and is normally found in the deeper waters of the Gulf of Mexico where it may undertake extensive migrations.

Nesting occurs primarily at night and diurnal nesting occurs only occasionally. They nest five to seven times per year, with an average clutch size of 110-116 eggs (NMFS and USFWS, 1992). Hatchling emergence typically occurs at night. Leatherback nesting grounds are distributed circumglobally. Leatherbacks infrequently strand at Padre Island NS (Shaver, 1998b).

NPS DOCUMENT # 582

Hildebrand (1963, 1981) reported leatherback nesting at Little Shell on Padre Island NS, including one documented nesting in 1928 and at least one observed nesting in the mid 1930's. No leatherback nests have been confirmed on the Texas coast since that time.

As mentioned above, this species is monitored for nesting activity during the late summer as funding and staff is available. No leatherback nests have been recorded within the park during recent years, although it is possible that a few were missed, especially when patrols were not conducted or were less comprehensive. In the U.S. and Caribbean, nesting begins in February and continues through July.

Critical Habitat:
No critical habitat has been designated for this species at this park.

Potential Effects of Proposed Project:
There is an unlikely chance that this sea turtle can be directly impacted by vehicle use on the beach, including crushing of stranded turtles and more indirect impacts like noise, vibration issues and effects on nesting attempts, and vehicle and project area lighting. Some changes in behavior can be expected from human interaction with this species, but actual occurrence in the park is rare. Please see impacts associated with the Kemp's ridley (above) for broader discussion of related project impacts.

Conservation Measures:
Please see those measures employed for use on the loggerhead sea turtle, as those measures also apply to this species.

Conclusion:
Given the very remote potential to negatively impact this species in the action area (there are few possibilities to directly impact this species), and even less possibility in the proposed project area, the overall conclusion for this Biological Assessment is that the proposed project, with mitigation and conservation measures implemented, is not likely to adversely affect the leatherback sea turtle.

Birds

Eastern Brown Pelican

Biology and Ecology:
Eastern Brown Pelicans *(Pelecanus occidentalis)* are federally and state listed as endangered. At one time, this bird's population fell to less than 100 birds between 1967 and 1974 (TPWD, http://tpwd.state.tx.us/nature/endang/birds/bpelican.htm). It is a coastal inhabitant whose range includes the southern United States and northern South America - from North Carolina to Venezuela and Trinidad in the Atlantic and from British Columbia to Chile on the Pacific coast.

This species is found along salt bays, beaches, and oceans. It is generally found near shallow waters adjacent to the coast, especially on sheltered bays. Occasionally Brown

NPS DOCUMENT # 582

Pelicans are seen well out to sea. Brown Pelicans feed almost entirely on fish including menhaden, smelt, and anchovies but can occasionally feed on crustaceans.

Brown pelicans nest in colonies on isolated islands where they are safe from predators. These islands may be either bare and rocky or covered with small mangroves, shrubs, or other trees. Stray individuals may appear on freshwater lakes inland. Nests may be a simple scrape, a heap of debris with a depression on the top, or a large stick nest located in a tree. Breeding season generally begins in early March and lasting until August. After the breeding season, flocks move north along both Atlantic and Pacific coasts. These birds return southward to warmer waters by winter. Small numbers of immatures regularly wander inland in summer, especially in the Southwest (Peterson Multimedia Guides, http://www.petersononline.com/birds/month/brpe/index.html).

Eastern Brown Pelicans occur in the park year-round along both the Gulf and Laguna Madre sides of Padre Island. Individuals utilize the park for resting and foraging, and are typically found in the nearshore and washover habitats. Some individuals migrate south during the winter months and return during the breeding season. Brown Pelicans forage along the Gulf beach shoreline searching for fish near the surface of the water.

In 1993, Dr. Allan Chaney recorded 356 Brown Pelicans over 64 miles of beach between Yarborough Pass and Port Mansfield Channel during a 1992-1993 shorebird survey. Twelve individuals were observed on the Laguna Madre shoreline while the remaining 344 individuals were observed in the washover channels located south of the 33 mile-marker. Forty-four individuals were observed between the park's north boundary and the 12.5-mile mark (Chaney *et. al.*, 1993a). In 1995, 553 birds were surveyed along the Gulf beach between the park's northern boundary and Yarborough Pass (Chaney *et. al.*, 1995b). In comparison, only one Brown Pelican was documented along the Laguna Madre shoreline between Yarborough Pass and the park's northern boundary (Chaney *et. al.*, 1995a). It is evident that Brown Pelicans prefer the Gulf beach shoreline instead of the Laguna Madre shoreline.

Brown Pelicans are generally found along the Gulf beach tide line in the morning hours and along the Laguna Madre shoreline and washover channels located in the southern portion of the park in the afternoons. When observed in the washover channels, Brown Pelicans were generally associated with Double Crested Cormorants, gulls, and terns. Brown Pelicans are not observed in other habitats within the park.

Based on nearly thirty years of park colonial waterbird census data, Brown Pelicans have not been documented nesting within the park (TCWD, http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls). However, they do nest on an island located in Corpus Christi Bay, which is located approximately 20 miles from the park.

Critical Habitat:
No critical habitat has been designated for this species.

NPS DOCUMENT# 582

Potential Effects of Proposed Project:
The action area includes 12.5 miles of Gulf beach habitat that is preferred by the Eastern Brown Pelican. However, the project area does not include any habitat utilize by this species.

Direct effects of the proposed project are associated with the vehicular traffic necessary for construction, drilling, and production activities and will occur only within the action area.

Heavy equipment and trucks will be traveling along the Gulf beach shoreline to access the drill site located behind the dunes at the 12.5-mile mark. This vehicular traffic will displace Brown Pelicans causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by park visitors are generally seen landing a short distance away and continuing to perform their pre-disturbance behavior.

No indirect effects of the proposed project are thought to occur.

Conservation Measures:
Vehicular traffic associated with the proposed project is directed to drive above the tide line. This area of the beach is generally farther away from the shorebirds that are found on the Gulf beach including Brown Pelicans. Additionally, vehicles associated with this project are grouped together prior to entering the beach and limited to no more than 15 mph despite a maximum posted speed limit of 25 mph. This should limit the amount of disturbance by limiting the disturbance to fewer instances. For example, instead of five trucks spaced a mile apart and therefore displacing an individual bird five times, the five trucks are grouped together so the individual is displaced only once.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Eastern Brown Pelican in either the project or action areas.

Reddish Egret

Biology and Ecology:
The Reddish Egret (*Egretta rufescens*) is considered a species of concern at the federal level and listed as threatened by the state.

Reddish Egrets range from the coast areas of Florida and the Gulf States, east and west coasts of Mexico, and the Greater Antilles. The wintering range for Reddish Egrets extends into the Lesser Antilles and coastal Venezuela (Rappole and Blacklock, 1994).

Reddish Egrets forage singly in shallow, saltwater habitats including lagoons, saltpans, and tidal pools. The primary food source for Reddish Egrets includes fish and marine invertebrates. Reddish egrets nest in colonies in isolated habitats, including islands, that are covered with dense, low woody vegetation such as common ragweed *(Ambrosia*

NPS DOCUMENT # 582

artemisiifolia), mesquite (*Prosopis glandulosa*), and sea ox-eye daisy (*Borrichia frutescens*). Nests are built at an elevation slightly higher than ground level. Breeding in Texas generally begins in early spring and extends into late summer.

Reddish Egrets are year round residents at Padre Island National Seashore and are typically found in and around the shallow waters of the Laguna Madre, the flooded wind tidal flats, and washover channels between the park's northern boundary southward to the Port Mansfield Channel (Chaney *et. al.*, 1993b and 1995a). During a 1994-1995 survey, four Reddish Egrets were documented on the Gulf beach shoreline between Yarborough Pass and the park's northern boundary compared to 1,200 found along the Laguna Madre shoreline for the same area (Chaney *et. al.*, 1995a). Additionally, 43 Reddish Egrets were documented on the Gulf beach between Yarborough Pass and the Port Mansfield Channel compared to 1,760 found along the Laguna Madre shoreline for the same area in 1993 (Chaney *et. al.*, 1993a). Both of these studies show that the Reddish Egret prefers the Laguna Madre habitat to the Gulf beach. The largest numbers of Reddish Egrets have been documented during the summer and winter months. During 1994-1995, 81.5% of Reddish Egrets surveyed occurred along the Laguna Madre between the 10-mile mark and 15- mile mark (Yarborough Pass).

During the month of May, a colonial waterbird census is conducted for all rookery islands in the Laguna Madre. This effort is a partnership with the U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, Padre Island National Seashore, and local researchers and birding experts. The colonial waterbird census began in 1973 and has documented nesting levels and changes annually since then.

Breeding generally begins in early spring and can extend into August. Since 1973, Reddish Egrets have been documented nesting yearly in large colonies on several of the park's isolated manmade and natural islands. During the 2001 colonial waterbird census, 50 pairs of nesting Reddish Egrets were documented on a manmade spoil island located approximately two miles south of the park's northern boundary (TCWD, http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls).

Wintering populations may increase as birds migrate to and from the park.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action area for this project includes 12.5 miles of Gulf beach habitat, which is not preferred by Reddish Egrets. The project area does not include any habitat utilized by the Reddish Egret, which occurs predominately along the Laguna Madre shoreline where the proposed project does not occur.

Direct effects of the proposed project are associated with the vehicular traffic necessary for construction, drilling, and production activities and will occur only within the action area.

NPS DOCUMENT # 582

Heavy equipment and trucks will be traveling along the Gulf beach shoreline to access the drill site located behind the dunes at the 12.5-mile mark. This vehicular traffic will displace Reddish Egrets causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by park visitors are generally seen landing a short distance away and continuing to perform their pre-disturbance behavior.

Therefore, due to Reddish Egrets preferring the Laguna Madre habitat and few numbers being present on the Gulf beach, the potential effect of disturbance from construction, drilling, and production activities to Reddish Egrets is negligible.

No indirect effects of the proposed project are likely to occur.

Conservation Measures:
Vehicular traffic associated with the proposed project is directed to drive above the tide line. This area of the beach is generally farther away from the shorebirds that are found on the Gulf beach including Reddish Egrets. Additionally, vehicles associated with this project are grouped together prior to entering the beach and limited to no more than 15 mph despite a maximum posted speed limit of 25 mph. This should limit the amount of disturbance by limiting the disturbance to fewer instances. For example, instead of five trucks spaced a mile apart and therefore displacing an individual bird five times, the five trucks are grouped together so the individual is displaced only once.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Reddish Egret in either the project or action areas.

White-faced Ibis

Biology and Ecology:
The White-faced Ibis (*Plegadis chihi*) is considered a species of concern at the federal level and listed as threatened by the state.

The range for the White-faced Ibis extends from the western U.S. southward along the Pacific coast to El Salvador, eastward into north and south-central South America, and northward into south Texas (Rappole and Blacklock, 1994).

They are common migrants along coastal plains during late spring and early summer and late summer and early fall. In Texas, these birds are summer residents , breeding on isolated manmade and natural islands along the coast from Galveston to the lower Laguna Madre. This species is uncommon or rare in Texas during the winter.

Their general habitat includes bays, marshes, lakes, and ponds. They feed in freshwater marshes, where they eat insects, worms, and crustaceans (Terres, 1991).

NPS DOCUMENT # 582

The breeding season for the White-faced Ibis is March through July. The White-Face Ibis is considered a colonial nester whose breeding range extends from the western U.S., through south Texas, and into Mexico and Central and South America (Rappole and Blacklock 1994). According to Sibley, these animals nest and roost in trees with other wading birds such as herons and egrets or they may erect nests in bulrushes or reeds (Terres 1991).

The White-faced Ibis is a migratory species occurring at Padre Island National Seashore during the spring and early summer months. This species has been documented nesting on several isolated manmade and natural islands within the Laguna Madre portion of the park. The White-faced Ibis has nested at Padre Island National Seashore since 1973, but have not nested here since 2000 when only two nests were documented (TCWD, http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls). The nesting sites within the park are located approximately 15 miles north of the project area and 2 miles from the action area for this proposed project.

This species has not been documented foraging in the park since its foraging habitat is freshwater marshes, which are not found within the park. In addition, based on four annual surveys (Chaney *et. al.*, 1993a, 1993b, 1995a, 1995b) this species has not been documented resting along the Laguna Madre and Gulf beach shorelines.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does not include nesting, foraging, or resting habitat for the White-faced Ibis. The only park habitat utilized by the White-faced Ibis is located approximately 15 miles from the project area. Therefore, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the White-faced Ibis will occur from this proposed project, no additional conservation measures were developed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the White-faced ibis in either the project or action areas.

Wood Stork

Biology and Ecology:
The Wood Stork (*Mycteria americana*) is not federally listed, but is state listed as threatened. This species is a year round resident in Florida and the coastal areas of Mexico. The Wood Stork occurs in Texas, Louisiana, Alabama, and Mississippi as it migrates into Mexico, Central and South America, and Argentina. It is known to occasionally occur in Georgia, South Carolina, California, and Arizona.

NPS DOCUMENT # 582

Wood Storks forage in freshwater and brackish wetlands, narrow tidal creeks, or flooded tidal pools (USFWS, http://endangered.fws.gov/i/b/sab5z.html). They are often found feeding together with herons and egrets. Non-recreational fish, such as mullet, comprise the bulk of their diet, but they are also known to eat frogs, snakes, young alligators, and insects.

The current Wood Stork population is estimated to be 11,000 adults. Wood Storks nest in large colonies from 30 to several thousand pairs. Nesting habitat consists of cypress or mangrove swamps in Florida, Georgia, and South Carolina (Terres, 1991). This species formerly bred in Texas and most of the Southeastern United States. Breeding generally occurs between fall and winter or spring and early summer depending on the climate and location of the nesting site.

The presence of this species in Texas occurs only when the bird migrates between Florida and the breeding grounds in Mexico and Latin America.

The Wood Stork is a common migrant of Padre and Mustang Islands (Blacklock, 1997). This species is common during the summer and fall seasons (USFWS, 1979). Wood Storks arrive in the coastal bend in June and depart in November with the greatest density generally seen between July and October. Wood Storks are known to forage in estuaries, secondary bays, and freshwater marshes (Blacklock, 1997).

While Wood Storks historically nested in Texas, they have not been documented nesting at Padre Island National Seashore.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does not include nesting, foraging, or resting habitat for the Wood Stork. Therefore, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Wood Stork will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Wood Stork.

Least Tern

Biology and Ecology:
The least tern (*Sterna antillarum)* is the smallest member of the tern family (Nebraska Game and Parks Commission, http://www.ngpc.state.ne.us/wildlife/ltern.html). Only

NPS DOCUMENT# 582

colonies located 50 miles from the coast are considered endangered at the federal level. However, all colonies of Least Terns throughout the state are considered endangered at the state level. They are found along the western and eastern coasts of the United States and from southern Maine to the southern tip of Texas.

Their habitat includes mudflats, beaches, and sandbars (Scott, 1983). Least Terns forage on small fish captured in shallow coastal waters. Fall migration begins mid to late July and continues through early September. Wintering habitat for Least Terns exist along the beaches of Central and South America.

Least Terns are colonial nesters that breed throughout the United States on riverbeds, sandbars, and beaches. Both sexes participate in making the shallow nest scrapes. The female will select a suitable scrape. If the first clutch of eggs is lost, least terns will re-nest up to two times with each re-nesting attempt taking place at a new site. Nesting season begins in spring and ends in early August. Migration from breeding areas to winter grounds usually begins in August and is complete by early September (Nebraska Game and Parks Commission, http://www.ngpc.state.ne.us/wildlife/ltern.html).

Least Terns are present at Padre Island National Seashore seasonally between April and September and utilize the park for foraging, nesting, and migration. During this time, Least Terns are found on both the Gulf beach and Laguna Madre shorelines.

This species utilizes beach habitat from the surf zone to the base of the foredunes, primarily for resting and foraging. Based on surveys in 1993 and 1995, the Least Tern population appears to be stable with 8 birds/mile surveyed (Chaney *et. al.*, 1995b)

Least Terns are colonial nesters that nest on isolated manmade and natural islands in the Laguna Madre. Nesting season generally occurs between April and July and has occurred within the park since 1973 (TCWD, http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls). In 2002, two pairs of Least Terns nested on a manmade island 17 miles north of the project area. Documentation shows that Least Terns generally prefer the Laguna Madre shoreline during June and July possibly for breeding and the Gulf beach shoreline during April, May, August, and September (Chaney *et. al.*, 1995b). Least Terns have not been documented nesting on the Gulf beach.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The project area does not include any habitat utilized by the Least Tern but the action area includes 12.5 miles of Gulf beach habitat that is preferred by this species for foraging and resting.

NPS DOCUMENT # 582

Direct effects of the proposed project are associated with the vehicular traffic necessary for construction, drilling, and production activities and will occur only within the action area.

Heavy equipment and trucks will be traveling along the Gulf beach shoreline to access the drill site located behind the dunes at the 12.5 mile-mark. This vehicular traffic will displace Least Terns causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by park visitors are generally seen landing a short distance away and continuing to perform their pre-disturbance behavior.

No indirect effects of the proposed project are thought to occur.

Conservation Measures:
Vehicular traffic associated with the proposed project is directed to drive above the tide line. This area of the beach is generally farther away from the shorebirds that are found on the Gulf beach including Least Terns. Additionally, vehicles associated with this project are grouped together prior to entering the beach and limited to no more than 15 mph despite a maximum posted speed limit of 25 mph. This should limit the amount of disturbance by limiting the disturbance to fewer instances. For example, instead of five trucks spaced a mile apart and therefore displacing an individual bird five times, the five trucks are grouped together so the individual is displaced only once.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Least Terns in either the project or action areas.

Sooty Tern

Biology and Ecology:
The Sooty Tern (*Sterna fuscata*) is considered a threatened species at the state level.

Sooty Terns are found in tropical and subtropical coasts and islands throughout the world (Rappole and Blacklock, 1994). This species inhabits the offshore waters of the Gulf of Mexico and lower southeast United States coast (Sibley, 2000). This large tern spends nearly all its time in the air over tropical seas but do not perch unless at a nest site.

Sooty Terns feed offshore on small fish that are driven to the surface by predatory fish. They are thought to feed extensively at night. Sooty Terns breed between April and September. A single speckled egg is laid on the ground with no nest prepared. (USFWS, http://www.rl.fws.gov/midway/wildlife/sote.html)

Sooty Terns are rare for Padre Island, but have been documented in the Gulf of Mexico, primary bays, and the Laguna Madre (USFWS, 1979). Sooty Terns are uncommon residents along the central and lower Texas coast between April and August and are

NPS DOCUMENT # 582

rarely observed in March and September (Rappole and Blacklock, 1985 and 1994). If present, this species can be observed flying over marine bays or resting on beaches.

Sooty Terns breed locally between April and July on coastal islands in the Laguna Madre. Between 1985 and 1998, only two nests have been documented within the park. Both of these nests occurred on a manmade rookery island approximately 15 miles north of the project site in the Laguna Madre (TCWD, http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls).

Sooty Terns forage in the coastal waters of Texas feeding almost exclusively on small fish but have been documented feeding on aquatic invertebrates. Based on surveys conducted in 1993 and 1995, no Sooty Terns were observed (Chaney *et. al.*, 1993a, 1993b, 1995a, and 1995b).

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The project area does not include any habitat utilized by the Sooty Tern and the action area includes 12.5 miles of Gulf beach habitat that could be used by this species for foraging and resting. However, due to the rarity of this species occurring at the park, no direct or indirect impact to this species will occur.

Conservation Measures:
Because no potential affects to the Sooty Tern will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Sooty Terns.

Black Tern

Biology and Ecology:
The Black Tern (*Chlidonias niger*) is considered a species of concern at the federal level.

Black Terns inhabit temperate grassland, freshwater lake, freshwater rivers, prairies, lakeshores and marshes with fairly dense cattail or other marsh vegetation and pockets of open water (Null, 1997).

The breeding habitat for Black Terns consists of dead canes of marsh or on floating masses of dead plants. Black Terns breed in north central United States northward into Canada and the Northwest Territories. Sporadic nesting is observed in California, Oregon, and Kansas. Black Terns generally nest in colonies from March to early August.

Wintering habitat is located along the Pacific coast of Mexico, Central and South America and the northern coast of South America. Non-breeding summer habitat

NPS DOCUMENT # 582

consists of marine and coastal areas located along the Gulf of Mexico (Dunn and Agro, 1995).

Black Terns forage on insects such as dragonflies, moths, grasshoppers, and beetles, and freshwater fish when at the breeding grounds. Prey consists of small marine fish including anchovies and silversides, while migrating to and from summer and winter habitat. They are also known to eat crayfish and mollusks.

The Black Tern is a spring and fall migrant and a common summer resident along the Gulf shore of Padre Island National Seashore. No breeding has been documented along the Texas coast (Rappole and Blacklock, 1985)

Black Terns migrate from Padre Island National Seashore to and from their wintering grounds in later summer and early spring respectively. During this time, Black Terns could be found along the Laguna Madre and Gulf beach shorelines throughout the park. In 1994 – 1995, 5,107 Black Terns were documented in the park with three times as many black terns documented along the Laguna Madre than the Gulf beach (Chaney *et. al.*, 1995b). These high totals were found in August during migration, but there were also non-breeding birds counted on the Laguna Madre in July when they were absent on the Gulf Beach (Chaney *et. al.,* 1993a).

Black Terns forage in the coastal waters of Padre Island National Seashore.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The project area does not include any habitat utilized by the Black Tern. The action area includes 12.5 miles of Gulf beach habitat that may be used by Black Terns for foraging and resting.

Direct effects of the proposed project are associated with the vehicular traffic necessary for construction, drilling, and production activities and will occur only within the action area.

Heavy equipment and trucks will be traveling along the Gulf beach shoreline to access the drill site located behind the dunes at the 12.5 mile-mark. This vehicular traffic will displace Black Terns causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by park visitors are generally seen landing a short distance away and continuing to perform their pre-disturbance behavior.

Despite nearly a third of the documented Black Terns occurring within the park, the effects of this project on the Black Tern is minimal given the species reaction to disturbance, the period of time they occur in the park, and the preference for the Laguna Madre habitat.

NPS DOCUMENT # 582

No indirect effects of the proposed project are thought to occur.

Conservation Measures:
Vehicular traffic associated with the proposed project is directed to drive above the tide line. This area of the beach is generally farther away from the shorebirds that are found on the Gulf beach including Black Terns. Additionally, vehicles associated with this project are grouped together prior to entering the beach and limited to no more than 15 mph despite a maximum posted speed limit of 25 mph. This should limit the amount of disturbance by limiting the disturbance to fewer instances. For example, instead of five trucks spaced a mile apart and therefore displacing an individual bird five times, the five trucks are grouped together so the individual is displaced only once.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Black Terns in either the project or action areas.

Piping Plover

Biology and Ecology:
The Piping Plover (*Charadrius melodus*), one of the least common members of the plover family is considered threatened both federally and by the state of Texas. The population is currently estimated to be approximately 1400 pairs (USFWS, http://pipingplover.gws.gov/overview.html).

The Piping Plover is a migratory shorebird, that breeds from Nova Scotia south to North Carolina and winters along the Gulf Coast from Florida to Mexico, along the Atlantic Coast from Florida to North Carolina, and in the Caribbean. They are found on sandy beaches, lakeshores, dunes, and often well above the water line (Sibley, 2000).

Piping Plovers breed along prairie rivers and on alkali wetlands of the Northern Great Plains, sandy beaches along Great Lakes shorelines, and Atlantic coast beaches. These birds nest in shallow depressions built in the sand with both parents incubating the eggs and exhibiting a monogamous mating system. Breeding generally occurs between March and August with both fledglings and parents leaving the nest by September. It is clear that direct interference of nests by vehicles, humans, and dogs significantly affects breeding success (TPWD, http://tpwd.state.tx.us/nature/ending/birds/piplover.htm). Piping Plovers disturbed during nesting by flooding or other disturbance may abandon the nest and establish an additional nest in the vicinity at a new location (USFWS, http://pipingplover.gws.gov/overview.html).

Piping Plovers forage mostly on benthic invertebrates, insects, and crustaceans found within the inter-tidal areas of ocean beaches, wash over areas, mudflats, sand flats, wrack lines, and shorelines of coastal ponds, lagoons or salt marshes. Piping Plovers have been documented defending feeding territories.

NPS DOCUMENT # 582

Piping Plovers have been documented throughout the entire park as a winter resident and fall/spring migrant (Chaney *et. al.*, 1993a, 1993b, 1995a, and 1995b). Piping Plovers are generally found along the Laguna Madre, Gulf beach, and washover channels within the park. Piping Plovers occur at the park 11 months of the year with the exception of February (Chaney *et. al.*, 1993a and 1993b). The highest concentrations of Piping Plovers within the park occur between August and December with September being the month with the highest numbers (Chaney *et. al.*, 1995b).

Padre Island National Seashore protects substantial acreage of wintering habitat for the Piping Plover. The most important area used by Piping Plovers is the broad wind tidal flat located at the north boundary of the park. It is estimated that between 60-65% of all Piping Plovers winter in South Texas (Chaney *et. al.*, 1995a).

In 1992 – 1993, a study documented 602 plovers over the entire 60 miles of south beach with 400 of these being found along the Gulf beach foreshore (Chaney *et. al.*, 1993a). Of the 600 birds observed, 87 Plovers occurred between the zero and twelve-mile mark accounting for nearly 14% of the total number of Plovers counted (Chaney *et. al.*, 1993a). In 1994 – 1995, 150 plovers were documented between the zero and fifteen-mile mark on the Gulf Beach with the majority of these inhabiting the Gulf beach foreshore (Chaney *et. al.*, 1995b).

No nesting has been documented in south Texas or Padre Island National Seashore.

Piping Plovers have been documented foraging on benthic invertebrates and insect larvae along both the Laguna Madre and Gulf beach inter-tidal areas.

Critical Habitat:
No critical habitat has been designated for this species. In 2000, eighty percent of the park was proposed as Piping Plover critical habitat but based on existing NPS regulations, policies, and management measures, no critical habitat was designated.

Potential Effects of Proposed Project:
The project area does not include habitat utilized by the Piping Plover. However, the action area includes 12.5 miles of Gulf beach habitat that is used by this species for foraging and resting. No known nesting habitat exists within the action or project areas.

Direct effects of the proposed project are associated with the vehicular traffic necessary for construction, drilling, and production activities and will occur only within the action area.

Heavy equipment and trucks will be traveling along the Gulf beach shoreline to access the drill site located behind the dunes at the 12.5-mile mark. This vehicular traffic will displace Piping Plover causing them to take flight and either fly along the shoreline to another suitable location or fly offshore. This displacement will be temporary since shorebirds disturbed by park visitors are generally seen landing a short distance away and continuing to perform their pre-disturbance behavior.

NPS DOCUMENT # 582

The proposed project is expected to take place between August and December, which is the time of the year when the highest concentrations of Piping Plovers occur at the park . However based on previous studies, the impact is expected to be minimal. This determination is based on

- Approximately 14% of the total Piping Plovers occurring in the park are likely to be in the action area
- When disturbed, the response by Piping Plovers is to take flight and move along the shoreline to a more suitable area,
- More vehicles are driven daily by the public than the maximum number of vehicles that will be permitted for this project,
- That Piping Plovers migrate to and from both sides of the park depending on available habitat and time of day, and
- No impact to Piping Plover nesting is expected.

Indirect effects of the proposed project may include impacts to benthic invertebrate populations that occur within the inter-tidal area of the Gulf beach. Benthic invertebrates are the primary food source for Piping Plovers. Affects may include changes in interstitial spaces between sand grains necessary for benthic organisms and crushing caused by compaction of the substrate associated with vehicular traffic.

Conservation Measures:

Vehicular traffic associated with the proposed project is directed to drive above the tide line. This area of the beach is generally farther away from the shorebirds that are found on the Gulf beach including Piping Plover and helps reduce impacts to benthic invertebrate populations. Additionally, vehicles associated with this project are grouped together prior to entering the beach and limited to no more than 15 mph despite a maximum posted speed limit of 25 mph. This should limit the amount of disturbance by limiting the disturbance to fewer instances. For example, instead of five trucks spaced a mile apart and therefore displacing an individual bird five times, the five trucks are grouped together so the individual is displaced only once.

Additional conservation measures undertaken by the park include:

- Prohibition on off-road vehicle driving in habitats such as wind tidal flats, which are highly preferred by the species for foraging,
- Conducting inventorying and monitoring of piping plovers through the international shorebird survey, USFWS piping plover survey conducted every five years, and periodic park research projects,
- Submitting funding requests and proposals to allow the park to monitor the plover population within the park and address management concerns,
- Creation of restrictions in timing, placement, and methods of oil and gas development outlined in the park's Oil and Gas Management Plan, and
- Partnering with other state and federal agencies to help ensure that impacts from projects located outside of the park do not impact wind tidal flat habitats that are located within the park.

NPS DOCUMENT # 582

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Piping Plover.

Bald Eagle

Biology and Ecology:
The Bald Eagle (*Haliaeetus leucocephalus*) is listed as threatened at both the state and federal levels. Bald Eagles declined due to a perception that they and other raptors were marauders that killed chickens, lambs, and other domestic livestock. Consequently, farmers, ranchers, and others killed large numbers of Bald Eagles to protect their livestock (USFWS, http://species.fws.gov/bio_eagl.html).

The Bald Eagle is the only eagle that is unique to North America and ranges over most of the continent, from the northern reaches of Alaska, Canada, and Newfoundland south into northern Mexico (USFWS, http://species.fws.gov/bio_eagl.html). Bald Eagles winter throughout its breeding range.

Bald Eagles prefer quiet coastal areas, rivers, or lakeshores with tall trees but can also be found around manmade reservoirs (TPWD, http://tpwd.state.tx.us/nature/ending/birds/baldeagl.htm). Bald Eagles forage primarily on fish, but will feed on almost anything they can catch, including ducks, rodents, snakes, and carrion.

Bald Eagles mate for life and build large nests in the tops of large trees near rivers, lakes, marshes, or other wetland areas. Bald Eagles often re-use nests year after year and normally have one clutch each year (USFWS, http://species.fws.gov/bio_eagl.html).

Bald Eagles range from north, northeast, east, southeast, and central portions of Texas. They are not observed in southwest or western Texas (Rappole and Blacklock, 1994). In Texas, Bald Eagles breed primarily in the northern and eastern portions of the state (TPWD, http://tpwd.state.tx.us/nature/ending/birds/baldeagl.htm). They were formerly common, breeding on the islands in Nueces Bay and elsewhere but are now considered a rare resident (Rappole and Blacklock, 1994). Bald Eagles prefer riparian habitat and oak woodlands (USFWS, 1977).

Bald Eagles have been documented in winter months at Padre Island National Seashore (PAIS, 1999) but are considered rare. They are found in greater abundance on the mainland portion of Texas than the island (McCraken and Clark, 1990). Recent documentation has not identified any Bald Eagles within the park (Chaney *et. al.*, 1993a, 1993b, 1995a, and 1995b). Approximately 0.5 acres of oak woodland and no riparian habitat occur within the park.

Critical Habitat:
No critical habitat has been designated for this species.

NPS DOCUMENT # 582

Potential Effects of Proposed Project:
The action and project areas for this proposed project do include a limited amount of habitat, oak woodland, which could be utilized by the Bald Eagle. However, no known nesting habitat for the Bald Eagle exists in the park and no sightings of a Bald Eagle have occurred in the past 12 years. Therefore, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Bald Eagle will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Bald Eagle.

Northern Aplomado Falcon

Biology and Ecology:
The Northern Aplomado Falcon (*Falco femoralis septentrionalis)* is listed as endangered at both state and federal levels.

This species was extirpated in the United States because of the alteration of grassland habitats by overgrazing, brush invasion, and contamination from pesticides entering the food chain (TPWD, http://www.tpwd.state.tx.us/nature/ending/birds/aplomfal.htm). Historical Ranges include portions of the United States including Arizona, New Mexico, and Texas, Mexico, and Guatemala (USFWS, http://ecos.fws.gov/serlet/SpeciesProfile?spcode=BO6V). The present range of Aplomado Falcons in the United States consists mainly of extreme south Texas.

The Aplomado Falcon was reintroduced in the United States through a project conducted by the Peregrine Fund from which 578 captive bred falcons were released. Two captive-bred adult falcons successfully fledged young in Cameron County, Texas in 1995. The Peregrine Fund has released captive-bred Aplomado Falcons at Laguna Atascosa National Wildlife Refuge, Matagorda Island National Wildlife Refuge, Aransas National Wildlife Refuge, Welder Wildlife Refuge, and the King Ranch.

Results from 2000 indicate that 112 captive-bred falcons were released at eight sites along the Gulf Coast, resulting in 30 confirmed pairs in two core nesting sites, Matagorda Island and Laguna Atascosa National Wildlife Refuge (Peregrine Fund, http://www.peregrine fund.org/conserv_aplomado.html). In Arizona, this species most likely occurred in desert grasslands at relatively low elevations adjacent to shrubby habitats. A reintroduction program may be extended into Arizona and New Mexico in the future (Peregrine Fund, 2002. http://www.peregrinefund.org/conserv_aplo_plans.html).

The primary diet of this species includes mostly small birds and insects caught in flight (Peregrine Fund, http://www.peregrine fund.org/conserv_aplomado.html). Pairs work together to find and flush prey from cover. Aplomado Falcons inhabit open grasslands or

NPS DOCUMENT # 582

savannahs with scattered trees or shrubs (TPWD, http://www.tpwd.state.tx.us/nature/ending/birds/aplomfal.htm), including tall cacti, yuccas and tall pines and oaks in open stands (Peregrine Fund, http://www.peregrinefund.org/conserv_aplomado.html).

Northern Aplomado falcons use old stick nests of other species, which share similar ranges and habitats. Several instances of ground nesting within Cordgrass (*Spartina spp.*) have occurred at Laguna Atascosa. Two are generally laid at different times of the year depending on locality. Historically breeding occurs March to May in the Southwestern United States (Peregrine Fund, http://www.peregrinefund.org/conserv_aplomado.html). This species is not known to migrate.

Over the past ten years, approximately four sightings of individual Northern Aplomado Falcons have occurred in the Park along the main road, beach foredunes, and grasslands of the Northern ten miles of the park. These sporadic sightings generally occurred in winter and early spring. The most recent park sighting of a Northern Aplomado Falcon occurred in December 1999 on the park's northern boundary.

Individuals sighted appear to be transients, and no established adult pairs, territories, or nests have been documented within the park.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging and resting by the Northern Aplomado Falcon. Since this species is transient in nature and rarely occurs at the park, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Northern Aplomado Falcon will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Northern Aplomado Falcon.

Ferruginous Hawk

Biology and Ecology:
The Ferruginous Hawk (*Buteo regalis)* is considered a federal species of concern.

Ferruginous Hawks range from Southeastern Alberta, east to Extreme Southwestern Manitoba, South through the western United States into Northwest and north Central Mexico, and east in the United States to the Central plains (BLM, http://www.id.blm.gov/bopnca/ferrug.htm).

NPS DOCUMENT # 582

Ferruginous Hawks primarily inhabit open, level to rolling, arid to semi-arid grasslands where they feed on small to medium sized mammals, including jackrabbits (*Lepus californicus merriami*) and ground squirrels (*Spermophilus spp.*). Their diet may also include birds and reptiles. The particular prey species depends primarily on availability in any given part of their range. This species is migratory in the northern parts of its range, but can be found year round in the mid and southwestern United States (BLM, http://www.id.blm.gov/bopnca/ferrug.htm).

Ferruginous Hawks prefer to nest in tall trees and can nest on ledges, dirt or rock outcrops, bare ground, and a variety of manmade structures. Nests are typically made from sticks, twigs, and bones and accumulate debris, as they are used year after year. Historically this species bred in Texas but currently nesting is limited to the northwestern Panhandle of Texas. Breeding generally occurs in winter to mid-summer (TPWD, http://www.tpwd.state.tx.us/nature/wild/birds/ferhawk.htm).

The Ferruginous Hawk has been documented within grassland habitats of the park but is considered rare with less than one bird sighted a year. It has only been documented during the winter months (McCraken and Clark, 1990).

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging and resting by the Ferruginous Hawk. Potential effects could include temporary displacement and use of the production facility for perching. However, since this species rarely occurs at the park, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Ferruginous Hawk will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Ferruginous Hawk.

Swallow-tailed Kite

Biology and Ecology:
The Swallow-tailed Kite (*Elanoides forficatus*) is considered a threatened species by the state. This species has only been documented in east Texas in bottomland hardwood forests associated with the Neches, Trinity, and Sabine rivers (Shackelford and Simons, 1999).

NPS DOCUMENT # 582

This species has not been documented at Padre Island National Seashore (McCraken and Clark, 1990).

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does not include habitat that could be used for nesting, foraging, or resting by the Swallow-tailed Kite. Therefore, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Swallow-tailed Kite will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Swallow-tailed Kite in either the project or action areas.

White-tailed Hawk

Biology and Ecology:
The White-tailed Hawk (*Buteo albicaudatus*) is not federally listed but is listed as threatened by the state.

The White-tailed Hawk is a tropical and subtropical species ranging from southern Texas (year round) to Mexico and Central and South America: also some of the islands of the South Caribbean. It's preferred habitat includes open, semi-open, or thinly forested country, whether flat or hilly. In southern Texas, they are most visible in the grassland prairies near the coast, often where there are only scattered bushes, yuccas, or large cacti (Channing, http://www.hawk-conservancy.org/priors/whitetailedhawk.html). White-tailed Hawks are considered common to uncommon in south Texas (Rappole and Blacklock, 1994).

In southern Texas, where rabbits are abundant, White-tailed Hawks feed upon them extensively, although not exclusively. It has been known to take cotton rats, snakes, lizards, frogs, grasshoppers, cicadas, and beetles, and occasionally a quail or other bird. When the wind is favorable, the White-tailed Hawk resorts to hovering while hunting.

Breeding begins late January and usually ends in July (Baicich and Harrison, 1997). This buteo builds a large nest of freshly broken twigs, often thorny ones, mixed with bunches of dry grass and lined with finer material, among which are some green sprays of mesquite or other plants. The nest is added to each year and may become quite large, measuring almost three feet across (Channing, http://www.hawk-conservancy.org/priors/whitetailedhawk.shtml).

NPS DOCUMENT # 582

Within the park, the White-tailed Hawk is common during the winter months and uncommon throughout spring, summer, and fall (McCraken and Clark, 1990).

White-tailed Hawks have been observed in grassland and wind-tidal flat habitats within the park. In 1993, four White-tailed Hawks were seen flying over the wind tidal flats between the 19 and 26-mile mark while 20 birds were observed between Yarborough Pass and the north boundary (Chaney *et. al.*, 1993b and 1995a). White-tailed Hawks have been observed during the fall and winter months within the park. Less than 10% of the White-tailed Hawks documented in 1995 occurred over the Gulf beach habitat while the remaining 90% were seen flying over the wind tidal flats of the Laguna Madre Chaney *et. al.*, 1995b). This indicates that the White-tailed Hawk generally prefers the western portion of the park.

Nesting accounts for White-tailed Hawks are rare. However, a single nest was documented in 2002 in a grassland habitat located 6.5 miles south of the end of Park Road 22. The nest was built in a 6-foot huisache (*Acacia farnesiana*) and appeared to be have been used previously and may indicate that the hawk had been nesting for several years.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for nesting, foraging, or resting by the White-tailed Hawk.

White-tailed Hawks utilize small shrubs and trees for nesting which are not located within or adjacent to the project area. Therefore, no direct effects to White-tailed Hawks will occur from the removal of nesting structure. However, the action area includes Park Road 22, which is used by vehicles accessing the project area. The action area has numerous small shrubs and trees that could be used for nesting but no nests have been documented in this area.

No effects to White-tailed Hawks will occur from oil and gas vehicles traversing the Gulf beach since this species rarely is seen in this habitat. When this species is observed in the Gulf beach habitat, it has been observed flying overhead and not actually perching or foraging.

Activities associated with the construction of the well pad will be conducted in a grassland habitat, which may be utilized by the White-tailed Hawk for foraging. However, since the observation frequency of White-tailed Hawks for the entire park is less than two a month during the winter and a lack of preferred habitat at the project area, it is unlikely that this species will occur at the project area.

Therefore, no direct or indirect effects of the proposed project are likely to occur.

NPS DOCUMENT #- 582

Conservation Measures:
Because no potential affects to the White-tailed Hawk will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the White-tailed Hawk.

Peregrine Falcon

Biology and Ecology:
The Peregrine Falcon (*Falco peregrinus*) has been federally de-listed but is still listed as endangered at the state level. The Peregrine Falcon has nearly worldwide distribution, thriving in a great variety of habitats from artic tundra to tropical rain forests. In North America, this species is best known as inhabitants of canyons and cliffs, though it has been documented to reside amongst the skyscrapers of large cities.

This species predates upon waterbirds but normally does not attack ducks that are sitting on the water. Those individuals who have become city dwellers are most likely attracted to the high populations of Rock Doves (pigeons). They typically feed on Neotropical migrants, waterfowl, and shorebirds while in the area of Padre Island National Seashore.

The Peregrine Falcon is a migratory species that winters along the Gulf of Mexico and as far south as Central and South America. They are known as common winter inhabitants of the southern portion of Padre Island NS, arriving sometime in early fall and departing mid-May (Chaney *et. al.*, 1993a). This falcon is generally only seen twice a year as it migrates through the state in spring and fall (TPWD, http://tpwd.state.tx.us/nature/ending/birds/peregrine.htm).

Peregrines breed in a wide range of habitats including the edge of cliffs, raised mounds on the ground in bare open spaces, in hollow tree stumps, and ledges of large city buildings. Peregrines tend to return to the same site annually. Breeding season begins in early March in the south and mid-May in the north. A single brood of three to four eggs are laid in a hollow scrape with no materials added to it. Females closely tend their young for the first 14 days, but leave them more each day as they grow. The nestlings fly at 35-42 days, but appear to be dependent on the adults for an additional two months.

Peregrine Falcons are an increasingly common migrant, especially in the fall, and a rare winter resident. Peregrine Falcons hunt on broad mudflats and resting on dunes (Chaney *et. al.*, 1995b). These birds are generally concentrated in the southern portion of Padre Island, which is unique in that it is a main component of the migration route, "staging area," particularly for juveniles, during the spring and fall migration (Maechtle, 1993). From actual counts, more than 2,000 Peregrine Falcons utilize this area annually during their fall migration (Maechtle, 1993). The gulf beach is a very important stopover area for refueling, resting, and a landmark guide for many migratory birds (Chaney *et. al.*, 1993a). Padre Island National Seashore and South Padre Island are the only known

NPS DOCUMENT# 582

localities in the Western Hemisphere where Peregrine Falcons can be found in such high concentrations during their spring migration.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging and resting by the Peregrine Falcon. This species commonly perches on structures throughout the park ranging from logs washed onto the beach, trees, shrubs, and manmade structures such as production facilities, radio antennas, and light poles. Since the Peregrine uses these structures for resting, eating its prey, and prey selection, potential effects from this project could include temporary displacement and use of the production facility for perching. In addition, Peregrine Falcons routinely utilize the beach for foraging and therefore could be affected by disturbance caused by vehicles traversing the beach and construction activities associated with the road and pad development.

The effect of the project is expected to be minimal given the seasonal occurrence of the species, the likelihood of Peregrines to return after being displaced, the presence of perching structures where few exist, and the response by raptors to flush or take flight and fly along the shoreline to another suitable location.

Conclusion:
This species is a seasonal resident of the park, utilizing primarily beach and wind tidal flat habitats throughout the entire park. No Peregrine Falcon nesting has been documented within the park. Therefore, Peregrine Falcons are not likely to be affected by this action.

Southwestern Willow Flycatcher

Biology and Ecology:
Southwestern Willow Flycatchers (*Empidonax traillii extimus*) are considered endangered at both the federal and state level.

While the park has documented Willow Flycatchers (*Empidonax traillii*), the southwestern race has not been documented occurring here (McCraken and Clark, 1990).

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does not include habitat that could be used for nesting, foraging, or resting by the Southwestern Willow Flycatcher. Therefore, no direct or indirect effects of the proposed project are likely to occur.

NPS DOCUMENT # 582

Conservation Measures:
Because no potential affects to the Southwestern Willow Flycatcher will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Southwestern Willow Flycatcher.

Cerulean Warbler

Biology and Ecology:
The Cerulean Warbler (*Dendroica cerulea*) is considered a federal species of concern that has shown a continued decline over the past 26 years.

The range for the Cerulean Warbler extends from the central United States, westward to New York, southward into the Gulf coast states, and Mexico (Sibley, 2000). This species is known to occur in Texas as it migrates to its wintering habitat in northern South America. Fall migration begins as early as late July for the Cerulean Warbler (Scott, 1983).

The primary habitat of the Cerulean Warblers includes mature mesic deciduous woodlands, including maple, basswood, and especially oak upland and lowlands or floodplain forest. They are often found near small canopy openings in large continuous forest tracts (Wisconsin). Cerulean Warblers are insectivores whose diet includes bees, wasps, caterpillars, and weevils (Wisconsin)

Cerulean Warblers breed in the eastern U.S., with the exception of the southeastern coastal plains. Breeding takes place in wooded swamps and moist bottomlands where they nest in tall trees. Breeding occurs between mid-May and July (Baicich, 1997). The Cerulean Warbler has never been documented breeding in park.

The Cerulean Warbler is a Neotropical migrant and is not considered a park resident. This species has been documented in grassland and wetland habitats containing black willow (*Salix nigra*) and is considered uncommon in the spring but casual in the fall on Padre and Mustang Islands (USFWS, 1979).

Cerulean Warblers generally arrive at Padre Island National Seashore in March with the greatest densities being observed between April and May during migration to their breeding grounds (USFWS, 1979).

The most recent documented sighting of a Cerulean Warbler occurred in 1995 while the park conducted a mist-netting project near Bird Island Basin (Chaney, 1995). As songbirds migrate northward in the spring, northern weather fronts make it difficult for birds to continue north and cause the birds to "fall out". Birds that fall out remain in the park for one to three days resting and rebuilding their fat reserves before migrating northward again. No Cerulean Warbler breeding has been documented in the park.

NPS DOCUMENT # 582

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging, or resting by the Cerulean Warbler.

Cerulean Warblers utilize trees and small shrubs for foraging and resting during "fall-out" events. However, this vegetation type is not located within or adjacent to the project area and therefore, it is unlikely that this species will be present. However, the action area includes Park Road 22, which is used by vehicles accessing the project area. The action area has numerous trees and small shrubs that could be used for foraging and resting. However, this vegetation type is rarely located within 1,000 feet of Park Road 22 and is unlikely to be disturbed by vehicular traffic.

No effects to Cerulean Warblers will occur from oil and gas vehicles traversing the Gulf beach since this species has not been documented on the Gulf beach.

Activities associated with the construction of the well pad will be conducted in a grassland habitat, which Cerulean Warblers have not been documented using within the park. If a producing well is developed, secondary containment areas located at the well location may periodically hold rainwater or other materials such as condensate or motor oils. Insects may be attracted to the contained water or fluids, which if contaminated and eaten by Cerulean Warblers, could harm this species.

Conservation Measures:
Because potential affects to the Cerulean Warbler could occur from ponded water or other material located at the production facility, all secondary containment will be covered with netting to prevent birds from approaching the fluid. If an emergency occurs from the release of a hydrocarbon, all fluids will be removed using a vacuum truck each day. Additionally, hazardous substances such as condensate, motor oils, or other materials are not allowed to remain in an open container of any kind. These materials will not be left at the production facility and will be removed immediately.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Cerulean Warbler in either the project or action areas

NPS DOCUMENT # 582

Black-capped Vireo

Biology and Ecology:

The Black-capped Vireo (*Vireo atricapillus*) is considered endangered both at the federal and state level. Populations of this species are declining due to the clearing of their breeding habitat for agricultural and grazing activities.

There are two small populations in West central Oklahoma with the largest population on the Lampasas cut plains and the Edwards Plateau in Texas. The population in Mexico is unknown (Travis Audubon Society, http://travisaudubon.org/Endanger/spp.bcv.htm). The wintering range for Black-capped Vireo includes the Pacific coast of Mexico from Sonora to Guerrero in two somewhat disparate habitat types, arid shrubs ranging from three to eighteen foot tall and a diverse, lush more mesic secondary growth forest. These two habitats are similar because they both contain low deciduous vegetation (Texas Tech University, http://www.rw.ttu.edu/sp_accounts/bcvireo/).

Black-capped Vireos prefer habitat that includes semi-open rangelands with scattered clumps of small trees and shrubs separated by open grasslands (TPWD, http://www.rw.ttu.edu/sp_accounts/bcvireo/). These vegetation configurations are the most common in edaphic settings such as eroded gullies, areas with poorer soils, and rocky substrates (Texas Tech University, http://www.rw.ttu.edu/sp_accounts/bcvireo/). This species prefers oak scrub and juniper woodlands in Texas (Rappole and Blacklock, 1994).

The Black-capped Vireo is a highly active feeder that feeds on insects.

Black-capped Vireos leave the wintering grounds and arrive in Texas from late March to mid-April (Travis Audubon Society, http://travisaudubon.org/Endanger/spp.bcv.htm). Males sing to attract mates and to defend territories, which are usually two to four acres in size (TPWD, http://www.rw.ttu.edu/sp_accounts/bcvireo/).

The Black-capped Vireo is a Neotropical migrant and is not considered a park resident. This species has been documented in grassland and wetland habitats containing black willow (*Salix nigra*) and common cane (*Phragmities sp.*).

Black-capped Vireos generally arrive at Padre Island National Seashore during the spring migration and are considered an uncommon species within the park.

The one and only documented sighting of a Black-capped Vireo within the park occurred in the spring of 1997 while the park conducted a mist-netting project near Bird Island Basin (Blacklock *et. al.*, 1997). As songbirds migrate northward in the spring, northern weather fronts make it difficult for birds to continue north and cause the birds to "fall out". Birds that fall out remain in the park for one to three days rebuilding their fat reserves and resting before migrating northward again.

No Black-capped Vireos have been documented breeding in the park.

NPS DOCUMENT # 582

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging, or resting by the Black-capped Vireo.

Black-capped Vireos utilize trees and small shrubs for foraging and resting during "fall-out" events. However, this vegetation type is not located within or adjacent to the project area and therefore, it is unlikely that this species will be present. The action area does include Park Road 22, which is used by vehicles accessing the project area and includes numerous trees and small shrubs that could be used for foraging and resting. However, this vegetation type is rarely located within 1,000 feet of Park Road 22 and is unlikely to be disturbed by vehicular traffic.

No effects to Black-capped Vireos are expected to occur from oil and gas vehicles traversing the Gulf beach since this species has not been documented on the Gulf beach.

Activities associated with the construction of the well pad will be conducted in a grassland habitat, which Black-capped Vireos have not been documented using within the park. If a producing well is developed, secondary containment areas located at the well location may periodically hold rainwater or other materials such as condensate or motor oils. Insects may be attracted to the contained water or fluids, which if contaminated and eaten by Black-capped Vireos, could harm this species.

Conservation Measures:
Because potential affects to the Black-capped Vireo could occur from ponded water or other material located at the production facility, all secondary containment will be covered with netting to prevent birds from approaching the fluid. If an emergency occurs from the release of a hydrocarbon, all fluids will be removed using a vacuum truck each day. Additionally, hazardous substances such as condensate, motor oils, or other materials are not allowed to remain in an open container of any kind. These materials will not be left at the production facility and will be removed immediately.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Black-capped Vireo.

Tropical Parula

Biology and Ecology:
The Tropical Parula (*Parula pitiayumi*) is considered as a species of concern at the federal level.

NPS DOCUMENT # 582

This small tropical American warbler ranges from Mexico to the United States but only into south Texas.

The Tropical Parula lives in low dry woodlands or in semi-dry cultivated valleys with scattered trees. In south Texas, this species utilizes thick woods near edges of lagoons where there is Spanish moss.

This species feeds on larger insects, but other specifics of diet are not well documented. Nesting occurs from south Texas and north Mexico south through Central America to Peru, northern Argentina, and Uruguay.

The Tropical Parula is a Neotropical migrant and is not considered a park resident. This species has been documented in grassland and wetland habitats containing black willow (*Salix nigra*).

Tropical Parula's generally arrive at Padre Island National Seashore during the spring migration. Consequently, Tropical Parula's are not common species.

The one and only documented sighting of a Tropical Parula within the park occurred in the spring of 2001 while the park conducted a mist-netting project near Bird Island Basin. As songbirds migrate northward in the spring, northern weather fronts make it difficult for birds to continue north and cause the birds to "fall out". Birds that fall out remain in the park for one to three days rebuilding their fat reserves before migrating northward again.

No Tropical Parula's have been documented breeding in the park.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does include habitat that could be used for foraging, or resting by the Tropical Parula.

Tropical Parula's utilize trees and small shrubs for foraging and resting during "fall-out" events. However, this vegetation type is not located within or adjacent to the project area and therefore, it is unlikely that this species will be present. However, the action area includes Park Road 22, which is used by vehicles accessing the project area. The action area has numerous trees and small shrubs that could be used for foraging and resting. However, this vegetation type is rarely located within 1,000 feet of Park Road 22 and is unlikely to be disturbed by vehicular traffic.

No effects to Tropical Parula's are expected to occur from oil and gas vehicles traversing the Gulf beach since this species has not been documented on the Gulf beach.

Activities associated with the construction of the well pad will be conducted in a grassland habitat, which Tropical Parula's have not been documented using within the

NPS DOCUMENT # 582

park. If a producing well is developed, secondary containment areas located at the well location may periodically hold rainwater or other materials such as condensate or motor oils. Insects may be attracted to the contained water or fluids, which if contaminated and eaten by Black-capped Vireos, could harm this species.

Conservation Measures:
Because potential affects to the Tropical Parula could occur from ponded water or other material located at the production facility, all secondary containment will be covered with netting to prevent birds from approaching the fluid. If an emergency occurs from the release of a hydrocarbon, all fluids will be removed using a vacuum truck each day. Additionally, hazardous substances such as condensate, motor oils, or other materials are not allowed to remain in an open container of any kind. These materials will not be left at the production facility and will be removed immediately.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Tropical Parula.

Loggerhead Shrike

Biology and Ecology:
The Loggerhead Shrike (*Lanius ludovicianus*) is considered a species of concern at the federal level. All populations within the United States seem to be declining which has been attributed to the loss of habitat.

This species is found throughout most of the United States, Mexico, and south-central Canada. It's wintering range includes the southern United States and into Mexico.

Loggerhead Shrikes prefer open country such as savannas, prairie, and farmland with patches of trees or shrubs present. This species is a permanent resident throughout most of the state but is uncommon to rare in southern Texas (Rappole and Blacklock, 1994).

Shrikes are often found hunting from low perches where they can strike their prey quickly and return to the perch. They do not have talons and kill with a stunning blow from their beaks. They are known for their unique habit of impaling their prey on thorns or barb-wired fences and returning to feed later. Loggerhead Shrikes forage on insects in the summer and mice in winter. This species is solitary except for the breeding season, which begins in early May and continues into mid-July. Nests are constructed of twigs, bark, and other materials and usually found in isolated small trees. Loggerhead Shrikes can produce up to two broods annually.

Loggerhead shrikes commonly occur in park grasslands throughout the park and black willow and small shrub habitats occurring in the northern section of the park. This species is common during the spring, fall, and winter (McCracken and Clark, 1990) and considered rare in summer (Rappole and Blacklock, 1994). In 1997, a Loggerhead shrike was captured and banded in a dune area near Bird Island Basin (Blacklock *et. al.*,

NPS DOCUMENT # 582

1997). There has been no documented nesting of Loggerhead Shrikes at Padre Island National Seashore.

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
Direct effects of the proposed project are those that occur during construction, drilling, and production activities. No direct effects of the proposed project are likely to occur.

The action and project areas for this proposed project does include habitat that could be used for foraging or resting by the Loggerhead Shrike.

Loggerhead Shrikes utilize grasslands with trees and small shrubs for foraging and resting. The project area contains grassland habitats, but no trees or shrubs are present. It is possible that Loggerhead Shrikes present in the project area could be displaced due to activities associated with the construction of the well pad and access road. In addition, the action area includes Park Road 22, which is used by vehicles accessing the project area. The action area has numerous trees and small shrubs that could be used for foraging and resting. However, this vegetation type is rarely located within 1,000 feet of Park Road 22. Increased vehicular traffic on Park Road 22 could have an indirect effect, because of their habit of feeding on grasshoppers and other insects, making Loggerhead Shrikes more susceptible to automobiles.

No effects to Loggerhead Shrikes will occur from oil and gas vehicles traversing the Gulf beach since this species has not been documented on the Gulf beach.

Conservation Measures:
Activities associated with the construction of the well pad will be conducted in a grassland habitat, which Loggerhead Shrikes have been documented using within the park. If a producing well is developed, secondary containment areas located at the well location may periodically hold rainwater or other materials such as condensate or motor oils. Insects may be attracted to the contained water or fluids, which if contaminated and eaten by Loggerhead Shrikes, could harm this species.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Loggerhead Shrike.

Plants

Roughseed Sea-purslane

Biology and Ecology:
Roughseed sea purslane or Texas sea-purslane (*Sesuvium trianthemoides*) is considered federally as a species of concern. Aizoaceae (Carpet-weed) is a very large family, exhibiting considerable diversity of structure. Annual or perennial herbs,

NPS DOCUMENT # 582

succulent or subsucculent, commonly with numerous stems from near the base, often prostrate. This species is apparently endemic to Texas, particularly Kenedy County.

This species is similar to Slender Sea-purslane (*Sesuvium maritimum),* which differs from *S. trianthemoides* in having smooth rather than rugose seeds. Roughseed Sea-purslane is a poorly understood species known only from the type collection. Reports from Aransas and Nueces counties were based on misidentified specimens of *S. maritimum.*

Based on an email from Jason Singhurst of the Texas Parks and Wildlife Department, this species was thought to typically be found in dune habitats in 1966.

Only one documented occurrence of this species has occurred within Padre Island National Seashore. In 1998, this species was documented on a mudflat habitat near the Bird Island Basin area of the park (Nelson, 1997).

Critical Habitat:
No critical habitat has been designated for this species.

Potential Effects of Proposed Project:
The action and project areas for this proposed project does not include habitat for the Roughseed Sea-purslane. Therefore, no direct or indirect effects of the proposed project are likely to occur.

Conservation Measures:
Because no potential affects to the Roughseed Sea-purslane will occur from this proposed project, no additional conservation measures are needed.

Conclusion:
Based on the preceding analysis, the overall conclusion of the Biological Assessment is that the proposed project is not likely to adversely affect the Roughseed Sea-purslane.

14. OTHER CONSIDERATIONS

Park staff, BNP (the oil and gas operator), U.S. Fish and Wildlife Service, and other resource agency representatives have visited the site and/or reviewed the Plan of Operations in order to assure protection of the natural environment and compliance with all laws and regulations.

Site Visit Dates
August 14, 2001 – BNP, Belaire Environmental (BEI), and NPS staff conducted a joint reconnaissance of the three purposed locations. At this time, the areas were walked and the proposed access roads and pad locations were evaluated. Considering the environmental obstacles, the middle site was thought to be the better location.

NPS DOCUMENT # 582

August 15, 2001 – Arlene Wimer, Environmental Protection Specialist at Padre Island National Seashore, returned to the site to take photos and re-evaluated the proposed access road.

August 24, 2001 – BNP, BEI, Arlene Wimer, and Ken McMullen, Chief or Resources Management and Science at Padre Island National Seashore, revisited the site to evaluate habitats involved and to purpose rerouting the access road.

August 28, 2001 – Arlene Wimer and Darrell Echols, Resources Management Specialist at Padre Island National Seashore visited the site to continue evaluating the wildlife habitats of the area.

December 10, 2001 – Arlene Wimer and Pat Clements of the U.S. Fish & Wildlife Service conducted a site visit to become familiar with the project area and identified several concerns:

- The terminal end of the proposed pipeline crossed a wetland area but the original delineation stated that all areas were upland,
- A Corps of Engineer site visit would be required to clarify the wetlands areas, and
- Migratory bird habitat was not an issue.

January 17, 2002 – John Wong and Marie Pattillo of the U.S. Army Corps of Engineers (COE), BEI, and Arlene Wimer conducted a site visit to determine the status of any wetlands involved. The wetland determination concluded that the flow line route would unavoidably cross a small section of wetland habitat. This area would be covered under the Nationwide Permit 12 from the COE and impact less than 0.1 of an acre, which would not require wetland compensation, by the NPS.

15. OVERALL CONCLUSION:

_____ NOT LIKELY TO ADVERSELY AFFECT

_____ MAY AFFECT (Requires Formal USFWS Consultation)

_____ BENEFICIAL EFFECTS

_____ ADVERSE EFFECTS

Comments:

_____

_____

_____

_____

NPS DOCUMENT # 582

Prepared by: Arlene Wimer and Darrell L. Echols, National Park Service, Padre Island National Seashore, PO Box 181300, Corpus Christi, Texas 78480-1300

Telephone: 361-949-8173

16. LITERATURE CITED:

Baccus, J.T. and J.K. Horton. 1979. An Ecological and Sedimentary Study of Padre Island National Seashore. Contract CX7029-7-0059, National Park Service, Santa Fe, New Mexico.

Baicich, P. J. and C.J.O. Harrison. 1997. A Guide to the Nests, Eggs, and Nestlings of North American Birds, Second Edition. Academic Press, San Diego, California 347 pp.

Blacklock, G.W, A.H. Chaney, and S.A. Smith. 1997. Report: Habitat use and species diversity of neotropical bird species during the 1997 spring migration on the Padre Island National Seashore. Ecoservices, Corpus Christi, Texas 92 pp.

Blacklock, G.W. 1997. Birds of Padre and Mustang Island and Adjacent Waters, Annotated Checklist. Welder Wildlife Foundation, Sinton, Texas 140 pp.

Bockstanz, L. "Herps of Texas – Lizards, Phrynosoma cornutum Texas Horned Lizard." November 25, 1998. June 4, 2002.
http://www.zo.utexas.edu/research/txherps/lizards/phrynosoma.cornutum.html

Bureau of Land Management-Idaho. "Ferruginous Hawk (*Buteo regalis*)." May 17, 2002.
http://www.id.blm.gov/bopnca/ferrug.htm

CCWild. "Texas Indigo Snake, Drymarchon corais erebennus." June 4, 2002.
Http://ccwild.cbi.tamucc.edu/naturalhistory/texas_indigo_snake/tisacc.htm

Chaney, A.H. 1988. An Analysis of the Nekton and Plankton Around a Shoalgrass Bed in the Laguna Madre of Texas. Contract PX7490-7-0009, National Park Service, Corpus Christi, Texas.

Chaney, A.H., G.W. Blacklock, and S.G. Bartels. 1993a. Bird Use of the Padre Island National Seashore Gulf Beach from Sept. 1992 – Aug. 1993. Contract 1443PX749092188, National Park Service, Corpus Christi, Texas. 85 pp.

Chaney, A.H., G.W. Blacklock, and S.G. Bartels. 1993b. Laguna Madre Bird Project From Yarborough Pass to Mansfield Channel During July 1992 Through April 1993. Contract 1443PX7000092582, National Park Service, Corpus Christi, Texas. 92 pp.

Chaney, A.H., G.W. Blacklock, and S.G. Bartels. 1995a. Laguna Madre Bird Survey, Yarborough Pass to Northern Boundary, Padre Island National Seashore, August 1994 to August 1995. Contract 1443PX749094190, National Park Service, Corpus Christi, Texas. 93 pp.

NPS DOCUMENT # 582

Chaney, A.H., G.W. Blacklock, and S.G. Bartels. 1995b. Gulf Beach Bird Survey Northern Boundary to Yarborough Pass Padre Island National Seashore Oct. 1994 – Sept. 1995. National Park Service, Corpus Christi, Texas. 152 pp.

Chaney, A.H., G.W. Blacklock, and S.A. Smith. 1998. Habitat Use and Species Diversity of Neotropical Bird Species During the 1998 Spring Migration on Padre Island National Seashore. Ecoservices, Corpus Christi, Texas. 71 pp.

Channing, K. " White-tailed Hawk-*Buteo albicaudatus*." 2002. June 6, 2002. http://www.hawk-conservancy.org/priors/whitetailedhawk.shtml

Ditton, R.B. and J.H. Gramann. 1987. A Survey of Down-Island Visitors and Their Use Patterns at Padre Island National Seashore. National Park Service, Cooperative Park Studies Unit, Texas A & M University, Department of Recreation and Parks, Texas Agricultural Experiment Station, College Station, Texas, Technical Report No. 6. 175 p.

Dunn, Erica and David Agro. "Black Tern." 1995. May 17, 2002. http://www.birdsofna.org/excerpts/blktern.htm

Ernest, R.G., R.E. Martin, and K.A. Duhring. 1998. Beach Driving and Sea Turtles: What Kind of Risk? In: Proceedings of the Seventeenth Annual Symposium on Sea Turtle Biology and Conservation, March 4-8, 1997, Orlando, Florida, p. 50-53. S.P. Epperly and J. Braun (compilers). NOAA Tech. Memo. NMFS-SEFSC-415.

Fletemeyer, J.R. 1996. Guest editorial: The shot heard around the world—Volusia Sea Turtle Suit. Marine Sea Turtle Newsletter 72: 16-17.

Goetze, J.R., A. Nelson, and V. French. 1997. Dynamics of Small Mammal Populations of the Big Ball Hill Region, and Adjacent Areas, of Padre Island National Seashore. Unpublished Report, Laredo Community College, Laredo, Texas. 26 pp.

Hildebrand, H.H. 1963. Hallazgo del area de anidacion de la tortuga marina "lora", *Lepidochelys kempi* (Garman), en la costa occidental del Golfo de Mexico. Ciencia, Mexico 22:105-12.

Hildebrand, H.H. 1981. A historical review of the status of sea turtle populations in the western Gulf of Mexico. In: Biology and Conservation of Sea Turtles, November 26-30, 1979. Washington, D.C., p. 447-453. K. Bjorndal (editor). Smithsonian Institution Press, Washington, D.C.

Hildebrand, H.H. 1983. Random notes on sea turtles in the western Gulf of Mexico. In: Western Gulf of Mexico Sea Turtle Workshop Proceedings, January 13-14, 1983. College Station, Texas, p. 34-40. D. Owens et al. (editors). Texas Sea Grant College Program, TAMU-SG-84-105.

NPS DOCUMENT # 582

Hosier, P.E., M. Kochhar, and V. Thayer. 1981. Off-road vehicle and pedestrian track effects on the s92ea-approach of hatchling loggerhead turtles. Environmental Conservation 8(2): 158-161.

Laine, S.C. and Ramsey III, E.W. 1998. Landcover Classification for Padre Island National Seashore. Department of Interior, U.S. Geological Survey, Layfayette, Louisiana.

Maechtle, T.L. 1993. Padre Island Peregrine Falcon Survey Spring and Autumn 1993. Padre Island National Seashore, Corpus Christi, Texas.

Mann, T.M. 1997. Impact of developed coastline on nesting and hatchling sea turtles in southeastern Florida. Unpublished M.S. Thesis. Florida Atlantic University, Boca Raton.

McCracken, K. and C.T. Clark. 1990. A Checklist of the Birds of Padre Island National Seashore. Southwest Parks and Monuments Association, Tucson, AZ. 4 pp.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991a. Recovery Plan for U.S. Population of Atlantic Green Turtle. National Marine Fisheries Service, Washington, D.C. 52 pp.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991b. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C. 64 pp.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 pp.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, Florida. 52 pp.

Nebraska Game and Parks Commission. "Interior Least Tern an Endangered Species." May 17, 2002. http://www.ngpc.state.ne.us/wildlife/ltern.html

Negrete, I.G., A.D. Nelson, J.R. Goetze, L. Macke, T. Wilburn, and A. Day. 1999. A Checklist for the Vascular Plants of Padre Island National Seashore. SIDA 18(4): 1227-1245.

Nelson, A. 1997. A floristic study of Padre Island National Seashore, Texas with comparisons to other barrier islands along the Texas Coast. National Park Service, Corpus Christi, Texas.

Null, Stephanie. "Black Tern (*Chlidonias niger*)." July 29, 1997. May 17, 2002. http://animaldiversity.ummz.umich.edu/accounts/childonias/c_niger$narrative.html

NPS DOCUMENT # 582

Padre Island National Seashore
2000, Final Oil and Gas Management Plan Environmental Impact Statement.
1971, Checklist of Marine Fish for Padre Island National Seashore.
1999, Checklist of Vegetation for Padre Island National Seashore.
1999, Checklist of Birds for Padre Island National Seashore.

Peregrine Fund. "Northern Aplomado Falcon Restoration" May 17, 2002. http://www.peregrine fund.org/conserv_aplomado.html

Peregrine Fund. "Northern Aplomado Falcon Restoration Future Plans-2000." June 10, 2002. http://www.peregrinefund.org/conserv_aplo_plans.html

Peterson Multimedia Guides, North American Birds. "Brown Pelican." June 6, 2002. http://www.petersononline.com/birds/month/brpe/index.html

Rabalais, N. 1975. Checklist of Mammals of Padre Island National Seashore. Padre Island National Seashore, Corpus Christi, Texas, 2 pp.

Rappole, J.H., and G.W. Blacklock. 1985. Birds of the Coastal Bend, Abundance and Distribution. Texas A&M University Press, College Station 126 pp.

Rappole, J.H., and G.W. Blacklock. 1994. A Field Guide, Birds of Texas. Texas A&M University Press, College Station, Texas 280 pp.

Scott, S.L. 1983. Field Guide to the Birds of North America, Second Edition. National Geographic Society, Washington, D.C. 464 pp.

Shackelford, C.E. and G.G. Simons. 1999. An annual Report of the Swallow-tailed Kite in Texas: A Survey and Monitoring Project for 1998. Texas Parks and Wildlife PWD BK W7000-496 (3/99).

Shaver, D.J. 1984. The Surf Zone Fish Fauna of the Padre Island National Seashore". Published MS Thesis, Texas A&I University, Kingsville, Texas.

Shaver, D.J. 1989. Green sea turtle geographic distribution. Herpetological Review 20(1):14.

Shaver, D.J. 1997. Kemp's ridley turtles from an international project return to Texas to nest. In: Proceedings of the Sixteenth Annual Gulf of Mexico Information Transfer Meeting, December 10-12, 1996, New Orleans, Louisiana, p. 38-40. University of New Orleans, Office of Conference Services (compiler). U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region MMS 97-0038.

Shaver, D.J. 1998a. Kemp's ridley sea turtle nesting on the Texas coast, 1979-1996. In: Proceedings of the Seventeenth Annual Symposium on Sea Turtle Biology and

NPS DOCUMENT # 582

Conservation, March 4-8, 1997, Orlando, Florida, p. 91-94. S.P. Epperly and J. Braun (compilers). NOAA Tech. Memo. NMFS-SEFSC-415.

Shaver, D.J. 1998b. Sea turtle strandings along the Texas coast, 1980-94. In: Characteristics of Texas marine strandings, p. 57-72. R. Zimmerman (editor). NOAA Technical Reports NMFS 143.

Shaver, D.J. 1999a. Kemp's ridley sea turtle project at Padre Island National Seashore, Texas. In: Proceedings of the Seventeenth Annual Gulf of Mexico Information Transfer Meeting, December 16-18, 1997, New Orleans, Louisiana, p. 342-347. M. McKay and J. Nides (editors). U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, MMS 99-042.

Shaver, D.J. 1999b. Padre Island National Seashore Kemp's ridley sea turtle project and sea turtle strandings 1998 report. U.S. Department of the Interior, U.S. Geological Survey. 58 pp.

Shaver, D.J. 2000. Distribution, residency, and seasonal movements of the green sea turtle, Chelonia mydas (Linnaeus, 1758), in Texas. Unpublished Ph.D. Dissertation, Texas A&M University. 273 pp.

Shaver, D.J., and C.W. Caillouet, Jr. 1998. More Kemp's ridley turtles return to south Texas to nest. Marine Turtle Newsletter 82:1-5

Shechter, B. "Alligator mississippiensis, American Alligator." May 2002. May 17, 2002 http://animaldiversity.ummz.umich.edu/accounts/alligator/a._mississippiensis

Sibley, D.A. 2000. National Audubon Society, The Sibley Guide to Birds. Alfred A. Knopf, New York, New York 544 pp.

Singhurst, J. "Information on Sesuvium Trianthemoides." E-mail to Arlene Wimer. June 6, 2002.

Terres, J. T. 1991. The Audubon Society Encyclopedia of North American Birds. Wings Books, New York, New York 1109 pp.

Texas Colonial Waterbird Database. U.S. Fish and Wildlife Service. 2001. June 6, 2002. http://texascoastalprogram.fws.gov/Texas_Colonial_Waterbird_Census_2002.xls

Texas Tech University. "Black-capped Vireo." June 6, 2002. http://www.rw.ttu.edu/sp_accounts/bcvireo/

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Ferruginous Hawk." August 6, 1996. May 16, 2002. http://www.tpwd.state.tx.us/nature/wild/birds/ferhawk.htm

NPS DOCUMENT # 582

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Black-capped Vireo." Sept. 28, 1999. May 17, 2002.
http://tpwd.state.tx.us/nature/ending/birds/bcv.htm

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Brown Pelican." Sept. 28, 1999. May 17, 2002. http://tpwd.state.tx.us/nature/endang/birds/bpelican.htm

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Northern Aplomado Falcon." Sept. 28, 1999. June 10, 2002. http://www.tpwd.state.tx.us/nature/ending/birds/aplomfal.htm

TEXAS PARKS AND WILDLIFE DEPARTMENT." Piping Plover." Sept. 30, 1999. May 17, 2002. http://tpwd.state.tx.us/nature/ending/birds/piplover.htm

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Bald Eagle." March1,2000. May 17, 2002.
http://tpwd.state.tx.us/nature/ending/birds/baldeagl.htm

TEXAS PARKS AND WILDLIFE DEPARTMENT. "Threatened and Endangered Species." Nov. 30, 2001. May 17, 2002. http://tpwd.state.tx.us/nature/endang/

TEXAS PARKS AND WILDLIFE DEPARTMENT. " Peregrine Falcon." April 3, 2002. May 17, 2002.
http://tpwd.state.tx.us/nature/ending/birds/peregrine.htm

Todd, R. "Phrynosoma cornutum, Texas Horned Lizard, Texas Horned Lizard." May 2000. June 4, 2002.
http://animaldiversity.ummz.umich.edu/accounts/phrynosoma/p._cornutum$narrative.html

Travis Audubon Society. "Black-capped Vireo (*Vireo atricapillus*). 2002. May 17, 2002.
http://travisaudubon.org/Endanger/spp.bcv.htm

University of Texas. "Herps of Texas – Snakes, Drymarchon corais erebennus Texas Indigo Snake." January 1, 1999. June 4, 2002.
http://www.zo.utexas.edu/research/txherps/snakes/drymarchon.corais.html

U.S. FISH AND WILDLIFE SERVICE and NATIONAL MARINE FISHERIES SERVICE 1992. Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*). National Marine Fisheries Service, St. Petersburg, Florida. 40 pp.

U.S. FISH AND WILDLIFE SERVICE 1979. A Checklist of Waterbirds of Coastal South Texas. Unpublished Checklist. Slidell, LA. 49 pp.

U.S. F.W.S. 2002. Federally Listed as Threatened and Endangered Species of Texas. U.S. Fish and Wildlife Service, Washington, D.C. 3 pp.

NPS DOCUMENT # 582

U.S. FISH AND WILDLIFE SERVICE "Species Accounts. Wood Stork, Mycteria americana." January 1996. June 7, 2002. http://endangered.fws.gov/i/b/sab5z.html

U.S. FISH AND WILDLIFE SERVICE "Piping Plover Atlantic Coast Population." March 15, 2000. June 7, 2002. http://pipingplover.gws.gov/overview.html

U.S. FISH AND WILDLIFE SERVICE. "Sooty Tern." August 29, 2000. May 17, 2002. http://www.rl.fws.gov/midway/wildlife/sote.html

U.S. FISH AND WILDLIFE SERVICE. "Bald Eagle." Nov.1, 2001. May 17, 2002. http://species.fws.gov/bio_eagl.html

U.S. FISH AND WILDLIFE SERVICE. "Northern Aplomado Falcon." May 17, 2002. http://ecos.fws.gov/serlet/SpeciesProfile?spcode=BO6V

U.S. FISH AND WILDLIFE SERVICE "American alligator, Alligator mississippiensis." May 17, 2002. May 17, 2002 http://ecos.fws.gov/servlet/SpeciesProfile?spcode=C000

NPS DOCUMENT # 582