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**BEACH VEHICLE ENVIRONMENTAL ASSESSMENT**  
**PADRE ISLAND NATIONAL SEASHORE, TEXAS**



**June 2011**



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# BEACH VEHICLE ENVIRONMENTAL ASSESSMENT

## PADRE ISLAND NATIONAL SEASHORE, TEXAS

The National Park Service (NPS) proposes to manage beach driving at Padre Island National Seashore (Seashore) to reduce the risk of injury to Seashore employees and visitors from vehicle accidents, and to improve protection of wildlife (including threatened and endangered species) from potential adverse impacts of beach vehicle use. Over the past two summers, the Seashore temporarily reduced the existing 25 miles per hour (mph) beach driving speed limit to 15 mph during a portion of the summer season to reduce potential resource impacts. This environmental assessment (EA) examines the purpose and need for such actions and assesses the effects of five alternatives for vehicle management on the beach. The alternatives vary primarily by vehicle speed limitations, since vehicle speed was identified by Seashore staff as a primary factor that can affect accident/impact potential and that can also be regulated by the Seashore.

**Alternative 1: No Action.** The no action alternative would result in the continuation of beach driving speed limits prior to the temporary seasonal restrictions implemented during the 2009, 2010 and 2011 turtle nesting seasons. This includes a 15 mph speed limit on North Beach and from mile marker 0 to mile marker 2.5, and a 25 mph speed limit on the beach south of mile marker 2.5 to Mansfield Channel on South Beach. Closed (Malaquite) Beach would remain closed to public vehicle use.

**Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management.** This alternative includes retaining a year-round 15 mph limit on North Beach and from mile marker 0 to 2.5, but with a seasonal 15 mph speed limit for the rest of South Beach from mile marker 2.5 south to Mansfield Channel. This 15 mph limit would begin when the first Kemp’s ridley turtle nest is observed in the Seashore or on April 15 (whichever is earlier), and would continue through the end of the Kemp’s ridley nesting season (defined as 5 days after the last nest has ever been found at the Seashore). Outside of the seasonal restriction period, a safety zone would be implemented from mile marker 2.5 south in which a 15 mph speed limit would be imposed within 100 yards of people, pets, vehicles, structures, flocks of birds, and other wildlife.

**Alternative 3: Longer Seasonal Restrictions (Preferred Alternative).** Under this alternative, longer seasonal restrictions limiting the speed limit to 15 mph from mile marker 2.5 south would last from March 1 through Labor Day (early September). Outside of these dates – day after Labor Day to February 28 – the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph. The year-round 15 mph limit would remain on North Beach and from mile marker 0 to 2.5 on South Beach.

**Alternative 4: Year-round Restrictions.** Under this alternative, a 15 mph speed limit for the entire beach year-round would be implemented, consistent with Texas Transportation Code, Section 545.352, which limits vehicular speed to 15 mph on state beaches.

**Alternative 5: Citizens for Access and Conservation Alternative and Options.** This alternative has two options. The first (Option A) is an alternative as suggested by a citizen’s group (Citizens for Access and Conservation) during public scoping. Under this alternative, the speed limit would remain at 25 mph south of mile marker 2.5 (like the no action alternative), but year-round safety zones would be implemented within 100 feet of people, pets, parked vehicles, and structures, in which the speed limit would be reduced to 15 mph. Under a second option developed from public scoping (Option B) the 15 mph year-round safety zones would apply to driving within 100 feet of wildlife, people, pets, parked vehicles, and structures (i.e., wildlife was added to better meet project objectives, purpose, and need).

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The alternatives were considered for their effects on wildlife (mammals, invertebrates, shorebirds); special-status species (sea turtles and shorebirds); visitor use and experience; visitor and employee safety; Seashore operations and management; and socioeconomics. The analysis determined that none of the proposed alternatives would have major adverse impacts on resources and values at Padre Island National Seashore.

If you wish to comment on the EA, you may mail comments to the name and address below or post comments online at <http://parkplanning.nps.gov/>. This EA will be available for public review for 30 days. Our practice is to make comments, including names, home addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish us to consider withholding this information you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy. Unsupported assertions will not meet this burden. In the absence of exceptional, documentable circumstances, this information will be released. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives of or officials of organizations or businesses, available for public inspection in their entirety.

Please address written comments to:

Superintendent  
Padre Island National Seashore  
Attention: Beach Vehicle EA  
PO Box 181300  
Corpus Christi, TX 78480-1300

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## Acronyms

4WD	4 wheel-drive
CAC	Citizens for Access and Conservation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DHS	Department of Homeland Security
EA	environmental assessment
EIS	environmental impact statement
GLO	General Land Office
mph	miles per hour
MSA	Metropolitan Statistical Area
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPS	National Park Service
PEPC	Planning, Environment, and Public Comment
Seashore	Padre Island National Seashore
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service



# CHAPTER 1: PURPOSE AND NEED

## INTRODUCTION

Padre Island National Seashore (the Seashore) was established by an act of Congress on September 28, 1962, and is managed by the National Park Service (NPS). The Seashore is located on a 113-mile barrier island (North Padre Island), approximately 8 miles southeast of Corpus Christi, Texas (figure 1). The 130,434 acres of the Seashore were set aside as part of the national park system 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” (Public Law 87-712, codified at 16 U.S.C. § 459d).



FIGURE 1. PADRE ISLAND NATIONAL SEASHORE VICINITY MAP

This environmental assessment (EA) examines the effects – both on the natural and human environment – associated with proposed changes to management of vehicles on the Gulf of Mexico (Gulf) beach. The alternative management concepts focus on speed limit, as it was determined that this was a primary variable that could affect the expected risk level related to accidents or impacts and that could be managed and regulated by the Seashore. The impacts of different alternatives on wildlife (including endangered species), visitor use and experience, visitor and employee safety, Seashore management and operations, and socioeconomics within or near Padre Island National Seashore are presented. Separate analyses are presented for implementation of the action alternatives (alternatives 2, 3, 4, and 5) and continued current management (alternative 1, no action) on these resources. Alternative 3 is the preferred alternative. The study area or area of potential effect considered for the analysis includes the Gulf beach and nearby environs that may be affected by beach driving alternatives.

This EA has been prepared in accordance with the *National Environmental Policy Act* (NEPA) of 1969 and implementing regulations, Title 40 of the Code of Federal Regulations (CFR), 1500–1508, and NPS Director’s Order 12 and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making (NPS 2001a).

## PURPOSE OF AND NEED FOR ACTION

Located along the south Texas coast, Padre Island National Seashore protects the largest stretch of undeveloped barrier island in the world (see figure 2).



**FIGURE 2. UNDEVELOPED GULF BEACH AT PADRE ISLAND NATIONAL SEASHORE**

The Seashore provides a wide range of recreational opportunities for fishing, swimming, beachcombing, and beach camping, including access to remote camping and fishing locations along the 65.5 miles of beach stretching south to Mansfield Channel. The Seashore provides habitat to a wide range of organisms, including the endangered Kemp’s ridley sea turtle and

other sea turtles, piping plover, and is globally important for migrating birds. Padre Island National Seashore also protects a rich cultural history, having some of the oldest shipwrecks in the North American continent; the Santa Maria de Yciar, San Esteban, and the Espiritu Santo shipwreck.

Vehicles are permitted on the beach; however, 4 wheel-drive (4WD) vehicles are needed to travel to the more southern (down island) parts of the Seashore (see figure 3).



**FIGURE 3. BEACH DRIVING AT PADRE ISLAND NATIONAL SEASHORE**

The Seashore's Gulf beach is divided into three distinct vehicle use areas: North Beach, Closed (or Malaquite) Beach, and South Beach. North Beach is 1 mile long and extends from the Seashore's northern boundary to a set of bollards marking the northern extent of Closed Beach. Driving and camping are permitted on this section of beach. Closed Beach is a pedestrian-only beach and no visitor vehicles are permitted. Closed Beach extends south of North Beach for 4.5 miles to a set of bollards marking the beginning of South Beach. The Malaquite campground and Malaquite Visitor Center beaches are included in the Closed Beach section. The heavily used portion of South Beach from mile marker 0 south to mile marker 2.5 has a speed limit of 15 miles per hour (mph). The beach speed limit is 25 mph from mile marker 2.5 south to the Mansfield Channel at mile marker 60 (figure 4). Mile marker locations on the Gulf beach are shown in figure 4 below.

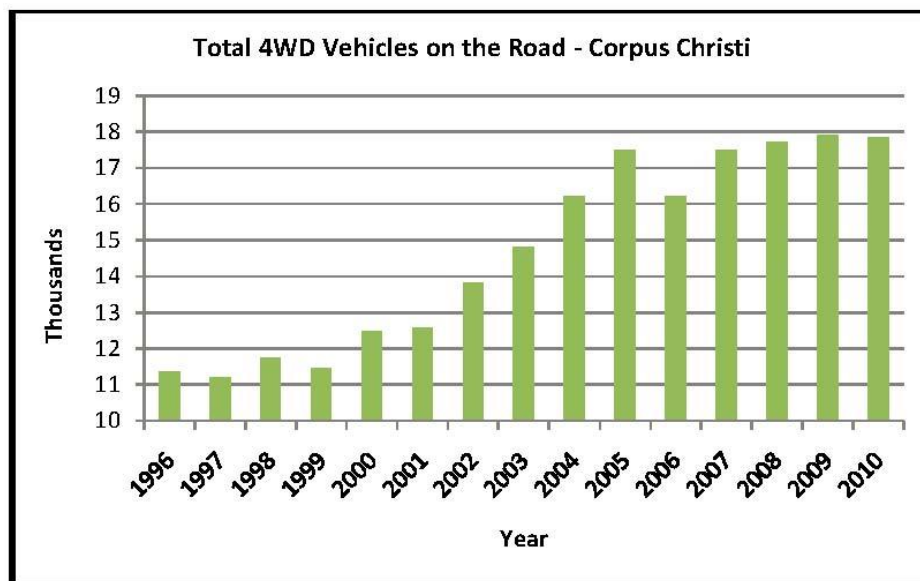




FIGURE 4. PADRE ISLAND NATIONAL SEASHORE WITH BEACH MILE MARKERS



The NPS is considering alternatives to manage beach vehicle use at the Seashore that focus on differences in speed, which is a variable that affects relative risk of impacts and accidents and which the Seashore can control or regulate. The action is needed to reduce current and potential future impacts of vehicle use on visitors, Seashore employees, and wildlife resources on the beach. The original vehicle speed regulations were put into place when the Seashore was established in 1962, when there was limited use of 4WD vehicles. Over the years there has been a change in visitor use patterns. Over the past 10 years, Texas and the Corpus Christi area have seen a dramatic increase in the number of registered 4WD vehicles capable of reaching down island environs via beach driving (figure 5, R.L. Polk and Company 2010). This coincides with observations by Seashore rangers of increased visitation to destinations such as Big Shell Beach (approximately mile marker 18 to 30) and at Mansfield Channel (approximately mile marker 60), as well as increased traffic on the beach associated with the oil and gas industry (NPS 2011d; Shaver 2010e). Because no official vehicle counts are maintained, these are anecdotal observations. As such modes of transportation have become more popular, there is a need to implement management policies that protect both people and wildlife that use the Gulf beach at Padre Island National Seashore.



**FIGURE 5. FOUR-WHEEL-DRIVE VEHICLE REGISTRATION TRENDS IN CORPUS CHRISTI**

The Gulf beach is an important habitat for wildlife, including migratory shorebirds and the highly endangered Kemp's ridley sea turtle as well as four other listed sea turtle species. The number of endangered Kemp's ridley sea turtles nesting on the beach has increased steadily since 2004. The rapidly increasing numbers of this endangered species is good news, but there are also concerns for their safety related to beach nesting and beach driving. Although there are no reports of nesting sea turtles being struck or run over by vehicles at Padre Island National Seashore, these incidents have occurred at other locations (Cape Hatteras National Seashore, Bolivar Peninsula, Matagorda Peninsula, and South Padre Island). Because the number of nesting Kemp's ridley sea turtles has been increasing at the same time as 4WD vehicle use on the beach has increased, it is important to evaluate how existing and proposed beach driving options may impact this species and other wildlife using the beach. An examination of beach driving conditions and vehicle speed alternatives will assist in determining if changes would be appropriate.

Other wildlife species have been struck and injured or killed on the Gulf beach. Among the recorded fatalities are white-tailed deer, coyotes, and shorebirds. Wildlife strikes, especially to large mammals, can also be hazardous to the occupants of vehicles.

With the increased number of vehicles on the beach, there are increasing opportunities for vehicle conflicts. This may include interactions between vehicles, vehicles and people (people often cannot hear vehicles approaching because of the dominance of ocean sounds), vehicles and wildlife, vehicles and debris (including hazardous material), and vehicles and pets. Information is available from 2000 to 2010 for the following accident types: vehicle-vehicle; vehicle-wildlife; vehicle-person; and vehicle-pet accidents. Accidents are classified as injury/non-injury. Accidents average 3 to 4 per year (NPS 2009b); however, these represent minimal estimates, since some accidents are never reported.

Speed, unsafe operations, not paying attention, foolish behavior, and alcohol use are all factors contributing to accidents. Of these, the primary thing the Seashore can control in efforts to provide a safer environment is the speed limit. The Seashore's law enforcement staff receive phone calls two to three times each weekend during high visitation periods from visitors complaining about vehicles speeding and accident near misses (Poulson 2011).

The NPS proposes to reduce the risk of current and potential future impacts of vehicle use on visitors and wildlife on the beach. The need for this action stems from concerns about increased 4WD vehicle use on the beach and the observed and expected effects of that use on the safety of Seashore visitors, Seashore staff and volunteers, and wildlife: including sea turtles, birds, and mammals. Action is needed at this time because conflicting trends have been observed; numbers of visitors and 4WD vehicles on the beach appear to be increasing based on staff observations and trends noted in local 4WD registrations; and there is an increasing number of nesting sea turtles on the beach. Staff observations of incidents, visitor complaints, and trends in increased 4WD use on the beach reflect visitor-vehicle conflicts and accidents that have the potential to increase or become more serious.

## **PURPOSE AND SIGNIFICANCE OF THE SEASHORE**

Padre Island National Seashore was established by an act of Congress on September 28, 1962, (Public Law 87-712) "to save and preserve, for the purposes of public recreation, benefit, and inspiration, a portion of diminishing Seashore of the United States that remains undeveloped."

The significance of the Seashore lies in the unique, undeveloped nature of a natural, ever changing barrier island. The designation as a national Seashore protects a coastal prairie ecosystem, a complex, dynamic dune system, and the Laguna Madre, one of five hypersaline lagoon environments remaining in the world (Tunnell 2002). The location of the island, gulf dynamics, biotic diversity and integrity, lack of development, and easy access make the Seashore an ideal place to study natural communities and species associated with barrier islands.

As the largest stretch of undeveloped barrier island in the world, the Seashore provides rare opportunities in both the Laguna Madre and the Gulf of Mexico for beach recreation such as beachcombing, swimming, picnicking, camping, sunbathing, fishing, and bird and other wildlife watching in a pristine and solitary environment. Bird Island Basin in Laguna Madre is also internationally recognized as one of the best windsurfing areas in the world.

The area, including Laguna Madre, provides important habitat for marine and terrestrial plants and animals, including rare, threatened, and endangered species. The Seashore is the only area on the Texas coast where nests from all five species of sea turtles that occur in the Gulf of Mexico have been documented. Parts of the Seashore in the Gulf of Mexico, Laguna Madre, and Mansfield Channel provide important habitat for these species. The most endangered sea turtle in the world, Kemp's ridley sea turtle, nests more frequently in the area than any other sea turtle species. More Kemp's ridley nests have been found at the Seashore than at any other single location in the United States, making the Seashore the most

important nesting beach for this species in the United States. However, the most-used nesting beaches are in Mexico.

Situated along the Central Flyway, the Seashore is critical for more than 380 documented migratory, over-wintering, and resident bird species. The island is designated as a “Globally Important Bird Area” by the American Bird Conservancy (ABC 2011) and in 2007 the Seashore was recognized as a Site of International Importance by the Western Hemisphere Shorebird Reserve Network, the first NPS unit to receive this designation (WHSRN 2011).

## OBJECTIVES

Objectives are what must be achieved to a large degree for the action to be considered a success. All of the alternatives selected for detailed analysis must meet the project objectives to a large degree and resolve the purpose of and need for action. The following objectives were developed for this project:

- Minimize conflicts between vehicles and visitors
- Increase safety of both visitors and employees in relation to vehicle use
- Protect birds, mammals, sea turtles, and other wildlife from adverse effects of vehicle use on the beach
- Allow for safe vehicle access to North and South Beaches while protecting Seashore resources and visitors
- Ensure infrastructure exists (e.g., signage, handouts, computer technology, etc.) to inform vehicle operators of the rules and regulations regarding vehicle use and potential safety hazards
- Minimize impacts on Seashore management and operations.

## RELATIONSHIP TO LAWS, EXECUTIVE ORDERS, AND POLICIES

### APPLICABLE FEDERAL AND STATE LAWS

#### National Park Service Organic Act of 1916

By enacting the NPS *Organic Act of 1916*, Congress directed the U.S. Department of Interior and the NPS to manage units “to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations” (16 USC 1). Despite this mandate, the *Organic Act* and its amendments afford the NPS latitude when making resource decisions that balance resource preservation and visitor recreation.

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on Seashore resources and values. However, the NPS has discretion to allow impacts on Seashore resources and values when necessary and appropriate to fulfill the purposes of a park (NPS 2006, sec. 1.4.3). While some actions and activities cause impacts, the NPS cannot allow an adverse impact that would constitute impairment of the affected resources and values (NPS 2006). The *Organic Act* prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts (16 USC 1a-1). An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct

and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006).

### **National Environmental Policy Act of 1969, as Amended**

NEPA was passed by Congress in 1969 and took effect on January 1, 1970. This legislation established this country’s environmental policies, including the goal of achieving productive harmony between human beings and the physical environment for present and future generations. It provides the tools to implement these goals by requiring that every federal agency prepare an in-depth study of the impacts of “major federal actions having a significant effect on the environment” and alternatives to those actions and required that each agency make that information an integral part of its decisions. NEPA also requires that agencies make a diligent effort to involve the interested members of the public before they make decisions that affect the environment.

NEPA is implemented through Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508) (CEQ 1978). The NPS has in turn adopted procedures to comply with the act and the CEQ regulations, as found in Director’s Order 12, Conservation Planning, Environmental Impact Analysis, and Decision-making (NPS 2001a), and its accompanying handbook.

### **National Parks Omnibus Management Act of 1998**

The *National Parks Omnibus Management Act* (16 USC 5901 et seq.) underscores NEPA and is fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis should this be the case.

The *National Parks Omnibus Management Act* directs the NPS to obtain scientific and technical information for analysis. The NPS handbook for Director’s Order 12 states if “such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision would be modified to eliminate the action causing the unknown or uncertain impact, or other alternatives would be selected” (NPS 2001a).

### **Redwood National Park Act of 1978, As Amended**

All national park system units are to be managed and protected as parks, whether established as a recreation area, historic site, or any other designation. This act states that the NPS must conduct its actions in a manner that would ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

### **Endangered Species Act of 1973, as Amended**

The *Endangered Species Act* of 1973 (16 USC 1531, et seq.) requires an evaluation of the effects of proposed actions on all federally listed species, including threatened, endangered, and candidate species, and those proposed for listing. It also applies to designated “critical habitat” for those species. The U.S. Fish and Wildlife Service (USFWS) determines if a species needs protection under the *Endangered Species Act* and how that species should be classified. Endangered species are considered to be in danger of extinction throughout all or a significant portion of their range. Threatened species are those likely to become endangered in the foreseeable future. Species proposed for listing are in the process of being

listed. Candidate species are determined to warrant protection and are being considered for listing as endangered or threatened.

In addition to federal species, NPS policy also requires examination of impacts on state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). The Texas Parks and Wildlife Department oversees listing of state species. Species listed as endangered or threatened by the state are defined in the same way as federally endangered and threatened species. The state also designates species of special concern, which have no legal protection.

### **Code of Federal Regulation**

Federal regulations provide guidance on how the Seashore is managed, including 36 CFR 4.21(b) (“The superintendent may designate a different speed limit upon any park road when a speed limit set forth in paragraph (a) of this section is determined to be unreasonable, unsafe or inconsistent with the purposes for which the park area was established.”); and 36 CFR 7.75(g) (“Except where different speed limits are indicated by posted signs or markers, speed of automobiles and other vehicles shall not exceed 25 miles per hour where driving is permitted on the beach.”)

### **Padre Island National Seashore Enabling Act**

In 1962, Congress authorized the Seashore's creation in the Enabling Act, Public Law 87-712, 16 U.S.C. §§ 459d-459d-7, providing that the NPS is to administer the Seashore consistent with the NPS Organic Act, 16 U.S.C. §§ 1, 2–4, except as otherwise provided in the Enabling Act."

## **NATIONAL PARK SERVICE DIRECTIVES AND DIRECTOR'S ORDERS**

### **Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making and Handbook**

NPS Director's Order 12 and its accompanying handbook (NPS 2001a) lay the groundwork for how the NPS complies with NEPA. Director's Order 12 and the handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects.

NPS Director's Order 12 requires impacts on park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision makers to understand the implications of those impacts in the short and long term, cumulatively, and within context, based on understanding and interpretation by resource professionals and specialists. Director's Order 12 also requires an analysis of impairment to park resources and values be made as part of the NEPA document.

### **NPS Management Policies 2006**

NPS *Management Policies 2006* states that the “fundamental purpose” of the national park system is to conserve park resources and values and to provide for the public enjoyment of the parks resources and values to the extent that the resources will be left unimpaired for future generations. Native wildlife is identified as a park resource. NPS *Management Policies 2006* provides general principles for the maintenance of natural resources in the park by “preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur.”

Section 4.4 of *NPS Management Policies 2006*, “Biological Resource Management,” includes policies for management of biological resources including threatened or endangered animals. Section 4.4.1 states that the NPS will successfully maintain native plants and animals by “...minimizing human impacts on native plants, animals, populations, communities, and ecosystems...”; Section 4.4.2.3 addresses consultation per the *Endangered Species Act* and states that the NPS will “...undertake active management programs to ...manage detrimental visitor access...” and “...conduct actions...to address endangered, threatened, proposed, and candidate species.”

Section 8 of *NPS Management Policies 2006*, “Use of the Parks,” addresses various aspects of visitor use and safety. Section 8.1.2 of *NPS Management Policies 2006*, “Process for Determining Appropriate Uses,” provides evaluation factors for determining appropriate uses, and has been previously addressed. Section 8.2.5 addresses visitor safety and states that the NPS will “seek to provide a safe and healthful environment for visitors and employees...” and “strive to identify and prevent injuries from recognizable threats to the safety and health of persons and to the protection of property...”

## **Impairment**

According to *NPS Management Policies 2006*, an action constitutes an impairment when an impact “would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006, sec. 1.4.5). Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact on any park resource or value may constitute impairment, but an impact would be more likely to constitute impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to the opportunity for enjoyment of the park
- Identified as a goal in the park’s general management plan or other relevant NPS planning documents.

In this document, impairment findings are not provided for visitor use and experience, visitor and employee safety, Seashore operations and management, or socioeconomics because impairment findings relate back to park resources and values. These impact areas are not generally considered to be park resources or values according to the *Organic Act*, and cannot be impaired the same way an action can impair park resources and values. A draft impairment determination for the NPS preferred alternative is provided in appendix A of this document. Park resources considered in this determination include wildlife and special-status species.

## **SCOPING PROCESS AND PUBLIC PARTICIPATION**

NEPA regulations require an “early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.” To determine the scope of issues to be analyzed in depth in this plan, meetings were conducted with Seashore staff and the public.

### **INTERNAL AND AGENCY SCOPING**

An internal scoping meeting was held on May 18-19, 2010 with involved Seashore personnel to define the purpose and need for the project, identify objectives, review potential issues and impact topics, gather

information on potential impacts, and identify preliminary alternatives. Agency consultation was discussed. Consultation with the USFWS will be conducted because federally listed threatened and endangered species are present in the study area. During the public scoping process, a scoping letter was sent to the USFWS. Seashore staff also met with USFWS on August 27, 2010 to discuss the potential effects of the proposed action on federally listed species and a biological assessment will be sent to the USFWS as well. The Texas Parks and Wildlife Department, the Texas Historic Commission and the Tonkawa Tribe were also sent scoping letters to ensure that state listed species as well as listed or eligible historic properties and cultural resources are not adversely affected.

## **PUBLIC SCOPING**

The NPS initiated public scoping for the Beach Vehicle EA by issuing a scoping brochure on July 23, 2010. The brochure was sent to a mailing list consisting of 502 recipients and was posted to the NPS Planning, Environment, and Public Comment (PEPC) website. The brochure described the EA process and the preliminary purpose, need, objectives, and alternatives that were developed by the Seashore during internal scoping. In accordance with NEPA and Director's Order 12, the issuance of the scoping brochure began the minimum 30-day requirement for public comment. The public scoping comment period began on July 23, 2010, and was subsequently extended to September 29, 2010, to allow for additional comment and to accommodate a public meeting. On September 14, 2010, a public meeting describing draft project alternatives was held in Corpus Christi, Texas, at the Harte Research Institute from 6:00 pm to 9:00 pm. A meeting notice was published in a local paper and a public notice was posted on the Seashore's website. Seventy-five people signed in to the meeting.

The NPS provided several methods for the community to provide input on the proposed project during the public comment period. Comment sheets were provided at the public meeting. Those attending the meetings were also given a brochure providing additional opportunities to comment on the project including directing comments to the NPS PEPC website at <http://parkplanning.nps.gov/pais/>.

During the comment period, 154 pieces of correspondence were received, containing a total of 387 comments. Comments received were very diverse and represented a wide range of views. A large percentage of respondents (about 18 percent) offered ideas for new alternatives or alternative elements. Other comments posed by a relatively large percentage of respondents included questions on the scientific data used and NEPA issues.

Respondents both supported and opposed the preliminary alternatives that included seasonal reductions in speed. Many respondents supported the no action alternative (retain 25 mph speed limit), but a relatively large number supported year-round reduced speeds or longer seasonal restrictions. Concern was expressed that the reduced speed would result in a lack of beach access. It was also suggested that the Seashore should ban beach driving altogether. Several concerns centered on safety and whether there is a need to reduce speeds given the safety record, while others were concerned about the effects of higher speeds on the safety of Seashore employees and visitors. Questions and concerns were raised about the turtle program, potential beach closures, the NEPA process and possible segmentation of issues under NEPA, the range of alternatives considered, data availability and sufficiency, effects on listed species, effects on visitation and local socioeconomics, enforcement, safety zone distances proposed, and timing for seasonal reduced speeds.

Many respondents offered suggestions for different alternatives or elements and several supported the alternative brought forth by the Citizens for Access and Conservation (CAC). As a result, this alternative has been included for full analysis in this EA.

## IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS

Impact topics for this project have been identified on the basis of public input, federal laws, regulations, and orders; NPS *Management Policies 2006*; and NPS knowledge of resources at Padre Island National Seashore. Impact topics that are carried forward for further analysis in this EA are listed below along with the reasons each impact topic is further analyzed. A limited evaluation explaining why some impact topics are not evaluated in more detail is also presented in a following section.

### VISITOR AND EMPLOYEE SAFETY

Providing and improving for human safety is the primary objectives of this plan. Both Seashore staff and the public raised issues about visitor and employee safety related to beach vehicle speed. Based on staff observations of incidents, visitor complaints, and trends in increased vehicle use on the beach, visitor-vehicle conflicts and accidents have been noted and may increase. In addition, public comment revealed concerns about unsafe conditions for families and pets where vehicles travel at more than 15 mph. However, the public also expressed concerns about driver boredom or inattention, an increased potential for vehicles to become stuck in deep sand at reduced speeds, and timely response to down island accidents and emergency situations. Therefore, visitor and employee safety was carried forward for further analysis.

### WILDLIFE

Vehicle use on the beach can disturb, injure, and cause mortality to shoreline wildlife such as ghost crabs and other invertebrates, shorebirds, and mammals. Passing vehicles may cause animals to relocate from foraging sites, disturb prey species occasionally striking animals. Reducing vehicle speed may have the potential to reduce impacts on wildlife. Therefore, this topic was retained for further analysis.

### SPECIAL-STATUS SPECIES

Improving protection of Seashore resources is a priority of this plan and for the purposes of this analysis, the USFWS and Texas Parks and Wildlife Department were contacted and Seashore resource specialists were consulted to determine those federally and state-listed species that could potentially occur on or near the project area. Those special-status species that occur within the project area and that could be adversely affected by the proposed actions to more than a minor degree were carried forward for further analysis. These include all sea turtle species that nest on the Gulf beach and those birds that frequently use the Gulf beach for resting or foraging. In addition to Kemp's ridley (*Lepidochelys kempii*) and green sea turtles (*Chelonia mydas*), other known threatened, endangered, or species of concern occurring in the project area include loggerhead sea turtle (*Caretta caretta*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), piping plover (*Charadrius melodus*), reddish egret (*Egretta rufescens*), northern aplomado falcon (*Falco femoralis*), eastern brown pelican (*Pelecanus occidentalis*), sooty tern (*Sterna fuscata*), black tern (*Chilidonais niger*), and white-faced ibis (*Plegadis chihi*).

The endangered Kemp's ridley sea turtle nests about four months each year. As the population of Kemp's ridley population increases, due to a successful recovery plan, the potential for vehicle-turtle accidents will rise. As nesting increases, the potential will also increase for vehicles to drive over tracks left in the sand by nesting turtles, thereby making it difficult or impossible for biologists to find and protect their nests. Live green sea turtles wash ashore stranded during various months of the year, and as the juvenile green sea turtle population continues to increase, the potential for vehicle-turtle accidents with stranded juvenile green turtles will also increase. In addition, public comments generated several issues related to driving and turtle protection, including questions about the effectiveness of the proposed speed reduction,



questions about the number of vehicle-related turtle injuries, and the NPS mandate to protect species while providing visitors use and access.

In addition to the above listed species, several other species may be found along the Seashore's Gulf beach; however, the proposed action would have either no or negligible impacts on them; therefore, they are not carried forward for further analysis.

Falcons and raptors, including the American peregrine falcon (*Falco peregrines anatum*), northern aplomado falcon (*Falco femoralis*), merlin (*Falco columbarius*), and crested caracara (*Caracara cheriway*), are all likely to be found along the Gulf beach as they hunt for prey; however, only the northern aplomado falcon is federally listed. The peregrine falcon was recently federally delisted and is scheduled to be removed from the State listing. The northern aplomado falcon is a rare winter inhabitant that can be found within the entire length of the Seashore. During surveys conducted by Seashore staff, this species was typically found on the Gulf beach, perched on a post looking for prey. Vehicles might on occasion displace a resting aplomado falcon from its perch; however, this impact would likely occur at any vehicle speed and would be short-term and negligible, lasting only as long as it takes a vehicle to pass. Therefore, raptors and falcons were not carried forward for further analysis in this EA.

Although not an inhabitant of the Seashore's Gulf beach, the American alligator (*Alligator mississippiensis*), which is federally listed because of its similar appearance to the American crocodile, occasionally washes ashore. Two alligators have been recorded in the Park since 1991. This species typically stays on the beach until Seashore staff can transport it to one of the Seashore's freshwater ponds (Stablein 2010). This species, reaching average lengths of 8 feet in females and 11 feet in males, is large enough to readily see, so vehicle drivers have time to slow down and avoid hitting the animals. Due to the rarity of the species on the beach and the ability to see and avoid them, there would be no effect on the American alligator from the proposed action and therefore, it was not carried forward for further analysis in this EA.

Marine mammals are known to the Seashore's Gulf beach only through the occasional stranding of a species. Strandings typically involve bottlenose dolphins (*Tursiops truncatus*), but pilot whales (*Globicephala melas*), pygmy sperm whales (*Kogia breviceps*), and an infant sperm whale (*Physeter macrocephalus*) have been stranded on the beach (Stablein 2010). Stranded species typically occur near the water's edge. These species are large enough to readily see from a distance, so vehicle drivers have time to slow down and avoid hitting the animals. There would be no effect on marine mammals from the proposed action; therefore, they were not carried forward for further analysis in this EA.

## **VISITOR USE AND EXPERIENCE**

According to NPS *Management Policies 2006*, the enjoyment of Seashore resources and values by people is part of the fundamental purpose of all NPS units (NPS 2006). The NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to all persons. Further, the NPS will provide opportunities for the enjoyment of recreation and leisure activities that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks.

One primary visitor activity is the enjoyment of the beach and its resources. This may include beachcombing, fishing, bird and other wildlife watching, relaxing, and swimming. All down island environments of the Seashore are accessed by driving on the beach. Some users prefer to travel down island to Mansfield Channel, which is located at the south end of the Seashore; however, due to the difficulty of accessing this area, only a small percentage of Seashore visitors frequent this area. Because

the proposed project would potentially change the travel time to down island locations, and could affect visitor expectations, this topic was carried forward for further analysis.

## **SEASHORE OPERATIONS AND MANAGEMENT**

Proposed changes to the beach driving speed limit could require additional support for the Seashore to manage the new requirements. In addition, the effectiveness of any proposed changes would be monitored by the Seashore divisions. These increased efforts could have a measurable effect on Seashore staff and how or where they conduct their work; therefore this topic was carried forward for further analysis.

## **SOCIOECONOMICS**

Some visitors to the Seashore may experience a change in their current activities should new beach driving requirements be implemented. Public comments raised several issues related to socioeconomics and these resulting changes. Among their concerns were potential reductions in visitation and a related concern that this could result in measurable socioeconomic changes for businesses that provide visitor services and amenities. Therefore, this topic was carried forward for further analysis.

A reduction in speed limit would result in some additional travel time for oil and gas operators when accessing wells with regular 4WD vehicles for gauging or other daily operating requirements. However, this would be a minimal increase (e.g., about 45 minutes additional for a round trip to the wells with the longest current access—about 15 miles down the beach), which would be a negligible effect on operating costs for the oil and gas operators. Therefore, this was not analyzed in detail as a socioeconomic impact in this EA.

## **IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS**

Impact topics were dismissed from further evaluation in this EA if they meet the following conditions:

- Resources or values do not exist in the analysis area
- Resources or values would not be affected by the proposed project, or the likelihood of impacts are not reasonably expected
- Through the application of mitigation measures, there would be minor or less effects (i.e., no measurable effects) from the proposed actions, and there is little controversy on the subject or reasons to otherwise include the topic.

The following impact topics were eliminated from further analysis in this EA. A brief rationale for the dismissal of each impact resource or value is provided. If impacts on these resources would occur, they would be no more than negligible, localized, or most likely undetectable.

## **CULTURAL RESOURCES**

### **Historic Structures**

The NPS – as steward of many of America’s most important cultural resources – is charged to preserve historic properties for the enjoyment of present and future generations. According to NPS *Management Policies 2006* and Director’s Order 28, Cultural Resource Management, management decisions and activities throughout the national park system must reflect awareness of the irreplaceable nature of these resources (NPS 2006).

Section 106 of the *National Historic Preservation Act* requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment in the consultation process. The term “historic properties” is defined as any site, district, building, structure, or object eligible or listed in the National Register of Historic Places, which is the nation’s inventory of historic places and the national repository of documentation on property types and their significance. The only historic structure located in the study area is the Wreckage of the Nicaragua. Any change in beach driving requirements would not affect this artifact. However, the Seashore consulted with the Texas state historical preservation office, Texas Historical Commission, for concurrence with the Seashore’s negative findings.

Because the proposed project would not affect any historic structures at the Seashore, the topic of historic structures was dismissed for further analysis.

### **Paleontological Resources**

According to *NPS Management Policies 2006*, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). The proposed project area includes those areas along the beach where visitors and vehicles are currently travelling.

Because the project would not disturb any known paleontological sites, there would be no effect on paleontological resources. Therefore, this topic was dismissed from further analysis in this document.

### **Archeological Resources**

In addition to the *National Historic Preservation Act* and *NPS Management Policies 2006*, NPS Director’s Order 28B, Archeology, affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the national park system. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the national park system reflect a commitment to the conservation of archeological resources as elements of our national heritage.

The proposed project area included the Gulf beach where vehicle travel and visitor use have been occurring since before the Seashore was established. Changes in vehicle speed are not anticipated to disturb archeological sites or lead to inadvertent discoveries. Because the project would not disturb any known archeological sites, there would be no effect on archeological resources, and this topic was dismissed from further analysis in this document.

### **Ethnographic Resources**

NPS Director’s Order 28, Cultural Resource Management, defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. Staff at Padre Island National Seashore have not determined that ethnographic resources are present inside Seashore boundaries. Previous Native American consultation efforts have revealed that no tribe currently considers itself directly affiliated with the Seashore, and therefore the probability that ethnographic resources occur within the Seashore is low. However, the Tonkawa Tribe has expressed interest in Seashore management issues and a consultation letter was sent to the tribe. For these reasons, this impact topic was dismissed from further consideration.

## **Cultural Landscapes**

According to NPS Director's Order 28, Cultural Resource Management, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. A cultural landscape inventory has not been conducted for Padre Island National Seashore. However, because the proposed actions would not result in changes to resources associated with the cultural landscape, no change in the existing cultural landscape would result. For these reasons, this topic was dismissed from further analysis.

## **Museum Collections**

NPS *Management Policies 2006* (NPS 2006), NPS-28, Cultural Resource Management Guidelines (NPS 1998), and Director's Order 77-2, Floodplain Management (NPS 2003) require that a Seashore's irreplaceable museum items, archival materials, photographs, natural and cultural specimens, artifacts, and other collections be protected from threats by natural physical processes, such as flooding. Because the Seashore is within a floodplain none of the collections are physically housed within the Seashore. The Seashore's collections are kept in secure and environmentally sound facilities distributed among different NPS units, and Texas A&M University – College Station. The actions proposed to manage beach driving speeds would have no effect on museum collections, and this topic was dismissed from further evaluation.

## **Wilderness**

There are no areas currently designated or eligible for wilderness designation within Padre Island National Seashore. Therefore, this impact topic was dismissed from further consideration.

## **Vegetation**

According to NPS *Management Policies 2006*, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). The proposed project would continue to allow vehicles to travel north and south at the Seashore in already designated driving lanes. Vegetation is generally not present in the driving zone, being limited to sand dunes and inner-island environments, which would not be affected by a change in management policies as part of this project. Because vegetation would not be affected by the proposed changes in beach vehicle speeds, this topic was dismissed from further analysis.

## **Water Resources**

Beach driving has been occurring on South Beach since before the Seashore was established. Vehicle travel is allowed on the beach between the "swash line" and the fore-dune not in marine waters. Seashore staff have not reported impacts on water quality related to beach driving, as sand is not generally suspended in the water column. In addition, it is unlikely that changes in beach driving speeds would measurably affect the delivery of beach sand to adjacent marine waters. No measurable impacts on water quality are anticipated from the proposed actions. Therefore, this topic was dismissed for further analysis.

## **Floodplains**

Executive Order 11988, Floodplain Management and NPS Director's Order 77-2, Floodplain Management, require the NPS to avoid, where possible, long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, the agency shall

provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities.

Although the Seashore does contain floodplains functions and resources, proposed changes in beach driving speeds would not have measureable effects on these functions or resources. Beach driving would continue within long-established driving areas. There would be no construction or actions that would result in upstream or downstream flooding. Seashore response to flood events and visitor protection would remain unchanged. Therefore, this topic was dismissed from further analysis.

## **Wetlands**

For regulatory purposes under the *Clean Water Act*, the term wetlands means “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.”

Executive Order 11990, Protection of Wetlands, requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the *Clean Water Act* authorizes the U.S. Army Corps of Engineers (USACE) to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in *NPS Management Policies 2006* and Director’s Order 77-1, Wetlands Protection (NPS 2002b), strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with Director’s Order 77-1, Wetlands Protection, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

While the Gulf beach is considered wetland and the proposed project is located within these areas, the implementation of any of the alternatives would not be anticipated to result in measurable impacts on wetlands. Beach driving in long-established routes would continue, and vegetation is generally not present in the driving zone, being limited to sand dunes and inner-island environments, which would not be affected by a change in management policies as part of this project. Because the proposed project would not result in any measurable impacts on wetlands, this topic was dismissed from further analysis.

## **Ecologically Critical Areas**

Padre Island National Seashore does not include any designated ecologically critical areas, wild and scenic rivers, or other unique natural resources, as referenced in the *Wild and Scenic Rivers Act* (16 USC 1271, et seq.), *NPS Management Policies 2006*, 40 CFR 1508.27, or the 62 criteria for designating national natural landmarks. Therefore, this impact topic was dismissed from further consideration.

## **Air Quality**

The *Clean Air Act* of 1963 (42 USC 7401, et seq.) was established to promote the public health and welfare by protecting and enhancing the nation’s air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. Section 118 of the *Clean Air Act* requires a park unit to meet all federal, state, and local air pollution standards. The Seashore is designated as a Class II air quality area under the *Clean Air Act*. A Class II designation by the state of Texas, as authorized by the Prevention of Significant Deterioration provisions of the *Clean Air Act* (EA Engineering, Science, and Technology, Inc. 2003), indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the *Clean Air Act*. Further, the *Clean Air Act* provides

that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. Air quality at the Seashore is protected by allowing limited increases over baseline concentrations of sulfur dioxide, nitrogen oxides, and particulate matter.

Mobile source emissions include highway and non-road vehicles, which affect air quality through the production of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and volatile organic compounds. Vehicle emissions occur from both NPS operated and visitor vehicles.

The implementation of the proposed project may result in a change in the speed vehicles travel on the beach. This change could affect mobile source emissions depending on the speed limit and the use of air conditioners, if moving at a speed low enough that the natural breeze would not be sufficient. There may be some negligible effect on air quality as a result of these changes, however it is not anticipated that these changes would be measurable. The nearly continuous breeze from the Gulf of Mexico quickly moves air from the beach inland, and it is unlikely that these changes would be detectable. Because there would be negligible effects on air quality, this topic was dismissed from further analysis.

### **Soundscape Management**

Director's Order 47, Soundscape Preservation and Noise Management, directs parks to address excessive and inappropriate noise (NPS 2004a). Appropriate sounds are those that are consistent with the Seashore's enabling legislation. The Seashore was established to protect the barrier island from development and to provide recreational uses. Thus, visitor experience is a priority of this Seashore. Currently, manmade noise is created along the Gulf beach by vehicles (and occasionally boats) used by Seashore visitors and employees. Under all of the alternatives, these uses would continue and would affect the soundscape of this somewhat remote Seashore. However, because of the long distance of use along the Gulf Coast, and nearly continuous breeze from the ocean, vehicle noises would not create excessive soundscape effects. Driving noises would occur intermittently during daylight hours. The majority of the Seashore would continue to have a relatively natural soundscape at any given time.

To the majority of beachgoers, a reduction in vehicular speeds from 25 mph to 15 mph would not result in any discernible change in the noise emitted from these vehicles. Additionally, under current regulations the level of background noise from the ocean makes it difficult to hear any vehicle approaching. This would not change with the implementation of the proposed project. Because change would not be discernable, impacts would be negligible, and unacceptable impacts would not occur. Therefore, this topic was dismissed from further analysis.

### **Lightscape Management**

In accordance with NPS *Management Policies 2006*, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). The Seashore strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The National Seashore also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. The visitor center and the existing headquarters facility are the primary sources of light in the National Seashore.

No new permanent lighting would be introduced to the National Seashore as a result of the proposed project. Potential speed limit changes that would increase nighttime driving may have a negligible, temporary effect on the preservation of natural ambient lightscapes. Because these anticipated effects would be negligible, this topic was dismissed from further analysis.

## **Prime and Unique Farmlands**

Prime farmlands have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique agricultural land is land other than prime farmland that is used for production of specific, high-value food and fiber crops. Both categories require that the land be available for farming uses (CEQ 1980). Lands within Padre Island National Seashore are not available for farming and therefore do not meet these definitions. Therefore, this impact topic was dismissed from further consideration.

## **Indian Trust Resources and Sacred Sites**

The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights. No Indian trust resources or sacred sites have been identified at Padre Island National Seashore, so this impact topic was dismissed from further consideration.

## **Environmental Justice**

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Guidelines for implementing this executive order under NEPA are provided by the CEQ (CEQ 1997). According to the U.S. Environmental Protection Agency, environmental justice is

The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The goal of this “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts (USEPA 1998).

There are both minority and low-income populations in the general vicinity of the Seashore. However, environmental justice was dismissed as an impact topic for the following reasons:

- NPS staff actively solicited public participation as part of the planning process and gave equal consideration to input from all persons, regardless of age, race, income status, or other socioeconomic or demographic factors
- Impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income populations or communities
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income populations or communities
- NPS staff does not anticipate that any adverse impacts on public health or the socioeconomic environment would fall appreciably more severely or result in disproportionately high and adverse impacts on minority or low-income populations or communities in the area.

### **Quality of the Built Environment / Urban Quality / Gateway Communities**

Alterations to beach driving speed limits would have no effect on the built environment of the Seashore or its gateway community to the north. Therefore, quality of the built environment was dismissed from further consideration.

### **Energy Efficiency and Conservation Potential**

Under each of the project alternatives, the NPS would continue to implement its policies of reducing costs, eliminating waste, and conserving resources by using energy-efficient and cost-effective practices (NPS 2006), and it would continue to look for energy-saving opportunities in all aspects of Seashore operations. Because the NPS would promote energy efficiency under any of the alternatives, this impact topic was dismissed from further consideration.

### **Natural or Depletable Resource Conservation Potential**

There would be no measurable difference in natural or depletable resource conservation among the alternatives being considered as part of this EA. It is not anticipated that a limited change in beach driving speeds would change depletable fossil fuel use because beach driving would continue on the length of the beach, without changes in access. Therefore, this impact topic was dismissed from further consideration.

### **Climate Change**

Climatologists are unsure about the long-term results of global climate change, but it is clear that the planet is experiencing a warming trend that affects ocean currents, sea levels, polar sea ice, and global weather patterns. Although these changes are likely to affect winter precipitation patterns and amounts in the parks, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. Therefore, the analysis in this document is based on past and current weather patterns, and it is expected that climate change would not affect the actions being considered in this EA. Also, the actions being considered would not affect climate change, since effects of any changes in emissions of greenhouse gases would be negligible (see Air Quality dismissal, above). Therefore, climate change was not included as an impact topic.



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## **CHAPTER 2: ALTERNATIVES**

This chapter describes the alternatives developed to meet the purpose and need described in chapter 1. It also identifies alternatives or actions eliminated from further consideration. The preferred alternative and environmentally preferred alternative are identified. Tables are provided that summarize the important features of the alternatives, their effectiveness in meeting the objectives of the taking action, and the effects of the alternatives.

### **ELEMENTS COMMON TO ALL ALTERNATIVES**

The action alternatives evaluated in this EA propose changes to the speed limit and/or the implementation of “safety zones” on certain parts of the Seashore. The extent to which these actions would occur varies by alternative. However, there are numerous elements that are common to all alternatives, including the no action alternative. The following describes those elements that are common to each of the alternatives evaluated in this EA:

- Beach driving would continue to be permitted 365 days a year, 24 hours per day
- Driving on the dunes would not be permitted
- Vehicles travelling north on the beach have the right of way
- Currently, 15 mph year-round speed limits would remain on North Beach and South Beach to mile marker 2.5
- Closed Beach would remain closed to public vehicles
- The NPS would communicate and educate the public regarding rules and regulations of the Seashore
- Regulations with respect to wildlife harassment or reckless driving would continue to be enforced.

### **ALTERNATIVE 1: NO ACTION**

The no action alternative is defined as the result in the continuation of beach management conditions as they were prior to the temporary seasonal restrictions implemented during the 2009 and 2010 turtle nesting seasons. The no action alternative includes the following components:

- The speed limit on North Beach and from mile marker 0 to mile marker 2.5 would continue to be 15 mph
- The speed limit on the beach south of mile marker 2.5 to Mansfield Channel on South Beach would continue to be 25 mph.

### **ACTION ALTERNATIVES**

The action alternatives would reduce the speed limit in certain parts of the Seashore and/or establish “safety zones” or buffers to protect people, pets, wildlife, and structures. None of the action alternatives include prohibitions on access or beach closures.

## **ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

A seasonal 15 mph speed limit for the full length of South Beach would be implemented under this alternative. Seasonal restrictions would begin when the first Kemp’s ridley sea turtle nest is observed in the Seashore or on April 15, whichever is earlier. The speed limit restriction would continue through the end of the Kemp’s ridley nesting season, which is defined as five days after the last nest has ever been recorded in the Seashore. Based on the latest recorded nest of July 15, the Kemp’s ridley sea turtle nesting season would currently end on July 20. Outside of these dates, the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph.

In addition to the seasonal speed limit restriction, a safety zone speed reduction would be in effect outside of the seasonal restriction period. The zone restrictions would be implemented for those areas within 100 yards of any named hazards including people, pets, vehicles, structures, birds, and other wildlife. A speed limit of 15 mph would be established for those areas within safety zones.

## **ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Under this alternative, longer seasonal restrictions limiting the speed limit to 15 mph would last from March 1 through Labor Day (early September). Outside of these dates – day after Labor Day to February 28 – the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph. This seasonal restriction includes peak visitation periods (March through September, including spring break weeks, Memorial Day, Fourth of July, and Labor Day) and the majority of nesting season for all sea turtle species.

## **ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

A 15 mph speed limit for the entire beach year-round would be implemented under this alternative. The implementation of such would be consistent with Texas Transportation Code, Section 545.352, which limits vehicular speed to 15 mph on state beaches.

## **ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE AND OPTION**

This alternative has been proposed by the CAC. As in the no action alternative, the speed limit would remain at 25 mph past mile marker 2.5. However, two options for safety zones were included for analysis:

- Option A is the alternative exactly as proposed by the CAC. This includes year-round safety zones that would be implemented for those areas within 100 feet of people, pets, parked vehicles, and structures (CAC 2010).
- Option B was developed in response to public input on the CAC alternative. It includes year-round safety zones that would be implemented for those areas within 100 feet of wildlife, people, pets, parked vehicles, and structures (wildlife was added to better meet project objectives, purpose, and need).

## **ALTERNATIVES OR ACTIONS CONSIDERED BUT DISMISSED**

Several alternatives or actions suggested by other agencies or the public were considered but not carried through for further analysis in this EA. Consistent with Section 1502.14 of the CEQ (1978) regulations

for implementing the NEPA, this section identifies those alternatives or alternative elements and presents the reasons they were eliminated.

**Beach Closure (Seasonal or Year-Round): Close the entire beach seasonally to all unauthorized vehicle use during turtle nesting season / busy visitor use periods, or year-round.** These options were dismissed because they would reduce visitor access to most of the beach, which is not in accordance with the Seashore's enabling legislation and does not meet the project's objective to allow for safe recreational (vehicle) access and use island-wide while protecting Seashore resources and visitors.

**Other Speed Limits: Example: Use a 20 mph (or other lower speed limit) from mile marker 2.5 to Mansfield Channel on a year-round basis with 15 mph safety zone.** This type of alternative was dismissed due to its lack of enforceability and prosecution. There is limited ability to discern the difference between 20 mph and 15 mph.

**Corridors: Designate a defined corridor on the beach in which vehicles would be allowed to drive between mile marker 2.5 and Mansfield Channel, with a 25 mph speed limit.** This was dismissed because beach conditions change on a daily basis; therefore, designating a permanent corridor would potentially place vehicles in unsafe driving conditions.

**Water's Edge: Require vehicles to drive along the water's edge between mile marker 2.5 and Mansfield Channel.** Although the sand is hard-packed in this area and makes driving easier, this alternative was dismissed for safety reasons. Topography at the water's edge during various tide levels can prevent vehicle operators from seeing hazards. The water's edge is frequently not accessible in Big Shell.

**South of Big Shell Beach: Implement a year-round 15 mph speed limit from mile marker 2.5 to Big Shell Beach and a year-round 25 mph speed limit from Big Shell Beach to Mansfield Channel.** This was dismissed because it would not adequately protect resources, visitors, or wildlife south of Big Shell Beach.

**Patrol Vehicle Caravan: Use a 15 mph sea turtle patrol vehicle escort program similar to existing oil and gas industry escorts from April through July.** This was dismissed due to safety issues that could occur by making visitors wait for turtle patrol vehicles during periods of bad weather or medical emergencies.

**Permits: Include a permit system for visitors who want to operate a vehicle on the beach in any alternative.** This option was dismissed due to the need to construct additional entrance stations at the beach access points and the lack of staffing.

**Kemp's Ridley Nesting and Restrictions: Reduce the speed limit from 25 mph to 15 mph from mile marker 2.5 to Mansfield Channel on days when Kemp's ridley nesting is reported within the state of Texas and/or on high probability nesting days (high winds).** These options were dismissed due to the inability to adequately inform visitors of the change in speed limit if the visitors were already on the beach.

**Relocate Kemp's ridley sea turtles to other barrier islands, including Matagorda and San Jose.** This alternative was not carried forward because it is outside the scope of this planning process and does not address public safety aspects of the purpose and need. Additionally, the NPS is tasked with protecting resources within Seashore boundaries. Such relocation is not in accordance with NPS Management Policies and the Endangered Species Act and is not physically feasible. Those other islands are less

geologically suitable for turtle nesting, much less used for nesting, and outside the documented historic nesting range for the species.

**Create a road behind the dune line to reach South Beach.** This alternative is outside the scope of this planning process, but will be examined within the on-going General Management Plan revision.

**Public Suggestion: A variation of alternative 3, including the required use of headlights and no decrease in speed limit from 25 mph to 15 mph during daylight hours.** This suggested alternative was dismissed because the use of headlights would not meet the objective of protection of wildlife.

**Public suggestions for additional elements for a proposed alternative: an informational handout given to all Seashore visitors on driving rules and etiquette, mandatory driving class, and a required list of safety items to be kept in every vehicle that travels beyond the 5 mile marker.** These elements were not included for various reasons. The Seashore driving guide has previously provided a list of recommended items for visitors to bring in their vehicles. Once an annual pass is handed out, visitors no longer collect handouts. Currently a sign listing the rules is posted at the point where beach driving begins. An additional large sign is at mile marker 4.5. Mandatory driving classes would be a major expense and classes would need to be held on a daily basis. All alternatives include additional public communication and information.

## THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined as “the alternative that will best promote the national environmental policy expressed in the NEPA, Section 101.” This generally is interpreted to mean the alternative that causes the least adverse effect on physical, biological, and cultural resources. However, the policy also considers beneficial use of the nation’s resources and providing a high standard of living.

Section 101(b) of NEPA identifies six criteria to help determine the environmentally preferred alternative. The act directs that federal actions should

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
4. Preserve important historical, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The five alternatives for beach vehicle management differ in their abilities to fulfill these criteria. Impacts of the alternatives relative to these criteria are described below. A more detailed evaluation of impacts is provided in “Chapter 4: Environmental Consequences.”

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.

As noted in the analysis, alternatives 2, 3, 4, and 5 (option B) provide increased protection for wildlife including listed species at the Seashore through a reduced speed limit and/or safety zones that require a reduction in speed within certain distances of wildlife or other objects. Alternative 4 would provide year-round speed limit reductions that would reduce the chances of striking wildlife such as sea turtles assuming that the driver can see the animal and react by stopping and would offer the greatest level of species protection among the action alternatives. Alternative 4 would fulfill the responsibilities of each generation as trustee of the environment for succeeding generations, by providing the greatest potential for the survival of sensitive species in the long term, while at the same time protecting other resources of the Seashore. Alternatives 2, 3, and 5 (Option B) would fulfill this criterion to a large degree but not as completely as alternative 4, because of greater potential for impacts to sensitive species and other wildlife from vehicles operating at higher speeds or with a shorter distance in which to slow down or stop. Alternative 5 (Option A) would only meet this criterion to a slight degree, as this alternative makes no mention of wildlife in its list of objects requiring a reduction in speed, thereby not providing optimal protection for wildlife and species of concern on the beach.

2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.

All alternatives meet this purpose to some degree because the Seashore is a safe visitor destination that is both esthetically and culturally pleasing. The action alternatives all increase safety by establishing a 15 mph speed limit within the Seashore at various times or providing for a slow-down safety zone, but for most visitors, the establishment of a year-round 15 mph speed limit (alternative 4) may provide the greatest safety and esthetic benefits as there would be a greater chance of stopping or avoiding potential accidents while driving at the slower speed year-round. Alternative 3 would provide safety benefits by establishing speed limit reductions when most visitors are present – all summer, spring break weeks, and major spring/summer holiday weekends (Easter, Memorial Day, July 4<sup>th</sup>, Labor Day), although there would be no speed reduction required the rest of the year. Alternative 2 would only reduce speed during some spring/summer months and the 100 yard safety zone in place throughout the rest of the year would require that the driver recognize a hazard and slow down, which provides a measure of safety and helps with culturally pleasing surroundings for those who do not like vehicles speeding by them. Alternative 5 (both options) would have the driver slow within 100 feet of visitors or other users, but this means again that the driver must recognize a hazard and slow down, which provides a measure of safety and helps with culturally pleasing surroundings for those who do not like vehicles speeding by them, but not to the extent realized under alternative 2 because the safety zone may not be large enough to provide adequate stopping distance or enough time to slow down and avoid accidents. Any reduction of speed under all the action alternatives would reduce the potential for, as well as the perception of, visitor conflict issues. Although actual visitor conflicts may not always happen when these two uses occur in the same area, providing slower vehicle speeds would reduce the potential for conflicts and address the feeling of those who perceive there could be a conflict or other safety issue. Of all the alternatives, alternative 4 would meet this criterion the best, and alternative 5 would meet this criterion to the least degree, as it would have the smallest safety zone and no continuous reduction in speed. Alternatives 2 and 3 would meet this criterion to a large degree, though alternative 3 would be slightly better by establishing a reduced speed limit for the entire peak visitor use season.

3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

All alternatives support the ability to experience a wide range of visitor use opportunities at the Seashore, including vehicular use, recreational fishing, swimming, walking, sunbathing, wildlife watching, and other general beach recreation. However, increased speed could lead to resource degradation or risks to health and safety based on the longer stopping distances that result from higher speeds. Nevertheless, a higher speed limit also results in a reduction in time for accessing the more remote southern parts of the Seashore. Alternatives 5 and 2 allow the greatest amount of time that vehicles can travel at 25 mph; however, they also provide the greatest ability to achieve the widest range of visitor uses along the entire length of the Seashore within a shorter period of time. Alternative 3 balances all parts of this criteria the best by allowing speedier access to a wide range of activities during one half of the year, including the fall fishing season, while providing a consistent and slower speed limit during the times when both numerous visitors and special status species would be expected on the beach. However, it does have some risk during the 25 mph period since there is no safety zone during this time. Alternative 4 provides more protection from undesirable and unintended consequences, but it does reduce the ability to achieve the widest range of beneficial uses of the environment for those visitors desiring to recreate further down island. Therefore, alternative 4 meets this criterion to a large degree due to added protection for sensitive species, but does not meet it at the level of alternative 3 because additional travel time would be required for activities down island. All of the other action alternatives would meet the intent of this criterion to a moderate or large degree. However, alternative 3 would reduce the potential for environmental impacts and visitor conflicts and also allow for less impact on vehicular access to a wide variety of park uses for half the year, and thus meets the intent of this criterion the best.

4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.

Because none of the alternatives would result in more than negligible to minor impacts to cultural or historic resources, these topics were dismissed from further analysis in this EA. All alternatives would preserve important historic and cultural aspects of our national heritage in the long term and would meet this criterion to a large degree. The alternatives that restrict speed for longer periods of time and more consistently (alternatives 3 and 4) meet the element for natural resources to a larger degree than alternatives 2 and 5. As discussed under criteria 1 and 2, due to speed restrictions that are consistent and are continuous for longer periods of time, alternatives 3 and 4 would better protect resources based on a shorter stopping distance at lower speeds. However, the alternatives that incorporate safety zones allowing vehicles to slow down within given distances of certain hazards, including visitors and wildlife (alternatives 2 and 5), support a more diverse user group and support a wider variety of individual choices than alternatives 3 and 4. Because of this balance, alternative 3 best meets this criterion.

5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

Balancing population and resource use under the proposed action would include protecting the resources unimpaired for the enjoyment of present and future generations and providing access for visitors to experience the natural resources of the Seashore. *NPS Management Policies 2006* states that the enjoyment that is contemplated by the *Organic Act* is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided

that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant.

As discussed above, alternatives 3 and 4 would provide more consistent and longer periods of reduced speed allowing for adequate stopping distance during sensitive species prime nesting periods, all of which are expected to benefit the natural resources at the Seashore and would provide an amenity (resources) for visitors to experience. This would permit a high standard of living. All of the alternatives evaluated would allow some level of access to the Seashore that would contribute to the sharing of these amenities. Given this, alternatives 2 and 5 (Option B) would meet this criterion to some degree because they would provide the public access to share these amenities, but would not offer the highest level of protection to natural resources, especially if the population of Kemp's ridley sea turtles continues to increase over time. However, alternatives 2 and 5 would better meet the criterion of a wide sharing of life's amenities relating to sharing certain visitor amenities that are found further down island or that can only be accessed during a limited period of time. Alternative 3 would meet this criterion to a large degree by ensuring a level of protection that would allow the natural resources to remain amenities that contribute to a high standard of living, while providing a level of access to the Seashore beaches that would ensure that the visiting public would be able to share these amenities. Alternatives 2 and 5 would do this to some extent, but do so by relying on the safety zone concept that may not afford as much resource protection and as high a standard of living though increased safety. Alternative 4 does not achieve this balance as well as the other action alternatives.

6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

For reasons discussed above, in varying degrees the action alternatives (alternatives 2, 3, 4, and 5) would enhance the quality of the Seashore's biological and physical resources. Alternative 4 also provides a greater level of protection for these resources than the other alternatives due to the year-round reduction of speed and based on stopping distance. Due to the length of the speed restriction (March 1 through Labor Day) of alternative 3, which encompasses the majority of all critical periods for listed species found on the Gulf beach as well as for other wildlife, alternative 3 meets this criteria to the second greatest degree. The second part of this criterion, "approach the maximum attainable recycling of depletable resources," is less relevant to a beach vehicle plan, as it is geared toward a discussion of "green" building or management practices. There would be no construction related to the no-action alternatives, so this purpose would not apply.

## **SUMMARY**

Based on the above, alternative 3 was identified as the environmentally preferred alternative, as it causes the least adverse effect on physical, biological, and cultural resources while providing for a wide range of beneficial use of the nation's resources and a high standard of living.

## **NATIONAL PARK SERVICE PREFERRED ALTERNATIVE**

To identify the preferred alternative, the NPS conducted a Choosing By Advantages Workshop to evaluate each alternative based on its ability to manage beach driving to prevent the loss of natural resources, management beach driving to improve visitor and staff safety, provide access and the opportunity for visitor to experience the Seashore's unique resources, and to manage beach driving to improve the efficiency and effectiveness of park operations (NPS 2011e). Choosing-by advantages is a decision making process that clearly defines and weighs the advantages of implementing the draft proposed alternatives. Typically, the cost of implementing the alternatives is considered in the decision

making process; however, it was determined that the primary expenses for implementing any of the five alternatives would be minimal and consist of installing speed limit and safety zone signs along the beach. Therefore, costs were not included as a part of the final preferred alternative selection process.

In meeting the identified factors, Alternative 3- Longer Seasonal Restrictions was identified as providing the highest advantages and was selected as the NPS' preferred alternative. Alternative 3 was selected because it provided the best overall advantages in addressing safety and resource issues (by reducing speed limits during high visitation periods when visitor conflicts occur, as well as during the entire sea turtle nesting season), and visitor expectations for travel to down island environments.

Tables 1, 2, and 3 below summarize the main points or elements of each alternative, the ability of the alternatives to meet project objectives, and the impacts of the alternatives on the natural and human environment.



**TABLE 1. SUMMARY OF ALTERNATIVE ELEMENTS – SPEED LIMITS\* AND SAFETY ZONES\*\***

	<b>Alternative 1: No Action</b>	<b>Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management</b>	<b>Alternative 3: Longer Seasonal Restrictions (Preferred Alternative)</b>	<b>Alternative 4: Year-Round Restrictions</b>	<b>Alternative 5: Citizens for Access and Conservation Alternative and Options</b>
<b>SPEED LIMITS</b>					
North Beach	15 mph	15 mph	15 mph	15 mph	15 mph
South Beach:					
MM 0 to 2.5	15 mph	15 mph	15 mph	15 mph	15 mph
MM 2.5 to Mansfield Channel	25 mph	15 mph from first observed Kemp's ridley sea turtle nest or April 15 (whichever earlier) to end of its nesting season -approximately July 20 (about 3 months) 25 mph rest of year reduced to 15 mph in safety zone	15 mph from March 1 to Labor Day (about 6 months) 25 mph rest of year	15 mph	25 mph reduced to 15 mph within safety zone
<b>SAFETY ZONE</b>	None	within 100 yards of people, pets, vehicles, structures, birds, and other wildlife	None	None	Option A – within 100 feet of people, pets, parked vehicles, and structures Option B – same as Option A <u>plus</u> wildlife

\*All speed limits shown are year-round unless otherwise indicated.

\*\*Other elements common to all alternatives are listed at the beginning of “Chapter 2 - Alternatives.”

**TABLE 2. HOW THE ALTERNATIVES MEET THE OBJECTIVES**

<b>Alternative 1: No Action</b>	<b>Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management</b>	<b>Alternative 3: Longer Seasonal Restrictions</b>	<b>Alternative 4: Year-Round Restrictions</b>	<b>Alternative 5: Citizens for Access and Conservation Alternative- Option A</b>	<b>Alternative 5: Citizens for Access and Conservation Alternative- Option B</b>
<b>Minimize conflicts between vehicles and visitors</b>					
Does not meet this objective. Currently, vehicles traveling at higher speeds disrupt some visitors' experience.	Meets this objective. Vehicles would be required to adhere to a 15 mph speed limit three months out of the year and slow to 15 mph when within 100 yards of visitors for the remainder of the year, reducing visitor disruption from speeding vehicles.	Meets this objective to a large degree. Vehicles would be required to adhere to a 15 mph speed limit six months out of the year, during all high use periods, but may not minimize conflicts outside of that time period.	Meets this objective. Vehicles would be required to adhere to a 15 mph speed limit year round, reducing visitor disruption from speeding vehicles at all times.	Meets this objective to some degree. Vehicles would be required to slow to 15 mph when within 100 feet of pedestrians or campsites, which may minimize disruption year round.	Meets this objective to some degree. Vehicles would be required to slow to 15 mph when within 100 feet of pedestrians or campsites, which may minimize disruption year round.
<b>Increase safety of both visitors and employees in relation to vehicle use</b>					
Does not meet this objective. Accident rates would continue as-is along the seashore with no increased safety measure.	Meets this objective to a large degree. Lower speed limits during most high use periods and year round safety zones would be expected to reduce accident rates, especially within the first 20 miles of South Beach. However, safety zones would not be as protective as speed limit reductions during spring and fall high use periods.	Meets this objective to a large degree. Lower speed limits during all high use periods would be expected to reduce accident rates, but there would be no added protection outside of that six month period.	Meets this objective. Lower speed limits year round would be expected to reduce accident rates, especially within the first 20 miles of South Beach.	Meets this objective to some degree. A 100 foot safety buffer year round may not be large enough to provide adequate stopping distance or enough time to slow down and avoid accidents. Accidents involving two moving vehicles would not be reduced since there is no requirement to slow down for moving vehicles.	Meets this objective to some degree. Same as Option A.

Alternative 1: No Action	Alternative 2: Shorter Seasonal Restrictions Combined with "Safety Zone" Management	Alternative 3: Longer Seasonal Restrictions	Alternative 4: Year-Round Restrictions	Alternative 5: Citizens for Access and Conservation Alternative- Option A	Alternative 5: Citizens for Access and Conservation Alternative- Option B
<b>Protect birds, mammals, and sea turtles from adverse effects of vehicle use on the beach</b>					
Does not meet this objective. No additional safeguards would be put into place to avoid animal strikes or provide for sea turtle protection during the nesting season.	Meets this objective to a large degree. A speed limit restriction would be in place during most of the Kemp's ridley sea turtle nesting season and the 100 yard safety zone would help protect birds, mammals, and sea turtles year round, although impacts would still occur and the change in speed would not substantially change expected flushing or bird strikes.	Meets this objective to a large degree. The speed limit reduction would be in place for half the year, encompassing the entire Kemp's ridley nesting/hatching season and most of the nesting/hatching season for the other sea turtles on the Seashore. However, birds and other wildlife are present on the beach year-round.	Meets this objective to a large degree. Speed limit restriction would be in place year-round, but there still would be impacts from disturbance. Better protection than other action alternatives based on shorter stopping distance with reduced speed.	Does not meet this objective. This alternative does not provide any additional protection for birds, mammals, or sea turtles at any point throughout the year.	Meets this objective to some degree. The safety zone under this alternative would provide some protection, but drivers may not be able to avoid animal strikes within the 100 foot safety buffer and would not provide speed limit restrictions during the sea turtle nesting season.
<b>Allow for safe vehicle access to North and South Beaches while protecting park resources and visitors</b>					
Meets this objective to some degree. Visitors can access all of North and South Beach without delays, but vehicle travel would not be as safe as possible. Accidents would continue at the existing rate, and protection for park resources and visitors would not be improved.	Meets this objective. The 3-month reduced speed limit and year round safety zone would be expected to allow access without substantial impacts and with more protection for park resources and visitors. Drivers would experience additional travel times south of mile marker 2.5 during the restriction but not during the remainder of the year.	Meets this objective to a large degree. The 6-month reduced speed limit would be expected to allow access without substantial impacts to most users while adding protection during the peak visitor use season and critical sea turtle nesting periods. Drivers would experience additional travel times south of mile marker 2.5 during the restriction but not during the remainder of the year.	Meets this objective to some degree. Safety and resource protection would be expected to increase year round, and visitors would be able to access the beach south to Mansfield Channel, but may not be able to spend as much time recreating or even make the trip to the Mansfield Channel during a single day.	Meets this objective to a large degree. Driver time further down island including to Mansfield Channel would not be impacted, but the 100 foot safety zone may not provide adequate stopping distance to avoid accidents, though it would provide some level of increased protection. .	Meets this objective to a large degree. Same as Option A.

Alternative 1: No Action	Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management	Alternative 3: Longer Seasonal Restrictions	Alternative 4: Year-Round Restrictions	Alternative 5: Citizens for Access and Conservation Alternative- Option A	Alternative 5: Citizens for Access and Conservation Alternative- Option B
<b>Ensure infrastructure exists (e.g., signage, handouts, computer technology, etc.) to inform vehicle operators of the rules and regulations regarding vehicle use and potential safety hazards</b>					
Meets this objective. Infrastructure to inform vehicle operators is currently in place along the Seashore.	Meets this objective. Infrastructure to inform vehicle operators of the current rules and regulations would continue to be in place under this alternative. However, new large signs would be needed to inform visitors about safety zones.	Meets this objective. Infrastructure to inform vehicle operators of the current rules and regulations would continue to be in place under this alternative.	Meets this objective. Infrastructure to inform vehicle operators of the current rules and regulations would continue to be in place under this alternative.	Meets this objective. Infrastructure to inform vehicle operators of the current rules and regulations would continue to be in place under this alternative. However, new large signs would be needed to inform visitors about safety zones.	Meets this objective. Infrastructure to inform vehicle operators of the current rules and regulations would continue to be in place under this alternative. However, new large signs would be needed to inform visitors about safety zones.
<b>Minimize impacts to seashore management and operations</b>					
Meets this objective. There would be no impact to park management and operations under this alternative.	Meets this objective to some degree. Increased travel time required for staff performing duties down island would impact Seashore operations, but some down island duties could reasonably be scheduled for outside of the reduced speed limit period. There would be adverse impacts due to safety zone training and enforcement.	Meets this objective to a large degree. Increased travel time required for staff performing duties down island would impact Seashore operations, but some down island duties could be scheduled for outside of the reduced speed limit period, but not many and there would be no impacts from safety zone training/enforcement.	Meets this objective to some degree. Increased travel time required for staff performing duties down island would impact Seashore operations year-round. No down island duties could be scheduled around speed limit reductions. However, there would be no impacts from safety zone training/enforcement.	Meets this objective to a large degree. Impacts would be minimized, with a negligible increase in travel time for Seashore duties required down island. However, there would be adverse impacts due to safety zone training and enforcement.	Meets this objective to a large degree. Same as Option A.

TABLE 3. SUMMARY OF IMPACTS OF THE ALTERNATIVES

	Alternative 1: No Action	Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management	Alternative 3: Longer Seasonal Restrictions (Preferred Alternative)	Alternative 4: Year-Round Restrictions	Alternative 5: Citizens for Access and Conservation Alternative and Options
Visitor and Employee Safety	<p><u>Direct/indirect</u>: long-term negligible to minor adverse impacts.</p> <p><u>Cumulative</u>: long-term negligible adverse impacts.</p>	<p><u>Direct/indirect</u>: long-term beneficial impacts and potential long-term minor adverse impacts if lower speed causes vehicles to get stuck in the sand.</p> <p><u>Cumulative</u>: long-term beneficial impacts.</p>	<p><u>Direct/Indirect</u>: same as alternative 2, but slightly more beneficial due to slower speeds during peak visitation periods.</p> <p><u>Cumulative</u>: same as alternative 2.</p>	<p><u>Direct/indirect</u>: long-term beneficial and potential long-term minor adverse. More beneficial than under alternatives 2 or 3 due to safety at slower speeds year-round.</p> <p><u>Cumulative</u>: same as alternative 2.</p>	<p><u>Direct/indirect</u>: both options - long-term beneficial impacts, less than under alternatives 2, 3 or 4.</p> <p><u>Cumulative</u>: same as alternative 2.</p>
Wildlife (Mammals, Beach Invertebrates, and Birds)	<p><u>Direct/indirect</u>: short- and long-term negligible to minor adverse impacts.</p> <p><u>Cumulative</u>: long-term minor adverse impacts.</p>	<p><u>Direct/indirect</u>: essentially same as alternative 1, since flushing/disruption and invertebrate impacts would occur regardless of speed; slight benefits for mammals and birds from reduced speed.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 2.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 2.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: Option A – same as alternative 1 Option B – same as alternative 2.</p> <p><u>Cumulative</u>: both options – same as alternative 1.</p>
Special-status Species: Sea Turtles	<p><u>Direct/indirect</u>: long-term minor adverse impacts, up to long-term moderate adverse impacts if sea turtle populations increase.</p> <p><u>Cumulative</u>: long-term beneficial impacts, due primarily to sea turtle rescue program.</p>	<p><u>Direct/indirect</u>: long-term beneficial impacts, with increasing beneficial impacts if sea turtle populations increase.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 2 with slightly more benefits due to longer restriction period.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 3.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: Option A – same as alternative 1 Option B – long-term beneficial impacts, less than expected under other action alternatives due to no overall reduction in speed and smaller safety zone.</p> <p><u>Cumulative</u>: both options – same as alternative 1.</p>

	<b>Alternative 1: No Action</b>	<b>Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management</b>	<b>Alternative 3: Longer Seasonal Restrictions (Preferred Alternative)</b>	<b>Alternative 4: Year-Round Restrictions</b>	<b>Alternative 5: Citizens for Access and Conservation Alternative and Options</b>
Special-status Species: Birds	<u>Direct/indirect</u> : short- and long-term minor adverse impacts.  <u>Cumulative</u> : long-term minor adverse impacts.	<u>Direct/indirect</u> : short- and long-term negligible to minor adverse impacts; only slight benefits compared to alternative 1 since flushing/disturbance would occur regardless of speed.  <u>Cumulative</u> : same as alternative 1.	<u>Direct/indirect</u> : same as alternative 2.  <u>Cumulative</u> : same as alternative 1.	<u>Direct/indirect</u> : same as alternative 2.  <u>Cumulative</u> : same as alternative 1.	<u>Direct/indirect</u> : Option A – Same as alternative 1 Option B – same as alternative 2.  <u>Cumulative</u> : both options – same as alternative 1.
Visitor Use and Experience	<u>Direct/indirect</u> : no impacts.  <u>Cumulative</u> : no cumulative impacts.	<u>Direct/indirect</u> : long-term negligible to minor adverse impacts (moderate adverse during reduced speed season to small segment of visitors due to increased travel time down island); long-term benefits to those concerned with speeding vehicles.  <u>Cumulative</u> : long-term beneficial impacts.	<u>Direct/indirect</u> : same as alternative 2.  <u>Cumulative</u> : same as alternative 2.	<u>Direct/indirect</u> : long-term negligible to moderate adverse impacts (year-round reduced speed); long-term benefits to those concerned with speeding vehicles.  <u>Cumulative</u> : long-term negligible adverse impacts.	<u>Direct/indirect</u> : both options – long-term negligible adverse impacts; long-term benefits to those concerned with speeding vehicles.  <u>Cumulative</u> : both options – same as alternative 2.
Seashore Operations and Management	<u>Direct/indirect</u> : no impacts.  <u>Cumulative</u> : no cumulative impacts.	<u>Direct/indirect</u> : short- and long-term negligible to moderate adverse impacts (effects on travel time for duties and for enforcement of safety zone).  <u>Cumulative</u> : long-term minor adverse impacts.	<u>Direct/indirect</u> : same as alternative 2, but less effect related to enforcement; more time for performing duties requiring travel.  <u>Cumulative</u> : same as alternative 2.	<u>Direct/indirect</u> : long-term moderate adverse impacts, mainly due to increased travel times.  <u>Cumulative</u> : long-term moderate adverse impacts.	<u>Direct/indirect</u> : both options – short-term minor and long-term negligible adverse impacts.  <u>Cumulative</u> : both options- long-term negligible adverse impacts.

	<b>Alternative 1: No Action</b>	<b>Alternative 2: Shorter Seasonal Restrictions Combined with “Safety Zone” Management</b>	<b>Alternative 3: Longer Seasonal Restrictions (Preferred Alternative)</b>	<b>Alternative 4: Year-Round Restrictions</b>	<b>Alternative 5: Citizens for Access and Conservation Alternative and Options</b>
Socioeconomics	<p><u>Direct/indirect</u>: short- and long-term beneficial impacts.</p> <p><u>Cumulative</u>: long-term beneficial impacts (subject to national economic conditions).</p>	<p><u>Direct/indirect</u>: same as alternative 1; may be a very slight change in visitation, but not anticipated to result in any discernible change in economic activity.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 2.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: same as alternative 2; any change in would be slightly greater than under alternatives 2 and 3, but so slight that beneficial effects would remain unchanged.</p> <p><u>Cumulative</u>: same as alternative 1.</p>	<p><u>Direct/indirect</u>: both options - same as alternative 1.</p> <p><u>Cumulative</u>: both options - same as alternative 1.</p>

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## CHAPTER 3: AFFECTED ENVIRONMENT

The Affected Environment describes the existing conditions of visitor and employee safety, Seashore resources (wildlife, special-status species), visitor use and experience, Seashore operations and management, and socioeconomics that could be affected by management actions proposed under this plan.

### VISITOR AND EMPLOYEE SAFETY

Padre Island National Seashore receives approximately 600,000 to 700,000 visitors annually (NPS 2010b). The beaches are open 365 days a year unless closed by the superintendent due to an emergency. Seashore personnel are present throughout the year to respond to the safety needs of staff and visitors. The health and safety of park visitors, staff, and neighbors are of great importance to the NPS.

Human safety is the highest priority for Padre Island National Seashore. Table 4 provides details for health and safety incidents recorded by the Seashore from calendar years 2007 through 2010. These reflect only incidents reported; some incidents are not reported. Additionally, in 2007 there was one employee fatality after an all-terrain vehicle rolled over. Since the employee was alone at the time, the cause of the rollover is unknown.

**TABLE 4. PARK HEALTH AND SAFETY INCIDENTS (2007 TO 2010)**

Incident Totals				
Type of Incident	2007	2008	2009	2010
Vehicle incidents other than DUI, including accidents and traffic violations. (South Beach Only)	42	24	47	77
Search and rescue operations.	0	5	1	6
Emergency medical services incidents, including trauma, medical, and first aid only.	93	96	93	60

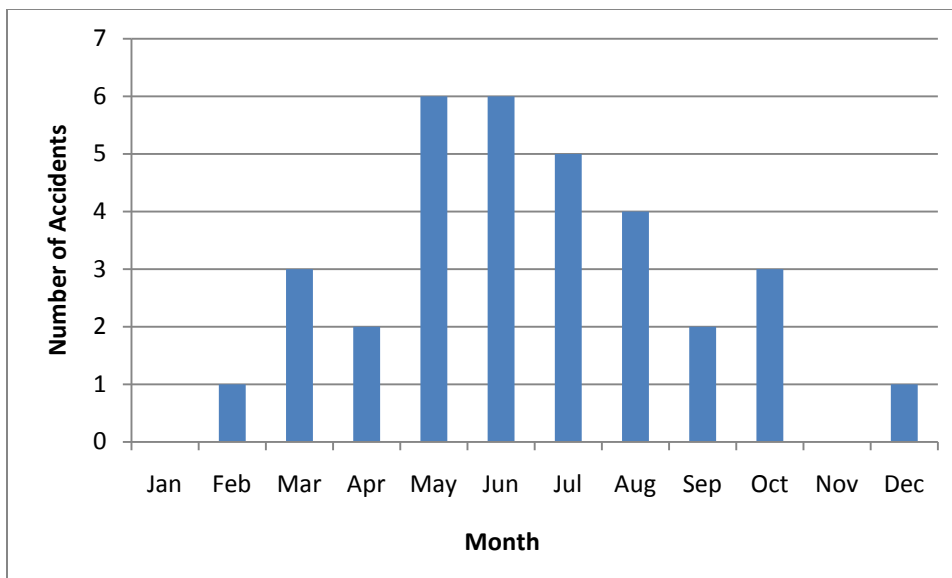
Source: NPS 2007a, 2007b, 2008a, 2008b, 2009a, 2009d, 2010a, 2010b.

### TRAFFIC

Traffic safety is particularly important because many visitors use the approximately 60 miles of South Beach as a roadway to travel along the Seashore. Once within the Seashore, visitors without 4WD vehicles are limited to surfaced roads, Bird Island Basin, Malaquite Beach, and the campground. They can also drive on North Beach and the northern five miles of South Beach when the sand is compacted enough and safe for two-wheel use. This prevents access to the down island portion of the Seashore for most visitors and contributes to overcrowding and pedestrian-vehicle conflicts.

Drivers are cautioned to drive with care and to strictly observe traffic laws and posted speed limits (NPS 2010d). Between January 2000 and the end of 2010, 34 vehicle accidents were recorded along South Beach. While accidents occurred year-round, the majority of accidents occurred during May, June, and July, when visitor use is at its peak (NPS 2009c) (figure 6). Vehicle accidents involved rollovers, striking animals, sideswiping other vehicles, running into campsites, hitting parked vehicles, rear-end and head-on collisions, striking pedestrians, and several non-injury accidents for which no description was recorded. (NPS 2009c). Figure 7 displays motor vehicle accidents by accident type along South Beach.

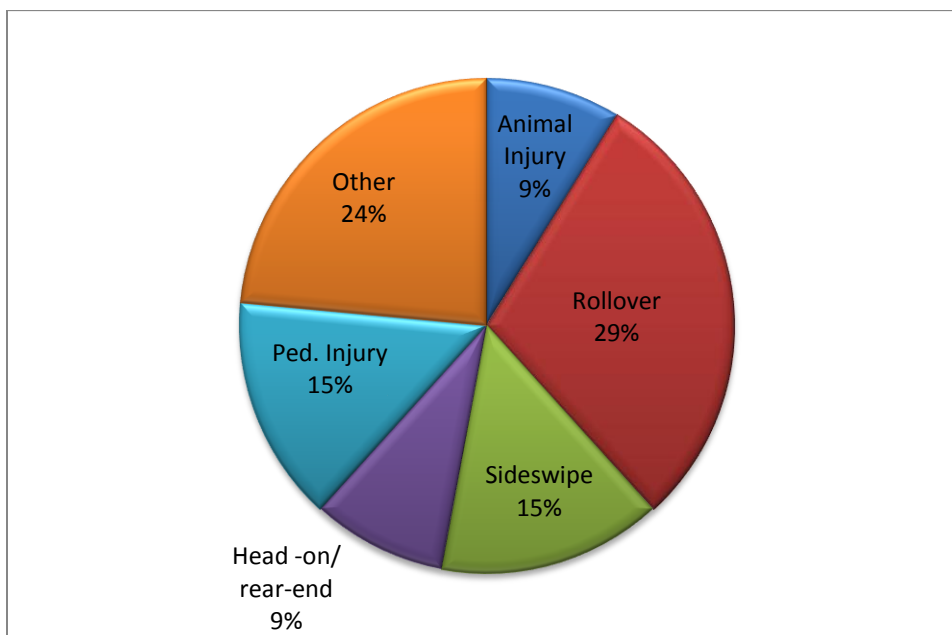




Note: for one accident occurring in 2008, no month was recorded; thus the graph totals 33 accidents instead of 34.

Source: NPS 2009c.

**FIGURE 6. MOTOR VEHICLE ACCIDENTS BY MONTH – SOUTH BEACH (2000-2010)  
(34 TOTAL ACCIDENTS)**



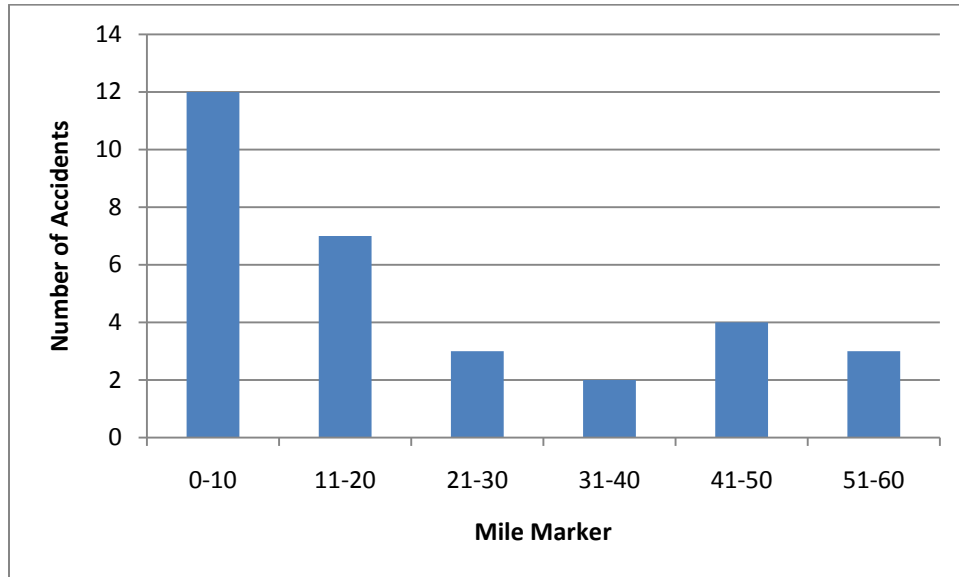
Note: due to rounding percentages total 101%.

Source: NPS 2009c, Martin 2011

**FIGURE 7. MOTOR VEHICLE ACCIDENT BY TYPE (34 TOTAL ACCIDENTS)**

Three of the 34 accidents involved hitting an animal; two were dogs and one was a deer. Of the 31 accidents that involved another vehicle, single vehicle accident, or a pedestrian, 19 accidents, or 56

percent, occurred within the first 20 miles of South Beach. Nine percent (three accidents) occurred within each ten mile marker increment from mile marker 21 to 30. Six percent (two accidents) occurred from mile marker 31 to 40. Thereafter, three accidents (nine percent) occurred from mile marker 41 to 50, as well as from mile marker 51 to Mansfield Channel (NPS 2009c). Figure 8 displays the 34 accidents by mile marker along South Beach.



Source: NPS 2009c, Martin 2011..

**FIGURE 8. ACCIDENTS BY MILE MARKER (2000-2010)**

Several incidents had contributing factors of excessive speed, particularly with rollover accidents (NPS 2009c). Two significant cases involved people falling asleep at the wheel and driving through campsites (NPS 2009c). In addition, while not recorded, Seashore law enforcement staff receive phone calls two to three times each weekend during high visitation periods from visitors complaining about vehicles speeding and accident near misses (Poulson 2011).

Due to the remoteness and backcountry nature of down island areas, drivers experience certain risks. Seashore staff assists visitors with contacting tow companies approximately 25 times per year. Beach and road closures occur when necessary, usually because of hurricanes, flooding, wildfires, debris or oil washing ashore, and an excessive amount of soft sand. Road conditions are monitored by the Seashore to ensure the safety of visitors and staff and to protect natural resources (NPS n.d.).

## **PARK PROTECTION**

The number one safety concern expressed by Seashore employees is the lack of significant ranger patrol presence down island (NPS 2002a). The Seashore is experiencing increased drug smuggling and illegal immigrant traffic. Coupled with poor radio and cellular telephone communications, this places visitors and Seashore staff at an increased risk. A recent visitor survey indicated that approximately one-third of the visitors feel that crime is a problem (Scott and Lai 2004). The Seashore has experienced car break-ins at Bird Island Basin and thefts down island. On occasion, illegal immigrants have approached and intimidated or robbed visiting campers of food and water (NPS 2002a). Undocumented aliens are also frequently found exhausted, dehydrated, injured, or suffering from a variety of medical problems. Poaching and driving under the influence of alcohol are major concerns as well (Mladucky 2010).

Natural resource protection includes prevention of poaching, illegal fishing, and natural resource damage. In 2007, there were 20 recorded natural resource violations. The Seashore has posted rules and regulations regarding protection of natural resources on its website, at information kiosks, at the visitor center, and at trailheads. Topics include wildlife protection (e.g., fishing and hunting); use of recreational equipment (e.g., off-road vehicle use and boating); use of fire, camping, sanitation and refuse control; and use of firearms and illegal drugs.

## WILDLIFE

With its diverse upland, wetland, and marine habitats, Padre Island National Seashore serves as important habitat for a variety of wildlife species and as wintering habitat for many migratory shorebirds. Although not all species necessarily inhabit or frequent the Gulf beach, the Seashore as a whole provides habitat for 47 species of terrestrial mammals, 380 species of migratory and residential birds, 56 species of reptiles and amphibians, and numerous invertebrates, including crabs and mollusks. Wildlife that is listed as federal and state threatened and endangered species are discussed in the section “Special-status Species.”

## MAMMALS

There are 47 species of terrestrial mammals that occur within the Seashore. Because of extreme temperatures, weather, and the lack of shade, most land mammals found in the Seashore are small, nocturnal or burrowing animals, though larger species such as coyote (*Canis latrans*), bobcat (*Felis rufus*) and white-tailed deer (*Odocoileus virginianus*) do occur. With the elimination of historic cattle grazing and subsequent recovery of vegetation within the Seashore, deer have become well established and now occur throughout the Seashore (NPS 2004b). Other common species in the Seashore include striped skunks (*Mephitis mephitis*), badgers (*Taxidea taxus berlandieri*), raccoons (*Procyon lotor*), jackrabbits (*Lepus californicus merriami*), spotted ground squirrel (*Spermophilus spilosoma*), opossum (*Didelphis virginiana*), mice, rats and bats. Populations of predator species such as coyotes and bobcats are cyclic and prey on species such as the jackrabbits, mice, rats and other small animals.

Mammals are not commonly found on the beach because suitable habitat and fresh water are scarce there. However, rodents and coyotes visit the beach while foraging, and deer have been documented on the beach side of the dune line. Thus, these mammals have the potential to be affected by beach driving.

## INVERTEBRATES

The Seashore’s beach ecosystem is home to a vast quantity of invertebrates, which form a valuable link in the coastal food chain. Many bird species found on the ocean beach, including the protected piping plover (*Charadrius melodus*) and other species such as the snowy plover (*Charadrius alexandrinus*), killdeer (*Charadrius vociferous*), willet (*Catoptrophorus semipalmatus*), and least sandpiper (*Calidris minutilla*) to name a few feed on invertebrates in areas open to beach driving, such as the intertidal zone and the wrack line (figure 9). Although no comprehensive studies of the invertebrate populations at the Seashore have been conducted (Cooper et al. 2005), some of the most identifiable invertebrates on the high-energy, intertidal beaches include the ghost crab (*Ocypode quadrata*, figure 10), mole crab (*Emerita talpoida*), and coquina clam (*Donax variabilis*). Both mole crabs and coquina clams are a primary prey base for surf-zone fish, crabs, and shorebirds, and the population density of some predators may actually be dependent on the availability of these invertebrate species (Greene 2002). Other invertebrates within the Seashore beach ecosystem include ghost shrimp (*Callichirus islagrande*), polychaete worms (*Scolecopsis* sp.), and limpets, which can be found in the intertidal zone.

Ghost crabs are sand-colored, terrestrial animals with square-shaped bodies, which are generally no more than 2 to 3 inches wide (Lippson and Lippson 1997). Ghost crabs are a top predator of the beach

ecosystem and can be used as an indicator species to analyze the health of the beach ecosystem due to their prominence and high susceptibility to anthropogenic disturbances (Hobbs et al. 2008). They are primarily nocturnal and create burrows for shelter from heat and desiccation (drying) stress during the warmer afternoon periods. Burrows are usually 0.6 to 1.2 meters (1.9 to 3.9 feet) in length and are generally located in an area from the high-tide line landward up to 400 meters (437 yards). Ghost crabs emerge from their burrows at night to feed in the intertidal zone, and travel at speeds up to 2 meters/second (6.6 feet/second) and can travel up to 300 meters (328 yards) while foraging (Hobbs et al. 2008). Ghost crabs retreat deep into their burrows during the winter months (Lippson and Lippson 1997).



**FIGURE 9. GULF COAST BEACH WITH SARGASSUM WRACK LINE**



**FIGURE 10. GHOST CRAB**

Like ghost crabs, mole crabs are a common inhabitant of the high-energy, exposed beach environment. In contrast to other species of crabs, they do not have claws or pincers. Mole crabs are generally less than 2 inches in length and have egg-shaped bodies that allow for rapid digging in wet sand (Ruppert and Fox 1988). Mole crabs are filter feeders that burrow and anchor themselves into the sands within the swash zone, collecting organic matter that they trap within their feeding antennae when water recedes over the buried crabs. Unlike ghost crabs, mole crabs move off the beach to deeper offshore waters during the winter (Lippson and Lippson 1997).

Marine bivalves such as coquina clams (*Donax variabilis*) and oysters (*Crassostrea virginica*) also inhabit the Seashore, forming the diet for many birds. Clams characteristically lie buried just beneath the surface of the sand, although they can burrow to greater depths as necessary. Much like the mole crab, coquina clams are filter feeders and migrate up and down the ocean beach in the intertidal area during the spring and summer (Ruppert and Fox 1988).

In addition to the intertidal zone, another important habitat for invertebrates is the wrack line. A wrack line is a line of stranded marine vegetation and debris along a beach face marking the point of maximum run-up during a previous high tide. The wrack line is often composed of drying seaweed, tidal marsh plant debris, decaying marine animals, shells, and miscellaneous debris washed up and deposited on the beach. The wrack line provides a habitat suitable for much invertebrate prey such as amphipods, annelids, beetles, mites, flies, and spiders. In addition, large amounts of marine algae (*Sargassum*) blow ashore within the Seashore, and like the wrack line, this provides suitable habitat for many invertebrates.

## BIRDS

Over 380 species of migratory and resident birds have been documented as occurring within Padre Island National Seashore including shorebirds, waterfowl, neo-tropical songbirds, and raptors (NPS 2011b). The Seashore lies along the Central Flyway, a migratory path for birds as they travel from North America to the Gulf Coast, Mexico, Caribbean and, for some species, as far south as Argentina and Chile. Its range of habitats makes Padre Island an essential stopover point for migrating and resident birds seeking areas for rest, food, nesting, and breeding. In addition to its importance as a stopover during migration, many birds winter on the island, while others are year-round residents (Chaney et al. 1993). As such, the island has been designated as a Globally Important Bird Area by the American Bird Conservancy and a Site of International Importance by the Western Hemisphere Shorebird Reserve Network (ABC 2011; WHSRN 2011).

The most comprehensive surveys of the general avian populations at Padre Island National Seashore were conducted in the early 1990s (Cooper et al. 2005). These studies found that the number of species detected on the west side of the island was nearly double that of the Gulf beach side, and that while some species prefer one side of the island or the other, some species switched between the two sides (Cooper et al. 2005). Birds on the Gulf beach are found either resting or foraging. Some of the more common birds include the laughing gull (*Larus atricilla*), great blue heron (*Ardea herodias*), black skimmer (*Rynchops niger*), royal tern (*Thalasseus maximus*), caspian tern (*Hydroprogne caspia*), least tern (*Sterna antillarum*), brown pelican (*Pelecanus occidentalis*), long-billed curlew (*Numenius americanus*), sanderling (*Calidris alba*), dunlin (*Calidris alpina*), and the willet (*Tringa semipalmata*). Several other species of birds migrate into the Seashore during the winter months, including black tern (*Chlidonias niger*), red knot (*Calidris canutus*), and American golden plover (*Pluvialis dominica*). The primary food source for many birds includes small fish and invertebrates. High-quality food sources for wintering and migrating shorebirds consist of invertebrates found either within the wrack line or intertidal zone.

## SPECIAL-STATUS SPECIES

The *Endangered Species Act* of 1973 (16 USC 1531, et seq.) requires an evaluation of the effects of proposed actions on all federally listed species, including threatened, endangered, and candidate species, and those proposed for listing. It also applies to designated and proposed critical habitat for those species. The USFWS determines if a species needs protection under the *Endangered Species Act* and how that species should be classified. Endangered species are considered to be in danger of extinction throughout all or a significant portion of their range. Threatened species are those likely to become endangered in the foreseeable future. Species proposed for listing are in the process of being listed. Candidate species are determined to warrant protection and are being considered for listing as endangered or threatened. Candidate species do not have legal protection.

In addition to federal species, NPS policy also requires examination of impacts on state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). The Texas Parks and Wildlife Department oversees listing of state species. Species listed as endangered or threatened by the state are defined in the same way as federally endangered and threatened species. The state also designates species of special concern, which have no legal protection. Table 5 presents federal and state threatened, endangered, and species of concern that are known to occur within the Seashore. Only those species that occur on the Gulf beach are discussed in detail.

**TABLE 5. SPECIAL-STATUS SPECIES KNOWN TO OCCUR IN PADRE ISLAND NATIONAL SEASHORE**

Species	Federal Status	State of Texas Status	Potential to Occur on Gulf Coast Beach (Yes/No)
<b>Reptiles and Amphibians</b>			
Kemp's Ridley Sea Turtle ( <i>Lepidochelys kempi</i> )	E	E	Yes
Green Sea Turtle ( <i>Chelonia mydas</i> )	T	T	Yes
Atlantic Hawksbill Sea Turtle ( <i>Eretmochelys imbricata</i> )	E	E	Yes
Loggerhead Sea Turtle ( <i>Caretta caretta</i> )	T	T	Yes
Leatherback Sea Turtle ( <i>Dermochelys coriacea</i> )	E	E	Yes
American Alligator ( <i>Alligator mississippiensis</i> )	T (S/A)		Yes (rare)
Spot-tailed Earless Lizard ( <i>Holbrookia lacerate</i> )		SOC	No
Texas Horned Lizard ( <i>Phrynosoma cornutum</i> )	SOC	T	No
Texas Indigo Snake ( <i>Drymarchon corais erebennus</i> )		T	No
Texas Scarlet Snake ( <i>Cemophora coccinea lineri</i> )		T	No
Texas Tortoise ( <i>Gopherus berlandieri</i> )		T	No
<b>Birds</b>			
Eastern Brown Pelican ( <i>Pelecanus occidentalis</i> )	Delisted	E	Yes
Reddish Egret ( <i>Egretta rufescens</i> )		T	Yes
White-faced Ibis ( <i>Plegadis chihi</i> )	C	T	Yes
Sooty Tern ( <i>Sterna fuscata</i> )		T	Yes
Piping Plover ( <i>Charadrius melodius</i> )	T	T	Yes
American Peregrine Falcon ( <i>Falco peregrines anatum</i> )	Delisted	T	Yes
Bald Eagle (lower 48 states) ( <i>Haliaeetus leucocephalus</i> )		T	No
Black-capped Vireo ( <i>Vireo atricapillus</i> )	E	E	No
Cerulean Warbler ( <i>Dendroica cerulea</i> )	T		No
Ferruginous Hawk ( <i>Buteo regalis</i> )	SOC		No
Northern Aplomado Falcon ( <i>Falco femoralis</i> )	E	E	Yes
Loggerhead Shrike ( <i>Lanius ludovicianus</i> )	SOC		No
Swallow-tailed Kite ( <i>Elanoides forficatus</i> )		T	No
Tropical Parula ( <i>Parula pitiayumi</i> )	C	T	No
White-tailed Hawk ( <i>Buteo albicaudatus</i> )		T	No
Wood Stork ( <i>Mycteria americana</i> )		T	No
<b>Plants</b>			
Roughseed Sea Purslane ( <i>Sesuvium trianthemoides</i> )	C	SOC	No
Slender Rushpea ( <i>Hoffmannseggia tenella</i> )	E		No

Acronyms: T – Threatened, E – Endangered, C – Candidate, SOC – Species of Concern, and S/A – Similar in Appearance

## SEA TURTLES

Sea turtles are large marine reptiles found in subtropical, tropical, and temperate oceans as well as subarctic areas. They spend the majority of the time in ocean waters, with females only coming ashore to nest on sandy beaches. Five of the seven sea turtle species existing in the world today have been documented nesting in the Seashore; they are the Kemp's ridley sea turtle, loggerhead sea turtle, green sea turtle, hawksbill sea turtle, and leatherback sea turtle, though the Kemp's ridley is by far the most frequent nester. The Kemp's ridley sea turtle was federally listed as endangered in 1970 (NMFS, USFWS, and SEMARNAT 2010) as was the leatherback sea turtle (NMFS and USFWS 1992) and the hawksbill sea turtle (NMFS and USFWS 1993). The loggerhead sea turtle was federally listed as threatened in 1978 (NMFS and USFWS 2008). Also in 1978, the green turtle was federally listed as threatened, except for the breeding populations in Florida and on the Pacific Coast of Mexico, which were listed as endangered (NMFS and USFWS 1991).

### Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

The Kemp's ridley sea turtle was originally listed as federally endangered because population numbers on nesting beaches dropped drastically. From an estimated number of nesting females in excess of 40,000 in 1947, the species declined to an estimated 320 nesting females by the mid-1980s. Causes of population decline are thought to be from the intensive annual harvest of eggs and mortality of juveniles and adults from trawling fisheries, including commercial shrimpers in the Gulf of Mexico.

Historic nesting records range from Mustang Island, Texas, in the north to Veracruz, Mexico, in the south, with the majority of nesting occurring in Mexico. The main nesting beach is a 16-mile stretch of beach near the village of Rancho Nuevo in Tamaulipas, Mexico. Lesser amounts of nesting also occur at adjacent beaches in Tamaulipas and in Veracruz, Mexico. With protection and conservation efforts, the number of Kemp's ridley nests on these beaches has increased since the mid-1980s by approximately 14 to 16 percent annually, with over 20,000 nests, representing approximately 8,000 nesting females (based on an estimated 2.5 nests per female each season), observed during the 2009 nesting season (NMFS, USFWS, and SEMARNAT 2010). The 2010 Draft Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (NMFS, USFWS, and SEMARNAT 2010) sets recovery criteria for downlisting the species in part to:

1. A population of at least 10,000 nesting females in a season (as measured by clutch frequency per female per season) distributed at the primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) in Mexico is attained. Methodology and capacity to implement and ensure accurate nesting female counts have been developed.
2. Recruitment of at least 286,000 hatchlings to the marine environment per season at the three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) in Mexico is attained to ensure a minimum level of known production through *in situ* incubation, incubation in corrals, or a combination of both.

It also sets recovery criteria for delisting the species in part to:

1. An average population of at least 40,000 nesting females per season (as measured by clutch frequency per female per season) over a 6-year period distributed among nesting beaches in Mexico and the U.S. is attained. Methodology and capacity to implement and ensure accurate nesting female counts have been developed.



2. Ensure average annual recruitment of hatchlings over a 6-year period from *in situ* nests and beach corrals is sufficient to maintain a population of at least 40,000 nesting females per nesting season distributed among nesting beaches in Mexico and the U.S. into the future. This criterion may rely on massive synchronous nesting events (i.e. arribadas) that will swamp predators as well as rely on supplemental protection in corrals and facilities.

In the United States, the majority of nesting occurs in south Texas. The first documented record of Kemp's ridley nesting on the Texas coast was made in 1948 at what was later designated as Padre Island National Seashore (NMFS, USFWS, and SEMARNAT 2010). A few nests were recorded from 1948-1978 (Shaver and Caillouet 1998). However, there were no systematic detection efforts and no established means for the public to report sightings during those years, so additional nests likely went unrecorded. Currently, approximately 55 percent of Kemp's ridley nests found in the United States occur at Padre Island National Seashore (Shaver 2010a). Elsewhere in the United States, nests have been documented in North Carolina, South Carolina, Georgia, Florida, and Alabama.

The Kemp's ridley sea turtle is the smallest of all extant sea turtles, with adults generally weighing between 70 and 108 pounds and having a carapace length between 23 to 25 inches (NMFS, USFWS, and SEMARNAT 2010; figure 11). The Kemp's ridley is the only sea turtle with an almost circular upper shell. The young are dark gray in color but change as they mature. Adults are olive green above and yellow below.



**FIGURE 11. NESTING KEMP'S RIDLEY SEA TURTLE**

Adults reach maturity at about 12 years of age and lay approximately 2.5 nests each season they nest. The nesting season date varies slightly each year. In Mexico, Kemp's ridley nests have been recorded as early as March and as late as August. The nests documented at Padre Island National Seashore from 1979 to 2010 were found during the months of April, May, June, and July; the months that beach surveys were conducted most intensively. Nesting is primarily during daylight hours and often occurs in synchronized emergences termed *arribadas*, though some night nesting has been recorded and individual or solitary nesting is common. Females emerge from the ocean and crawl toward the dune line until they encounter a suitable nest site, which may occur anywhere from the high-tide line into the dunes. The female clears



away surface debris with her front flippers, and then excavates a nest cavity with her hind flippers. After laying her eggs, the female covers the nest with sand and then crawls back to sea. The female turtles are on the beach for approximately 30 to 45 minutes while nesting. Clutch sizes average around 100 eggs and hatchlings emerge after about 50 days of incubation. Hatchlings usually emerge at night or early morning and crawl to the ocean where they swim offshore for approximately 20 to 30 hours (NMFS, USFWS, and SEMARNAT 2010).

In 1978, the United States joined Mexico in efforts to try to save the species from extinction and recover the population. Multi-agency, international programs were developed, including an attempt to increase nesting by this indigenous species at Padre Island National Seashore to form a secondary nesting colony at a protected beach in the United States, as a safeguard against extinction. From 1978 to 1988, 22,507 Kemp's ridley eggs were shipped from Rancho Nuevo to Padre Island National Seashore to re-establish a nesting colony there. Overall, 77.1 percent of the eggs hatched and the resulting hatchlings were transferred to the National Marine Fisheries Service (NMFS) Laboratory in Galveston, Texas, for head-starting (rearing in captivity). A total of 13,513 turtles imprinted to the Padre Island National Seashore were released into U.S. waters most after 9 to 11 months in captivity, and most into the Gulf of Mexico approximately 18.6 miles offshore from Mustang or North Padre Island. From 1989 to 2000, NMFS continued to head-start between 178 and 2,000 hatchlings per year, but these were obtained directly from Mexico and it was thought they would return to Mexico to nest. Overall, nearly 10,500 of these Mexico imprinted head-starts were released, most in Gulf of Mexico waters off Galveston or Mustang Island (Shaver 2010a; figure 12).

Efforts to locate, document, study and protect nesting Kemp's ridley turtles and nests began at Padre Island National Seashore in 1986 and have continued since that time, but nesting patrols were intermittent and not comprehensive until 1998 (Shaver 2010a).

Finding and protecting nesting Kemp's ridley turtles at Padre Island National Seashore is complicated by the configuration of the Seashore and nesting habits of the species. There are many miles of beachfront and there is no road behind the dunes to access the 60 southernmost miles. Nests are located by seeing the nesting females and/or following the tracks that they leave in the sand. Nesting Kemp's ridley turtles are on the beach for less than an hour, are nearly motionless during about 15 minutes of that time (when laying eggs), and often become partially covered with sand and blend in with the sand and vegetation due to their coloration. Kemp's ridley turtles are also only about 9 inches tall. This is often shorter than the mounds of seaweed, other debris, vehicle tire ruts, accumulations of sand (i.e. hummocks, embryonic dunes, foredunes), and vegetation on the beach. Their short stature, combined with their color blending with the sand and vegetation, and their lack of motion when laying eggs make them difficult to see on the beach. Because the Kemp's ridley is the smallest and lightest sea turtle species the nesting females leave only a faint track which disappears quickly. They often nest on windy days and winds contribute to rapid track obliteration. Additionally, their habit of *arribada* nesting necessitates multiple patrollers being distributed along the beach to intercept simultaneous nesting.

Today, detection involves repeated daily patrols to look for nesting activity, public education, and investigation of reports from patrollers, beach workers, and the public. Patrollers (NPS staff members and volunteers) use utility transport vehicles to search the Seashore and adjacent state beaches to the north of the Seashore (approximately 80 miles total) for sea turtle tracks and nesting sea turtles (all species). From April through mid-July each year, NPS personnel also use a 4WD truck every other day to deliver supplies to the cabin where patrollers stay overnight, nearly 40 miles down the beach. During this time, from zero to five 4WD vehicles are used daily by project supervisors to respond to nesting reports and by personnel to retrieve sea turtle eggs for protected incubation and stranded sea turtles for rescue or necropsy. From mid-July through September, from zero to two utility transport vehicles and/or 4WD vehicles are used daily to patrol to find nests from late nesting Kemp's ridley sea turtles, nests from other

sea turtle species, and stranded sea turtles. From late-May through October, from zero to three 4WD vehicles are also used daily to transport hatchlings on the beach for release. From October through March, up to one 4WD vehicle is used to patrol one day per week to locate stranded sea turtles. Year-round, a 4WD vehicle is used on the beach to retrieve stranded sea turtles that are reported by the public (Shaver 2010e).

Hatchlings are released from nests protected at the Seashore, and are guarded during release. The public is invited to attend 20 or more hatchling releases that are announced and held at the Seashore each year. These releases receive local, state, national and international media coverage and draw thousands of visitors annually.



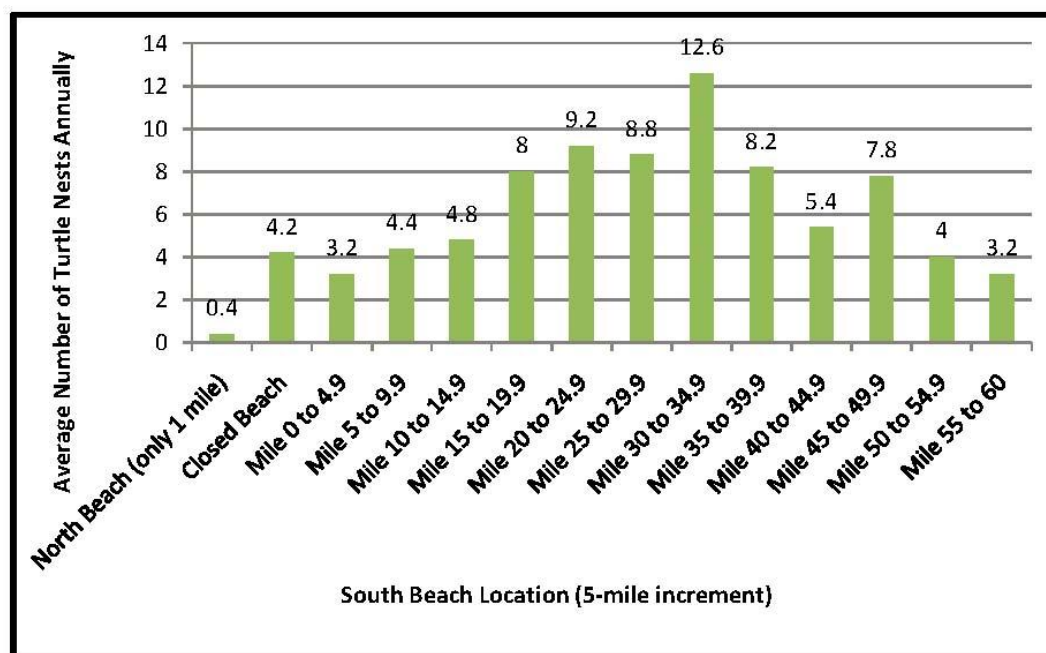
**FIGURE 12. KEMP'S RIDLEY HATCHLING RELEASE AT PADRE ISLAND NATIONAL SEASHORE**

Table 6 shows the number of Kemp's ridley turtle nests documented within the Seashore since 1986 when turtle patrols began. From 1986 to 1994, only one Kemp's ridley nest was documented in the Seashore, but patrols were limited during that time. Since 1994 the number of Kemp's ridley nests found at the Seashore has increased, and beginning in 2006 the numbers have increased dramatically, with a peak of 117 nests documented in 2009. The 117 nests documented in 2009 are 16.7% of 702 nests recorded worldwide at the low point of Kemp's ridley nesting in 1985. As seen in figure 13, Kemp's ridley sea turtles nest throughout the entire Seashore.

**TABLE 6. NUMBER OF KEMP'S RIDLEY SEA TURTLE NESTS DOCUMENTED AT PADRE ISLAND NATIONAL SEASHORE SINCE 1986**

Year	Number of Nests	Year	Number of Nests
1986	0	1999	11
1987	0	2000	5
1988	0	2001	3
1989	0	2002	23
1990	0	2003	14
1991	1	2004	22
1992	0	2005	27
1993	0	2006	64
1994	1	2007	73
1995	2	2008	93
1996	5	2009	117
1997	5	2010	74
1998	9		

Sources: Shaver 1996, 1997, 1998a, 1999, 2000b, 2001, 2002, 2004, 2005, 2006a, 2006b, 2007, 2008, 2009, 2010a, 2010f.



Source: Shaver 2010f.

**FIGURE 13. LOCATION OF KEMP'S RIDLEY SEA TURTLE NESTS DOCUMENTED AT PADRE ISLAND NATIONAL SEASHORE (2006-2010)**

**Green Sea Turtle (*Chelonia mydas*)**

Adult green sea turtles may reach sizes up to 48 inches in carapace length and weigh over 440 pounds. Green sea turtles range throughout the tropics worldwide. It is the only herbivorous sea turtle (USFWS 2009a).

Green sea turtles feed on the seagrass beds and algae that grow in shallow waters. Open beaches with a sloping platform and minimal disturbance are required for nesting. Green sea turtles have a strong nesting fidelity and often make long-distance migrations between feeding grounds and nesting beaches. The greatest causes of decline in green turtle populations are commercial harvest for eggs and meat, disease, habitat loss, pollution, and excessive nest predation. Incidental catch during commercial fishing operations and channel dredging are continuing sources of mortality that adversely affect populations (USFWS 2009a).

Texas waters provide important developmental and migratory habitat for juvenile green sea turtles and the juvenile green turtle population is growing rapidly in Texas (Shaver et al. in press). At Padre Island National Seashore, juvenile green sea turtles inhabit waters of the nearshore Gulf of Mexico, the Laguna Madre, and the Mansfield Channel. Many are found stranded at the Seashore each year. Hypothermic stunning is a significant source of mortality of juvenile green sea turtles in Texas (Shaver 2000a). Additionally, many juveniles are found washed ashore in association with *Sargassum* seaweed.

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 with a breeding season (the average number is usually two to three clutches) (NMFS and USFWS 1991). Average clutch size is usually 110 to 115 eggs. Hatchling emergence occurs at night.

The green sea turtle has a worldwide nesting distribution. Major nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam (USFWS 2009a). In the United States, green sea turtles nest in smaller numbers in the U.S. Virgin Islands, Puerto Rico, Georgia, South Carolina, North Carolina and Texas. A larger number occur in Florida and are recognized as a regionally significant colony. About 200 to 1,100 females are estimated to nest on beaches in the continental United States. Although historic nesting by green turtles on the Texas coast is suspected, the first confirmed nest was not documented there until 1987 (Shaver 2000a). A few green turtles occasionally nest within the Seashore. Since 1986, 29 green turtle nests have been documented in the Seashore ranging from 0 to 5 nests annually. In Texas, nesting occurs from May through September (Shaver 1996, 1997, 1998a, 1999, 2000b, 2001, 2002, 2004, 2005, 2006a, 2006b, 2007, 2008, 2009, 2010a, 2010f).

**Hawksbill Sea Turtle (*Eretmochelys imbricata*)**

The hawksbill sea turtle is a small- to medium-sized sea turtle ranging worldwide throughout the tropics. Adult hawksbill turtles may reach up to 3 feet in length and weigh up to 300 pounds, but commonly average about 2.5 feet in length and weigh between 95 and 165 pounds (USFWS 2009b).

Hawksbills nest primarily at night, throughout the Gulf of Mexico and Caribbean. Their primary nesting areas in the United States are in Puerto Rico, the Virgin Islands, the southeast coast of Florida, and the Florida Keys. Unlike Kemp's ridley sea turtles, which tend to nest in large groups, hawksbills prefer to nest alone or in small groups on isolated beaches. Hawksbills normally nest every second or third year producing 140 to 160 eggs per clutch with an average of approximately five nests per season and intervals of approximately 14 days between nesting activities. Incubation takes about 60 days for eggs to hatch (NMFS and USFWS 1993).

Historic nesting by this species on the Texas coast is unknown, with only one nest recorded in 1998. This nest was located at the southern end of Padre Island National Seashore (Shaver 1999). The nesting season for hawksbills varies geographically and may extend from April through October in the Caribbean and Gulf Coast of Mexico (NMFS and USFWS 1993).

### **Leatherback Sea Turtle (*Dermochelys coriacea*)**

The leatherback sea turtle 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. Found worldwide, their primary nesting beaches in the Atlantic are on the northern coast of South America and at various locations around the Caribbean. A few nest in Florida and on the Gulf of Mexico coastline in Mexico. 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 to 116 eggs (NMFS and USFWS 1992). Hatchling emergence typically occurs at night. One leatherback nest was located at Padre Island National Seashore in 2008 (Shaver 2009). Prior to this, the most recent nesting records in Texas were from the 1920s and 1930s at what later became Padre Island National Seashore. The National Seashore is the only location in Texas where leatherback nests have been recorded (NPS 2009b). Leatherbacks infrequently strand at Padre Island National Seashore (Shaver 1998b).

### **Loggerhead Sea Turtle (*Caretta caretta*)**

The loggerhead sea turtle 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.

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 to 125 eggs along the southeastern U.S. coast (NMFS and USFWS 2008). Hatchling emergence typically occurs at night. Loggerheads nest in the United States from Texas to as far north as Virginia and (rarely) to Maryland and New Jersey. 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 United States / Mexico border in the south.

At Padre Island National Seashore, loggerhead turtles sometimes inhabit nearshore Gulf of Mexico waters for foraging or migration. Additionally, a few occasionally nest at the Seashore and many more are found stranded (Shaver 1998b, 1999). From 1986 to 2010, 41 loggerhead nests have been documented at the Seashore (at various locations scattered along the coast of the Seashore), with anywhere from 0 to 9 nests occurring annually. At the Seashore, loggerhead nests have been found from May through early August, although nesting has been documented in the southeastern United States from April through September.

## **BIRDS**

### **Eastern Brown Pelican (*Pelecanus occidentalis*)**

The eastern brown pelican was federally listed as endangered in 1970 under a law that preceded the *Endangered Species Act* of 1973. As a result of the ban on the use of the pesticide DDT in the United States as well as other conservation efforts, the species has made a strong comeback, and was

subsequently removed from the list of threatened and endangered species throughout its range by the USFWS in November 2009. It is now estimated that there are 650,000 individuals globally. The brown pelican is still listed by the state of Texas as endangered.

The eastern brown pelican is a large, dark gray-brown waterbird with white about the head and neck (figure 14). This species is found along salt bays, beaches, and oceans and is generally found near shallow waters adjacent to the coast, especially on sheltered bays. Brown pelicans feed almost entirely on menhaden, smelt, and anchovies, but can occasionally feed on crustaceans.



**FIGURE 14. EASTERN BROWN PELICAN**

Brown pelicans occur in the Seashore year-round along the Gulf and Laguna Madre sides of Padre Island. Individuals use the Seashore for resting and foraging and are typically found in the nearshore and washover habitat. 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.

### **Reddish Egret (*Egretta rufescens*)**

The reddish egret is a candidate species at the federal level and listed as threatened by the state of Texas. The reddish egret is an uncommon bird that breeds in scattered areas along the Gulf of Mexico, the Caribbean, and west Mexico. They 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 Seashore's northern boundary southward to the Port Mansfield Channel. During a 1992 – 1993 survey, 43 reddish egrets were documented either feeding in the shallow water of the nearshore area or standing on the foreshore area ready to enter the water on the Gulf beach shoreline between the Yarbrough Pass and Mansfield Channel. This is compared to 1,760 reddish egrets found along the Laguna Madre shoreline for the same area, indicating that this species prefers the Laguna Madre habitat to the Gulf beach (Chaney et al. 1993; NPS 2007c).

### **White-faced Ibis (*Plegadis chihi*)**

The white-faced ibis is a federal species of concern and is listed as threatened in Texas because of habitat loss from the draining of wetlands and effects of pesticides. This species is a common migrant 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 and can be found resting or foraging along the Gulf beach. It is an uncommon or rare species in Texas during the winter.

### **Sooty Tern (*Sterna fuscata*)**

The sooty tern is state listed as threatened. It is a mostly pelagic bird with a length of 16 inches and wingspan of 34 inches (figure 15). Sooty terns are fairly large with a dark, slender, pointed bill and long, dark deeply forked tail. They have a smoothly rounded head with a broad white forehead and a body with black upperparts and legs and white underparts. They forage principally on small fish and squid, but may also occasionally take crustaceans, insects, and offal from the surface of the water. Within the Seashore, the sooty tern can be found resting or foraging on the Gulf beach.



**FIGURE 15. SOOTY TERN**

### **Piping Plover (*Charadrius melodious*)**

The piping plover is a small, stocky, sand-colored shorebird with orange-yellow legs, a black band across the forehead between the eyes, and a black ring around its neck. There are three distinct breeding populations: Atlantic Coastal, Great Lakes region, and the Northern Great Plains, with wintering ranges along the southern Atlantic Coast for the Atlantic Coastal population and the Gulf Coast for the remaining populations. The current Atlantic coast population is estimated to be about 1,400 pairs, while the Great Lakes and Northern Great Plains populations reported 32 breeding pairs and 5,938 individuals, respectively, in 2001 (USFWS 2004). The species was federally listed as threatened on January 10, 1986. It is also listed as threatened by the state of Texas. Current threats to their existence include development, human disturbance (including pets), increased numbers of scavenging predators near concessions, and storm tides (USFWS 2004).

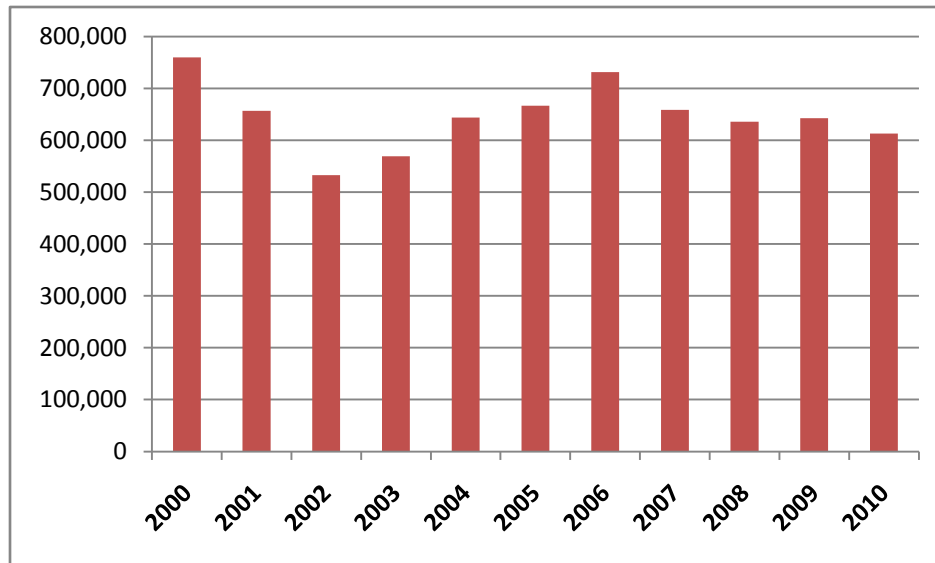
Piping plovers are present in the Seashore during all seasons of the year (Chaney et al. 1995) and use the wind-tidal flats, the washover channels, and the Gulf Coast beaches for resting, feeding, and foraging on benthic invertebrates and insects. In 1992 to 1993, a study documented 602 plovers over the entire 60 miles of South Beach, with 400 of these being found along the Gulf beach foreshore (Chaney et al. 1993). It is estimated that between 60 to 65 percent of all piping plovers winter in south Texas (Chaney et al. 1995).

No nesting has been recorded in Padre Island National Seashore to date and there is no critical habitat designated for this species in the Seashore.



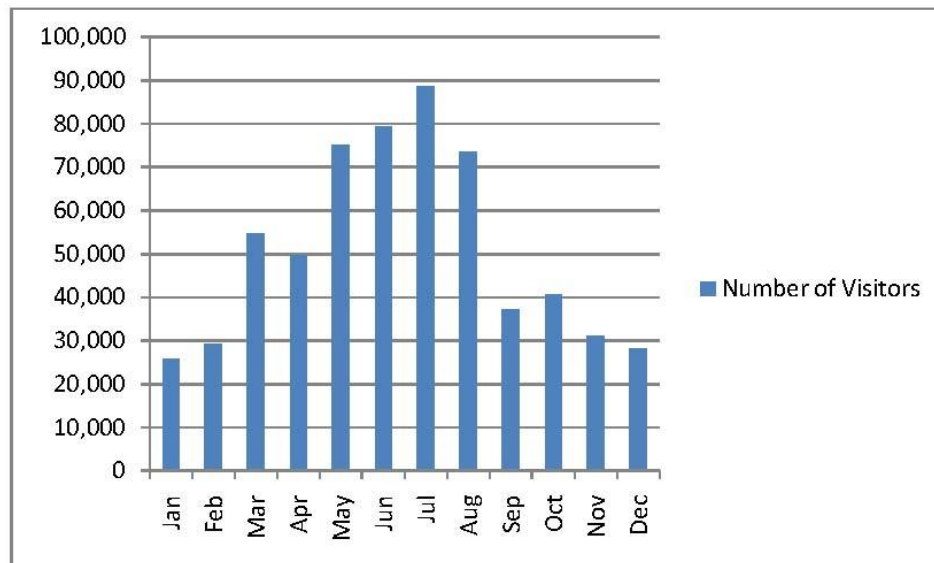
## VISITOR USE AND EXPERIENCE

Padre Island National Seashore receives approximately 600,000-700,000 visitors annually. During the ten years from 2000 through 2010, the average visitation was 634,894, with the highest number of visitors (759,596) in 2000 and the lowest number (532,843) in 2002 (NPS 2010a). The peak visitor months are May, June, July, and August (NPS 2010b). Figures 16 and 17 display visitor use numbers for the Seashore.



Source: NPS 2010a.

**FIGURE 16. ANNUAL SEASHORE VISITATION (1998-2010)**



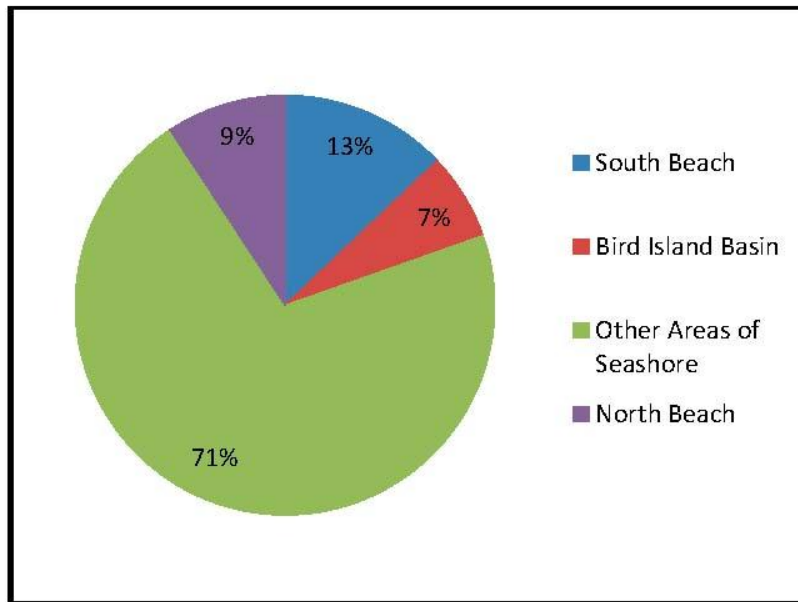
Source: NPS 2010b.

**FIGURE 17. MONTHLY PARK VISITATION (2010)**

Like most national parks, visitation at Padre Island National Seashore peaks during the summer when children are out of school and when people generally take vacations. Use is highest on long weekends



when local residents take advantage of Seashore beaches; however, even during the four lowest visitor months, an average of 32,000 people per month use the Seashore (NPS 2010b). As demonstrated in figure 18, an average of 13 percent of all annual visitors drive on South Beach. This number ranges from 10 to 15 percent monthly (NPS 2010b, 2010c). In figure 18, the category entitled “Other Areas of Seashore” includes visitors to the Laguna Madre, Malaquite Beach, and campground portions of the Seashore, which total 71 percent of annual visitors to the Seashore.



Source: NPS 2010b, 2010c.

**FIGURE 18. VISITOR USE STATISTICS (MAY 2009 – APRIL 2010)**

People visit Padre Island National Seashore for many different reasons. Surveys have been completed of down island visitors (Ditton and Gramann 1987) and general visitors to Padre Island National Seashore (Scott and Lai 2004). These surveys examined the reasons people visit Padre Island National Seashore, and the top motives for visitors in the 1987 survey were “to be outdoors” and “for relaxation and rest.” The 2004 survey found “almost all respondents (80 percent) reported walking on the beach, and many people also enjoyed sight-seeing, driving on the beach, collecting shells and things on the beach, birdwatching, and fishing from shore” (Scott and Lai 2004).

The Seashore’s Gulf beach is broken into three sections: North Beach, Closed Beach, and South Beach. North Beach is approximately 1 mile in length and extends from the Seashore’s northern boundary to a set of bollards marking the northern extent of Closed Beach. Driving and camping are permitted on North Beach. Closed Beach is a pedestrian-only beach and no visitor vehicles are allowed there (figure 19). Closed Beach extends south of North Beach for 4.5 miles to a set of bollards marking the beginning of South Beach. The Malaquite campground and Malaquite Visitor Center are included in the Closed Beach section.



**FIGURE 19. VISITOR USE ON CLOSED BEACH**

The third section, South Beach, is the longest of the beach sections. It extends for 60 miles south and can typically be accessed by two-wheel-drive vehicles for the first 5 miles. For the remaining 55 miles, soft sand requires that vehicles be 4WD to drive down island. However, sand conditions vary and sometimes a 4WD vehicle is needed to access the first 5 miles, while at other times, two-wheel drive vehicles are able to navigate below 5 miles, although advised not to by signage (NPS 2001b; figure 20). South Beach contains two areas referred to as Little Shell and Big Shell, which are formed by currents converging off the coast of Padre Island. As the currents converge, shells are broken into smaller fragments that become deposited on the beach. Little Shell is characterized by shell fragments about 1/2 inch wide from the four-wheel-drive sign to mile marker 15 on South Beach (NPS 2001b).

In contrast, Big Shell is composed of shell fragments between 1/2 and 2 inches wide and is located between the mile markers 18 and 30. The beach profile of Big Shell changes between the summer and winter months. During the winter, the beach extends westward from the Gulf of Mexico to a berm approximately 3 to 5 feet in height. The summer months, with weaker wave intensity, create a berm that is 1.5 to 6 feet high. From the berm, the beach extends relatively flat until it reaches the foot of the primary dunes. Driving on Big Shell is typically slow (NPS 2001b).



**FIGURE 20. VISITOR USE ON SOUTH BEACH**

South Beach ends at Mansfield Channel. This visitor destination is at the far south end of the island and is accessed by private boat or 4WD vehicle. Visitor opportunities include camping, beachcombing, bird and other wildlife watching, and fishing. The experience at Mansfield is remote and there are no visitor services or facilities.

All beach sections contain various types of manmade garbage ranging in size from smaller than a soda bottle to steel buoys fifteen or more feet in diameter. Garbage originates primarily from offshore sources. Natural debris such as the marine algae *Sargassum* and driftwood also wash ashore. This debris is often buried and can make driving hazardous (NPS 2001b). Hazardous material consisting of caustic fluids, acids, or fuming liquids may wash up in containers ranging in size from a few gallons to over 500 gallons which Seashore staff regularly removes (NPS 2011a).

The project area for the proposed action includes the South Beach portion of Gulf beach. Visitor use on the Gulf beach includes the popular activities of beachcombing, swimming, picnicking, camping, sunbathing, fishing, and bird and other wildlife watching. These activities are typically highest near the Seashore's visitor center and campground at Malaquite Beach; however, visitors can also seek a more solitary experience by using less populated areas of the Seashore. In general, use is concentrated in the northern third of the Seashore, where driving is easiest and support facilities are available (NPS 2001b). The remoteness found along South Beach, such as the Mansfield Channel, is a quality valued by users.

Throughout 2003, when the 2004 visitor survey was conducted at the Seashore by Texas A&M University, approximately 40 percent of the visitors surveyed were visiting Padre Island National Seashore for the first time. One-fourth of the winter visitors had visited the Seashore at least seven or more times during the previous 12 months, compared to only 10 percent of the spring visitors. These numbers may reflect the popularity of the Seashore among retirees (winter Texans) who spend an average of 4.1 months in south Texas during the fall, winter, and early spring months (Scott and Lai 2004). Almost three-fourths of the winter visitors were retired or semi-retired and were at least 55 or older, compared to 40 percent of those individuals surveyed in the spring, half of whom were still employed (Scott and Lai 2004).

The survey found that approximately 76 percent of visitors stayed within the Seashore for less than 24 hours (Scott and Lai 2004). Overnight visitors generally stayed four or fewer days (Scott and Lai 2004). Beach camping is popular, and campsites may become concentrated immediately south of the

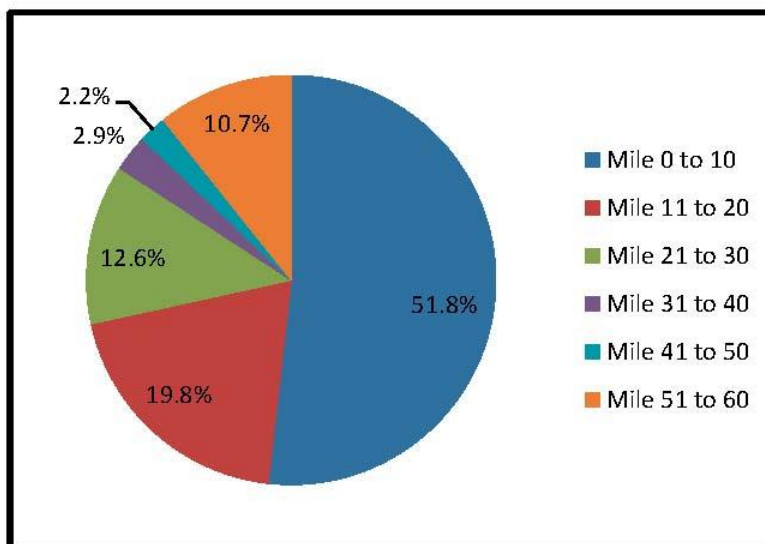
visitor center, where they may fill the beaches from the high-tide zone to the dune line (NPS 2001b). Some people camp at Little Shell and Big Shell beaches and near Mansfield Channel. Both the 1987 and 2004 visitor surveys explored how far down island visitors went while driving along the Gulf beach. A comparison of those visitor numbers is provided in table 7 and figure 21.

**TABLE 7. DOWN ISLAND VISITOR COMPARISON (1987 AND 2004)**

Mile Range	2004 (%)	Cumulative 2004 (%)	1987 (%)	Cumulative 1987 (%)
Mile 0 to 10	51.8%	51.8%	81.0%	81.0%
Mile 11 to 20	19.8%	71.6%	11.8%	92.8%
Mile 21 to 30	12.6%	84.2%	4.3%	97.1%
Mile 31 to 40	2.9%	87.1%	1.5%	98.5%
Mile 41 to 50	2.2%	89.3%	0.6%	99.1%
Mile 51 to 60	10.7%	100.0%	0.9%	100.0%

Percent: Percent is determined by the total number of beach visitors surveyed during the respective survey years.

Source: Scott and Lai 2004; Ditton and Gramann 1987.



**FIGURE 21. VISITOR DESTINATION ALONG SOUTH BEACH (2004)**

The increase in the number of visitors traveling down island over time is possibly correlated to the increased popularity and availability of 4WD vehicles during that period (see chapter 1), therefore making driving down island easier for visitors. The beach provides the only means of getting down island and is defined as a road in the state of Texas with all applicable road laws applying.

## SEASHORE OPERATIONS AND MANAGEMENT

The superintendent of Padre Island National Seashore is responsible for managing the Seashore, its staff and residents, all of its programs, and interactions with visitors, agencies, and organizations interested in the Seashore. Seashore staff provides the full scope of functions and activities to accomplish management objectives and meet the requirements of Seashore protection, emergency services, Seashore health and

safety, science, resource protection and management, emergency services, interpretation and education, facility management, and management support. Currently, there are 39.6 full-time employees supplemented by 17.4 temporary and seasonal full time equivalent positions, in six operational divisions. The proposed changes in speed limit would potentially impact all six divisions. The staffing and responsibilities of those divisions are described below.

### **SEA TURTLE SCIENCE AND RECOVERY DIVISION**

The Sea Turtle Science and Recovery Division has 5 full-time and 28 seasonal employees and is responsible for all activities related to the management, protection, and preservation of sea turtles inhabiting park waters or nesting at the Seashore and elsewhere (Shaver 2010e). Activities include research, restoration activities, species management, public outreach, and technical assistance.

### **VISITOR AND RESOURCE PROTECTION DIVISION**

The Ranger Division has 18 employees and is in the process of filling two additional full-time positions. Currently there are seven full time field law enforcement personnel, with two additional field law enforcement personnel in training whose positions will be converted to full-time positions upon graduation (Mladucky 2010). Additionally there are three law enforcement supervisors, one full-time ranger activities assistant, one visitor use assistant supervisor, and one full-time and three seasonal visitor use assistants.

This division is responsible for law enforcement and fee collections, with 94 percent of the workload dedicated to law enforcement. In addition to responding to reported violations and ensuring Seashore regulations are being adhered to, division personnel perform compliance checks on commercial use authorizations and special use permits within the Seashore and is the front line for all emergency management system calls within the Seashore.

### **SCIENCE AND RESOURCE MANAGEMENT**

The Science and Resource Management Division has 4 full-time employees and is in the process of filling 5 seasonal biotech positions. The division is responsible for permitting and monitoring of scientific research, oil and gas operations, as well as monitoring and maintaining natural and cultural resources within the Seashore. Resource staff are also responsible for insuring that all operations and projects within the Seashore comply with NEPA and other environmental orders.

### **FACILITY MANAGEMENT**

As of early 2011, the Facility Management Division has 24 full-time employees and may hire additional term, seasonal, or emergency hire employees as the need arises. These employee numbers include Student Career Experience Program and Student Temporary Employment Program hires, which are not permanent positions. The official mission of the Facility Management Division is to provide leadership and policy direction to ensure the stewardship of the Seashore's constructed assets and the development of its maintenance workforce. The Division is therefore responsible for:

- Facility Management policy and program development
- Liaison with the Intermountain Regional Office and other entities as authorized by the Seashore Superintendent
- Budget formulation advocacy and prioritization

- Standards and procedures for the operation and maintenance of facilities
- Promoting life-cycle asset management across program areas
- Adopting new technologies to support program objectives
- Advising the Superintendent on matters relating to Facility Management
- Protecting and preserving Seashore assets
- Providing visitor satisfaction and understanding
- Protecting resources.

In fulfilling these duties, the Facility Management Division regularly spends many hours on Seashore beaches removing trash and containers of hazardous materials. Following Hurricane Ike, from the end of October to November 2008, the Facility Management Division expended 3,350 man-hours to remove the following hazardous material containers: 55 totes (350-550 gallon containers), 352 55-gallon drums, 53 35-gallon containers, and 671 5-gallon buckets. In addition, in the following months they also removed 580 tons of trash, lumber, buoys, boats, rescue pods, compressed-gas cylinders, and other non-chemical flotsam that washed up as a result of Hurricane Ike (Slattery 2011).

Based on figures from the Facility Management Software System, from August 2007 to August 2010, Facility Management staff spent at least 11,787.68 man-hours working on Seashore beaches. During this time, approximately 85 percent of Facility Management staff time (10,029.93 hours) was spent on South Beach or other areas down island, such as Yarborough Pass. These are only the hours for removing trash or hazardous materials and include travel time.

Additional Facility Management staff hours are spent traveling down island to retrieve Seashore vehicles that have broken down, which are recorded as utility-terrain vehicle maintenance. During the 2010 sea turtle season, maintenance personnel had to make at least 26 trips down island to retrieve utility-terrain vehicles that had broken belts alone (Slattery 2011).

## **INTERPRETATION**

The Division of Interpretation and Education consist of 4 full-time employees, and 4 full time equivalent positions. The Division of Interpretation is responsible for staffing the Seashore visitor center, providing interpretive programs for Seashore visitors, providing curriculum based environmental education programs to educational groups, and public outreach programs to civic organizations and educational groups.

The Division of Interpretation also plans and develops educational materials in the form of site bulletins, Seashore newspaper, and other periodicals and also manages the Seashore website.

## **ADMINISTRATION**

The Administration Division has 5 full-time employees and is responsible for the management and execution of budgeting and financial management, human resource management, acquisition and property management, information technology management, and administrative support services.

## SOCIOECONOMICS

The socioeconomic section is primarily focused on the effect of visitor spending on local economies and how the Seashore contributes to the tourism and travel economic impacts within the greater Corpus Christi region. A change in visitation to the Seashore that may result from a change in management policies associated with beach driving could have an effect – positive or negative – on the social and economic conditions of gateway communities within close proximity to the Seashore. Activities enjoyed by Seashore visitors are discussed in the “Visitor Use and Experience” section above.

The Seashore is accessible by various transportation modes – both motorized and non-motorized – from Corpus Christi via the JFK Causeway. Since the causeway in Corpus Christi is the primary access point for the Seashore, the majority of its visitors travel through and spend time and money in Corpus Christi and along Park Road 22. The possible economic effects from existing and proposed management plans are likely to be limited to the areas and communities within close proximity to Seashore. Therefore, the socioeconomic study area was defined as Nueces County, the county in which Corpus Christi is located. In addition to Nueces County, socioeconomic indicators were also collected for the Corpus Christi Metropolitan Statistical Area (MSA or area), the state of Texas, and the United States. Nueces County is part of the Corpus Christi MSA, along with Aransas and San Patricio Counties.

### SOCIOECONOMIC CHARACTERISTICS

The following section provides an overview of socioeconomic conditions in Nueces County. Information compares Nueces County to the Corpus Christi MSA, Texas, and in some instances the United States. This information was retrieved from the U.S. Department of Commerce Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, and the U.S. Census Bureau.

#### Population

As demonstrated in table 8, the population of Nueces County has increased at a slightly slower pace than the Corpus Christi area overall. The population of Nueces County, however, represents the majority of total MSA population or 80.9 percent. Nueces County and the Corpus Christi MSA have grown at a notably slower pace than the overall growth experienced in Texas. Nueces County grew at a similar pace as the United States between 1970 and 1990. Since that time, Nueces County has grown at a notably slower pace than the United States and Texas.

**TABLE 8. HISTORIC POPULATION AND CURRENT ESTIMATES FOR THE STUDY AREA AND AREAS OF COMPARISON (1970 TO 2008)**

Geographic Area	1970	1990	2008	% Change (1970-1990)	% Change (1990-2008)
Nueces County	238,729	291,669	320,319	22.2%	9.8%
Corpus Christi MSA	295,082	368,255	413,206	24.8%	12.2%
Texas	11,236,772	17,056,755	24,304,290	51.8%	42.49%
United States	203,798,722	249,622,814	304,374,846	22.5%	21.9%

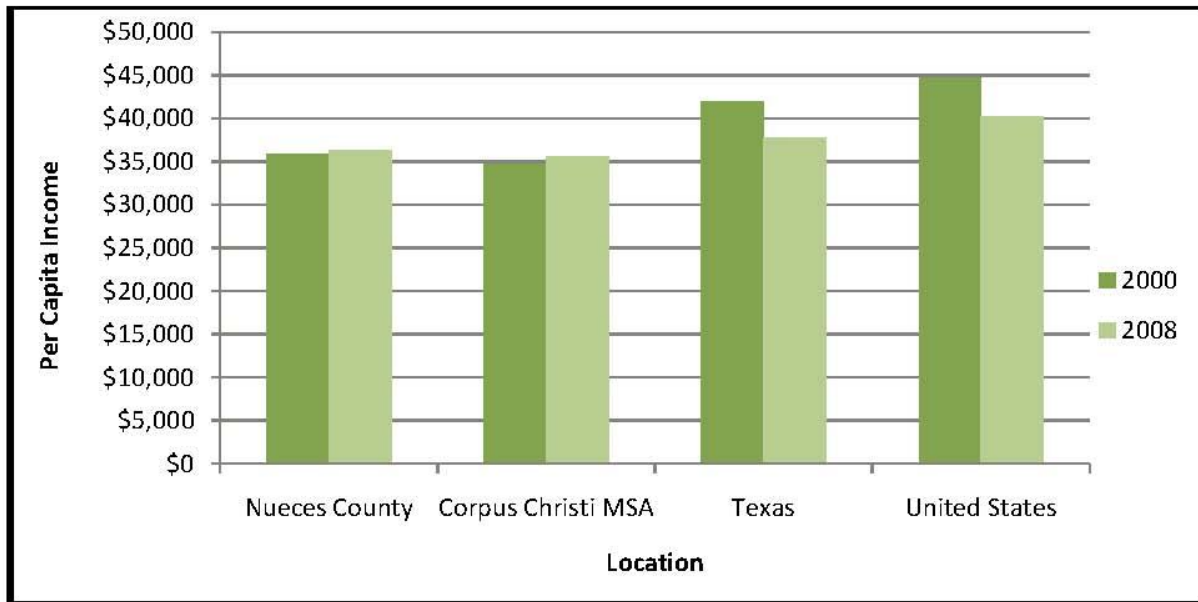
Source: U.S. Department of Commerce, Bureau of Economic Analysis 2010a.

Note: U.S. Census Bureau mid-year population estimates have been retrieved from the Bureau of Economic Analysis website.



## Per Capita Income

In both 2000 and 2008, the real per capita income in Nueces County was slightly higher than in the Corpus Christi area overall but was less than that of Texas and the United States (figure 22). In 2008, the per capita income in Nueces County was \$36,318 as compared to \$35,636 in the MSA. Between 2000 and 2008, real per capita in Nueces County increased by approximately 1.4 percent, while the Corpus Christi MSA experienced a similar increase of 2.7 percent. In contrast, both the state of Texas and the United States as a whole experienced a decrease in real per capita income of approximately 10.0 percent.



Source: U.S. Department of Commerce, Bureau of Economic Analysis 2010b; Executive Office of the President of the United States 2009.

Note: \*2000 per capita income was inflated to 2008 dollars with the Gross Domestic Product and Deflators used in the Historical Tables: 1940-2013. Executive Office of the President of the United States 2009.

**FIGURE 22. 2000 AND 2008 PER CAPITA INCOME FOR NUECES COUNTY, CORPUS CHRISTI MSA, TEXAS, AND THE UNITED STATES (IN 2008\$)**

## Employment by Industry

Data were obtained from the Bureau of Economic Analysis on total employment and employment by industry for Nueces County for 2001 and 2008. This information can be used to understand employment trends as well as current and important industries within the study area. A table showing employment for Nueces County as compared to the Corpus Christi area can be found in appendix B.

During the seven-year period, employment in Nueces County increased by 26,146 jobs or approximately 14.3 percent. In 2008, the three sectors that represented the most significant share of total county employment included retail trade (10.7 percent), health care and social assistance (12.8 percent), and government and government enterprises (15.0 percent). These sectors also represented the greatest share of total county employment in 2001. Between 2001 and 2008, all three of these sectors experienced increases in employment. Since 2008, national and regional economies have experienced a recession and unemployment rates are still very high in many regions. Therefore, it is likely that employment in these



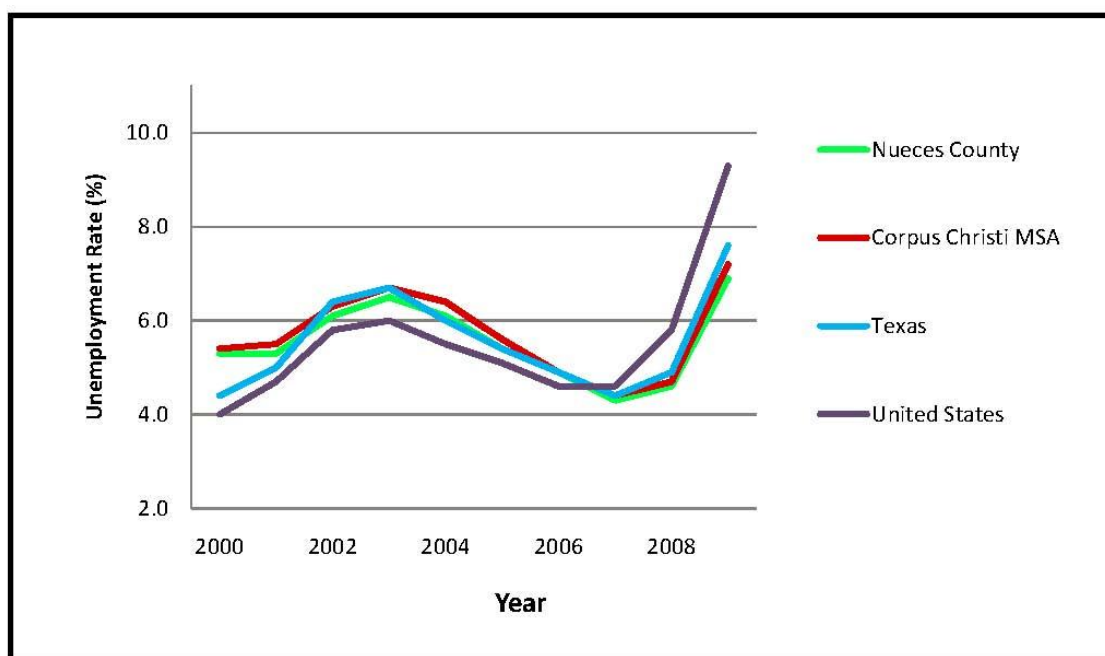
industries has decreased since 2008; however more current employment information is not available at this time.

The primary industries associated with travel and tourism include retail trade, arts, entertainment, and recreation, and accommodation and food services. Together, these sectors employed over 20 percent of the MSA workforce in 2008, employing over 50,000 people. These industries, together, have experienced 14.3 percent job growth since 2000. These industries serve both visitors and local residents. When reduced to account for only the visitor or tourism share of employment, it is estimated that these core tourism industries account for 13,000 jobs (Lee 2009).

Because Nueces County comprises almost 85 percent of the Corpus Christi employment in 2008, the area employment by industry is very similar to that of Nueces County. The information sector experienced the most significant decrease between the two periods, followed by utilities, agriculture, and manufacturing sectors. The government and government enterprises sector employs a greater share of area workers than the government employment share in Nueces County. Much of this employment can be associated with the Corpus Christi Naval Air Station and Texas A&M University – Corpus Christi.

## Unemployment

Annual unemployment rates from 2000 to 2009 for Nueces County, the Corpus Christi area, Texas, and the United States are summarized in figure 23. Unemployment in each geographic area was generally lower in 2000 and higher in 2009, all following the same basic trend. For each year, unemployment in Nueces County was less than or equal to that of the Corpus Christi MSA. Since 2007, unemployment has increased in all geographies. However, since 2007, Nueces County and Corpus Christi have experienced lower unemployment rates than both Texas and the United States; however, unemployment in Nueces County and the MSA increased by more than 2.0 percent between 2008 and 2009. In 2009, the unemployment rate in Nueces County was 7.6 percent.



Source: U.S. Department of Labor, Bureau of Labor Statistics 2010.

**FIGURE 23. 2000 TO 2009 UNEMPLOYMENT RATES FOR NUECES COUNTY AND AREAS OF COMPARISON**

## **ECONOMIC CONTRIBUTIONS TO LOCAL ECONOMIES**

The following section highlights the economic contribution of tourism in the Corpus Christi MSA. The Seashore offers a wide variety of activities, including nature viewing, fishing, and other recreational and nature experiences. As such, it is an important tourism destination for visitors to the region and visitors to the Seashore contribute to the economic activity to the region.

### **Economic Contribution of Tourism to the Corpus Christi Area**

A primary contributor to the Corpus Christi MSA economy is travel and tourism. The area is the sixth most popular tourist destination in Texas with more than 7.2 million visitors in 2008 with an average size party of 2.3 people (Lee 2009). People living in Texas represent more than 80 percent of this visitation. These leisure and business visitors spend more than \$1 billion on goods and services such as dining, lodging, local transportation, shopping, and recreation and entertainment (Lee 2009). Non-local visitor spending directly supports 13,000 jobs in core tourism industries in the Corpus Christi MSA (Lee 2009). Estimated daily spending per person was \$110.70 (Lee 2009). Visitor spending creates a multiplier or ripple effect in the local economy, as businesses provide goods and services to these tourism industries and employees spend their money in the local economies. In 2008, total economic contribution associated with the non-local visitor and travel spending supported \$1.2 billion in Gross Regional Product, \$457.5 million in wages and salaries, and 21,737 jobs (Lee 2009).

Nature tourism – which includes beach strolling, camping, bird and other wildlife watching, hiking and biking, hunting, fishing, and outdoor sports, and state and national parks visitation – accounted for almost 40 percent of all visitor trips to the area in 2008. Visiting state and national parks represents 11 percent of total visitor days to the MSA; the Seashore accounts for 52 percent of all state and national park visitation (Lee 2009). Including both direct and secondary (multiplier) effects, nature tourism contributes \$668.4 million in sales, \$371.7 million in Gross Regional Product, and 8,748 jobs to local economies (Lee 2009). Nature visitation economic contribution accounts for approximately 31 percent of total tourism-attributed Gross Regional Product and 40 percent of tourism-attributed employment. Approximately eight percent of nature spending, \$38.6 million, is associated with Seashore visitation (Lee 2009).

### **Contribution of Padre Island National Seashore to the Local Economy**

Visitation to the Seashore contributes to the local economy in several ways. It provides jobs to Seashore employees, including seasonal, term, and permanent full- or part-time positions. Seashore employees spend their income and wages in the local economies, which support additional jobs and income. In 2008, the Seashore employed 65 full- and part-time employees. These workers spend their income in the local economy, generally defined as a radius of 50 miles around the Seashore, which supports an additional 91 jobs for a total of 156 jobs (Stynes 2009). This payroll spending contributes to the Gross Regional Product, by an estimated \$4,896,000 million (Stynes 2009). The Seashore may also support the local economy if local vendors are used, through contracted construction services or purchases of supplies and materials, for example, although these figures are not assessed within this socioeconomic section.

The Seashore attracts a large number of visitors mostly from within Texas (Lee 2009). These visitors purchase from local businesses, such as restaurants, hotels, and retail outlets, during their visits in communities surrounding the Seashore, which contributes to local economies. The economic contribution of the visitor spending is a function of how many visitors arrive, and how much money they spend while visiting. In 2008, there were approximately 635,925 visitors – local and non-local – to the Seashore and total visitor spending associated with these visitors was estimated to be approximately \$43,838,000 (Stynes 2009). The Economic Significance of Tourism and Nature Tourism in Corpus Christi report (Lee 2009), which cites various sources for its calculations, estimates a similar but slightly lower annual visitor

spending in the amount of \$38.6 million. Based on total visitor spending and visitation, average daily spending per person is estimated to be \$68.94 (Stynes 2009).

An overwhelming percent of visitor spending (95.2 percent) is associated with non-local visitors (\$41,734,000). These visitors tend to spend more money visiting a region than do residents who visit a particular resource only for day trips. Local visitors living in nearby communities and their employment and household spending contributes to the economy; however, this contribution cannot be primarily associated with visits to the Seashore. Approximately 81 percent of visits to the Seashore are non-local visitors, coming from more than 50 miles away (Lee 2009). The total labor income generated by this spending was over \$16.6 million and the Gross Regional Product was \$25.8 million. One job is supported for every \$49,743.74 in non-local visitor spending. Thus, non-local visitor spending supports 839 jobs in communities surrounding the Seashore (Stynes 2009) in Nueces County or the larger metropolitan region.

Non-local visitor spending (\$41.7 million) associated with those visiting the Seashore accounts for approximately 4 percent of the Corpus Christi MAS's \$1 billion in tourism and travel spending, and similarly 4 percent (838 jobs) of the 21,737 tourism-related and supported jobs. Nueces County is estimated to host \$842.2 million in travel and visitor spending in 2009, approximately 84 percent of the \$1 billion spent in the three-county Corpus Christi MSA (Dean Runyan Associates 2010).

Total employment in Nueces County in 2008 was 208,899. Employment associated with the Seashore is estimated to be 156 (direct and indirect from Seashore employment), and 839 (from visitor spending), for a total of 995 jobs (Stynes 2009). This employment represents approximately 0.5 percent of total employment in Nueces county, and 0.2 percent of the Corpus Christi MSA employment.

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## **CHAPTER 4: ENVIRONMENTAL CONSEQUENCES**

### **METHODS FOR ANALYZING IMPACTS**

#### **GENERAL IMPACT ANALYSIS**

The NPS based the impact analyses and conclusions on data from existing literature, information and insights provided by experts in the NPS and other agencies, and professional judgment. For each impact topic, a description of relevant components of the existing condition is provided in “Chapter 3: Affected Environment.” This information is then used as a basis for determining the effects of implementing each alternative. The impact analyses involved the following steps.

- Define issues of concern, based on internal and public scoping.
- Identify the geographic area that could be affected.
- Define the resources within that area that could be affected.
- Apply the alternative to the resources within the geographic area of potential effect.
- Identify the effects caused by the alternative, in comparison to “Alternative 1: No Action,” to determine the relative change in resource conditions. Characterize the effects based on the following factors:
  - Whether the effect would be beneficial or adverse.
  - The intensity of the effect, as negligible, minor, moderate, or major. Impact-topic-specific intensity definitions for each of these intensities are provided in each impact topic methods section. Intensity values were developed based on federal and state regulations and standards, NPS policies, and discussions with subject matter experts. In all cases, the impact definitions are defined for adverse impacts; beneficial impacts are addressed qualitatively.
  - Duration of the effect, either short-term or long-term. Impact-topic-specific intensities for each of these durations are provided in each impact topic methods section.
  - The area affected by the alternative, such as a localized area within the Seashore.
  - Whether the effect would be a direct result of the action or would occur indirectly because of a change to another resource or impact topic. Direct and indirect impacts need to be considered but not explicitly labeled in the analysis.
- Determine cumulative effects by evaluating the effect in conjunction with past, present, or reasonably foreseeable future actions for Padre Island National Seashore and the immediate vicinity.

#### **CUMULATIVE EFFECTS SCENARIO AND ANALYSIS**

Sections 1508.7 and 1508.25 (a)(2) of the CEQ (1978) regulations for implementing NEPA require assessment of cumulative effects in the decision-making process for federal actions. Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects are considered for the no action alternative and all action alternatives.

As explained in the NPS guidance on environmental impact analysis (NPS 2001a, Director's Order 12), the intent is to determine the additive impact of the alternative on each resource of concern. It states "It is irrelevant who takes these actions (i.e., they are not confined to NPS or even federal activities), or whether they took place in the past, are taking place in the present, or will take place in the reasonably foreseeable future."

Cumulative effects were determined by combining the effects of each alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions at Padre Island National Seashore and in the surrounding region. The following identifies other plans and relevant projects in and around the Seashore that could contribute to cumulative impacts on the resources and values assessed in this EA.

Impact Topic	Past Actions	Present Actions	Future Actions
Wildlife	<ul style="list-style-type: none"> <li>Colonial Waterbird Management Plan</li> <li>Bird Monitoring</li> <li>Beach debris and clean-up</li> <li>Oil and Gas Management Plan and Operations</li> <li>Kemp's Ridley Sea Turtle Recovery Program (patrols)</li> </ul>	Same as past (plan implementation and continuation of actions)	Same as present
Special-status Species	<ul style="list-style-type: none"> <li>Kemp's Ridley Sea Turtle Recovery Program</li> <li>Colonial Waterbird Management Plan</li> <li>Bird Monitoring</li> <li>Beach debris and clean-up</li> <li>Oil and Gas Management Plan and Operations</li> </ul>	Same as past	Same as present plus: <ul style="list-style-type: none"> <li>Addition of down island turtle cabins</li> </ul>
Visitor Use and Experience	<ul style="list-style-type: none"> <li>Beach debris and clean-up</li> <li>Kemp's Ridley Sea Turtle Recovery Program</li> <li>Oil and Gas Management Plan and Operations</li> <li>Prescribed burns</li> </ul>	Same as past	Same as present
Visitor and Employee Safety	<ul style="list-style-type: none"> <li>Fire Management Plan and burns</li> <li>Beach debris and clean-up</li> <li>Smuggling Incidents</li> </ul>	Same as past	Same as present plus: <ul style="list-style-type: none"> <li>Proposed monopole communication tower at headquarters for Department of Homeland Security (DHS)</li> </ul>
Park Operations	<ul style="list-style-type: none"> <li>None</li> </ul>	None	Acquisition of Texas General Land Office (GLO) Lands north of the Seashore
Socioeconomics	<ul style="list-style-type: none"> <li>Local and Seashore programs that increase visitation, including beach cleaning and sea turtle recovery program</li> <li>Smuggling Incidents</li> <li>National economic conditions</li> </ul>	Same as past	Same as present

### **Kemp's Ridley Sea Turtle Recovery Program**

The NPS leads a cooperative program to detect, study, and protect nesting Kemp's ridley sea turtles and sea turtle nests on North Padre Island, including the Seashore. This program is made possible due to funding from the federal government, Texas Parks and Wildlife Department, and a variety of partners and donors.

Under this program, the Seashore has and will continue to actively manage and protect the Kemp's ridley sea turtle. Actions under this program include daily and camping patrols to detect and protect nesting during the spring and summer, conduct research on the Kemp's ridley, and locate stranded sea turtles for documentation, rehabilitation, and study. Approximately 55 percent of Kemp's ridley nesting in the United States occurs on Padre Island (Shaver 2010a). In 2009, 117 Kemp's ridley nests were located at the Seashore. Nesting has been increasing and according to population modeling this trend is expected to continue (NMFS, USFWS, and SEMARNAT 2010). Eggs are removed from the beach and transferred to an incubation facility or a corral at the Seashore to protect them and resulting hatchlings from a variety of natural and human-related threats, including beach driving. Up to 120 volunteers assist annually with beach patrols for nesting turtles, protection and care for nests, and release of hatchlings.

Under this program hatchling release activities are popular with Seashore visitors from around the world. This ecotourism event attracted more than 4,000 visitors that attended in 2010 and numbers are growing (NPS 2001c).

### **Sea Turtle Cabins and Corrals**

Currently there are plans to expand the existing incubation facility and to construct two new cabins down island to provide sleeping accommodations for turtle monitors, and construct new corrals on the beach. These new facilities would increase the existing 290 nest capacity (incubation facility – 250 nests, one corral – 40 nests) to 700 nests (incubation facility – 500 nests, two corrals – 200 nests) with the ability to further expand the new corrals in the future, and provide the ability of turtle monitors to patrol down island in a more timely manner (Shaver 2010g; NPS 2010e). While the number of Kemp's ridley sea turtles nesting at the Seashore is expected to continue to increase as the overall worldwide population continues to grow, the length of the nesting season is dependent on local weather conditions and other factors being conducive to nesting. Variability of weather from year to year may extend or shorten the nesting season in the future. The cabins would provide accessible shelter for sea turtle patrollers during storm events and would reduce the number of miles needed to be driven to reach the ends of the patrol routes, and thus enhance the ability to effectively patrol the Seashore's beach down island. The corrals located at the cabins will reduce the stress on eggs currently transported long distances on the beach to incubation facilities, continuing to ensure that eggs are successfully hatched as nesting continues to increase and the number of nests that must be transported increases. The Section 7 consultation for this project was completed in January 2011 (Biological Opinion signed January 19, 2011), and the EA was completed with the signing of a Finding of No Significant Impact on February 22, 2011.

### **Colonial Waterbird Management Plan**

This plan was developed as a portion of the USACE environmental impact statement (EIS) addressing maintenance dredging of the Gulf Intracoastal Waterway (USACE 2003). The plan highlights management options for the dredge-material islands in Laguna Madre, including possible predator control of coyotes and raccoons, habitat improvements, continuation of rookery monitoring, and conducting prescribed fires.

## **Bird Monitoring**

The Seashore participates in regular bird monitoring to assess the seasonal use of migratory species, numbers and locations of shorebirds and waterbirds, and presence of sensitive or special-status avian species. This includes use of vehicles along the beach.

## **Fire Management Plan and Prescribed Burns**

Park staff have recently completed a fire management plan for the Seashore, which includes restoring fire to the coastal prairie in the island's interior. An EA was prepared in 2006 to update the current 2004 fire management plan, and to address wildfire use and a prescribed fire program. Under the current fire management plan, the Seashore also plans to conduct prescribed burns and hazardous fuel reduction projects across the northern portion of the Seashore.

## **Oil and Gas Management Plan and Oil and Gas Operations on Padre Island National Seashore and General Land Office Lands**

All subsurface mineral interests underlying the land within the Seashore were retained by private owners. Those underlying the submerged lands in Laguna Madre and the Gulf of Mexico were retained by the state of Texas and are administered by the Texas GLO. NPS manages the exercise of nonfederal oil and gas rights under 36 CFR 9.30, et seq. according to its Oil and Gas Management Plan. Oil and gas drilling and production equipment and associated vehicles are escorted down the beach to reach sites behind the dunes; occurrence is variable and dependent on demand/oil and gas development in the area. Oil and gas prices have increased substantially over the past eight years, resulting in increased exploration and development activities at the Seashore. As of January 19, 2011, there are 14 operational wells in the Seashore. Drilling and permitting are ongoing, and an additional three wells have been permitted, but not yet developed (Stablein 2011).

## **Beach Debris and Clean-Up**

Marine debris arrives at the Seashore from many sources including the Mississippi River, storms, commercial shrimping industry, offshore oil and gas industry, Mexico, and many other sources. With over 65 miles of shoreline and no road behind the dunes, removing trash is an immense task for Seashore staff. The Seashore relies heavily on volunteer groups from the general public for assistance. Periodic, organized efforts are sponsored by local visitor groups, and can include use of dump trucks to remove large debris items. The Seashore also participates in statewide beach clean-ups and the Adopt-a-Beach program. Beach cleaning operations routinely occur to remove *Sargassum* along an approximately 500-yard stretch of Malaquite Beach closed to beach vehicles; an EA is currently underway to address this activity. The Seashore also performs frequent patrols to locate, document, and remove containers of hazardous waste.

## **Smuggling Incidents /Border Patrol**

Human smuggling is of concern at this border park, and border protection protocols have been put in place to help address this issue. A new Law Enforcement building has been proposed and is currently being analyzed in an EA.

### **Proposed Monopole Construction at Park Headquarters**

The DHS has proposed installing a 300 foot communications tower within the Seashore boundary to better support communications and national security. If developed, the National Seashore would dismantle the current tower and move all Seashore communications to the DHS tower.

### **Maintenance Dredging of the Gulf Intracoastal Waterway, Laguna Madre**

An EIS was completed for maintenance dredging of the Gulf Intracoastal Waterway through Laguna Madre (USACE 2003). This maintained channel is a portion of an intracoastal system that extends from Brownsville, Texas to Carabelle, Florida. The EIS details when and where maintenance dredging will occur in Laguna Madre, along with the resulting impacts. Maintenance dredging results in the creation of dredge-material islands, some of which occur within the Seashore. Dredge material is also periodically added to some of these islands, which can alter the islands and existing plants and animals. Within the Seashore, USACE plans to re-create at least two islands that have eroded away in the past 20 years. This would occur if and when the adjacent reaches of the waterway are dredged.

### **Dredging of Mansfield Channel**

Mansfield Channel is a cut through Padre Island that forms the southern boundary of Padre Island National Seashore. Since its completion in 1962, the channel has provided access from the town of Port Mansfield to the fishing and recreational opportunities of the Laguna Madre, the Gulf Intracoastal Waterway, and the Gulf of Mexico. Dredging and maintenance of Mansfield Channel is provided periodically by the USACE, although the current frequency and extent has not been determined.

### **Potential Acquisition of Texas General Land Office Property North of the Seashore**

The NPS has been working cooperatively with the state of Texas GLO and the Nature Conservancy over the past several years to acquire the approximately 3,800 acres of GLO land that abuts the Seashore's northern boundary. The parcel is undeveloped and provides similar beach and inland conditions to those in the Seashore. If acquired, the parcel would add to the undeveloped acreage of North Padre Island, and would be protected from development into perpetuity.

## **VISITOR AND EMPLOYEE SAFETY**

### **METHODS AND ASSUMPTIONS**

The analysis of public safety considers risks to NPS staff and the general public that are associated with beach driving and the proposed speed limit restrictions.

### **Study Area**

The study area for visitor and employee safety is within the North and South Beach portions of the Seashore.

### **Impact Definitions**

The following definitions were used to assess the intensity of adverse impacts on Seashore visitor and employee safety and duration of impacts. Where impacts on safety become moderate, it is assumed that



current visitor satisfaction and safety levels would begin to decline, and some of the Seashore's long-term visitor goals would not be achieved.

*Negligible:* Impacts on safety would not be measurable or perceptible.

*Minor:* Impacts on safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors or employees at localized areas. Mitigation could be needed, but would be relatively simple and likely to be successful.

*Moderate:* Impacts on safety would be sufficient to cause a change in accident rates at existing low accident locations or in areas that currently do not exhibit noticeable accident trends. Mitigation measures would probably be necessary and would likely be successful.

*Major:* Impacts on safety would be substantial. Accident rates in areas usually limited to low accident potential would substantially increase in the short and long term. Extensive mitigation measures would be needed, and success would not be guaranteed.

*Duration:* All impacts would be long-term beginning after the implementation of the selected alternative.

## IMPACTS OF ALTERNATIVE 1: NO ACTION

Under alternative 1, the speed limits would remain at 15 mph between mile marker 0 and 2.5 and then increase to 25 mph until Mansfield Channel. Accident rates would not be expected to change, with the majority of accidents occurring between miles 0 and 20. Accident rates would be expected to continue to be lower beyond mile 21, where visitors are more widely dispersed and not as numerous. Overall, implementation of alternative 1 would continue to result in long-term minor adverse impacts on visitor and employee safety within the first 20 miles of the beach and long-term negligible adverse impacts from miles 21 to 60.

## Cumulative Impacts

Past, present, and future projects at Padre Island National Seashore that would provide beneficial impacts on visitor and employee safety include the fire management plan, the proposed monopole communication for DHS at headquarters, and beach debris clean-up efforts. These projects would result in long-term beneficial impacts on safety for Seashore visitors and employees. Smuggling incidents have the potential for long-term minor to moderate adverse impacts on visitor and employee safety within the Seashore. When combined with the long-term negligible to minor adverse impacts under alternative 1, cumulative impacts would be long-term negligible adverse.

## Conclusion

Under alternative 1, the current accident rates and trends would remain, resulting in long-term negligible to minor adverse impacts on visitor and employee safety. Cumulative impacts on visitor and employee safety would be long-term negligible adverse.

## **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

Under alternative 2, fewer accidents would be expected during the seasonal speed limit restriction. The accident rate from mile 0 through 2.5 would not be expected to change, as the speed limit would remain at 15 mph year-round. At lower speeds, the stopping distance for beach drivers in a potential accident situation would be expected to be shorter (Green 2009).

Stopping distance is related to two variables: reaction time and braking distance. Reaction time is the time it takes to see a hazard, process that it is a hazard, and begin the process of avoiding that hazard (i.e., apply the brakes). The braking distance is the distance a vehicle travels once the brakes are applied before it comes to a stop.

Reaction time is a complicated topic and is affected by a large number of variables including, among other factors, age, visibility (which is affected by characteristics of the object being reacted to, the vehicle, and the environment), cognitive load (i.e., the number of driving and non-driving matters that are consuming a driver’s attention), mental processing time, movement time (e.g., time to move a foot from the accelerator to the brake and begin depressing the brake), and device response time (brakes do not engage instantaneously the moment a driver’s foot touches the brake pedal). While there is no single universal reaction time value, a best estimate for a surprised driver under daylight and good visibility conditions is 1.5 seconds. This time may be shorter if the driver is alert and aware that he may need to brake, or longer depending on circumstances surrounding the need to brake (Green 2009).

In 2009, the Seashore conducted a braking distance study to determine the distance it would take for a vehicle driving on the beach to stop on both wet and dry sand. The study showed that braking distance decreased substantially (by more than one half) with decreased vehicle speed. A reduction in speed from 25 mph to 15 mph reduced the average breaking distance from 52.5 feet to 21.0 feet (NPS 2009c). Adding to this the reaction time distance (i.e., distance traveled from the time a hazard is recognized to when the brakes are applied; 1.5 seconds multiplied by 22 feet/second or 33 feet for 25 mph and 1.5 seconds multiplied by 36.7 feet/second or 55 feet for 15 mph), the study found the overall average stopping distance for a vehicle traveling on the beach at 25 mph and 15 mph to be 107.5 feet and 54 feet, respectively. Therefore, traveling at 15 mph allows a vehicle to stop on average in approximately one-half the distance as compared to traveling at 25 mph.

Beyond mile marker 2.5, the decreased stopping distance for drivers operating at 15 mph would be expected to result in fewer accidents along South Beach for accidents where speed is a contributing factor. At lower speeds, the kinetic force of a collision would also be reduced, which could result in less damage to vehicles. The seasonal restrictions under alternative 2 would reduce the speed limit during some of the peak periods of visitor use, including Memorial Day weekend and the Fourth of July, to 15 mph.

The decreased accident rate would be expected to be most noticeable from mile marker 2.5 through mile marker 20, where about half of accidents are currently occurring, resulting in localized long-term beneficial impacts on human health and safety. Stopping distance along the entire length of the Seashore would be decreased, potentially reducing accidents southward to the Mansfield Channel, resulting in long-term beneficial impacts from mile 2.5 through 60.

During the public scoping period, concerns were received regarding getting stuck in soft sand at lower speeds, more driving on beach at night, and driver fatigue from longer driving periods. NPS staff has not experienced employee or visitor vehicles getting stuck in soft sand at lower speeds. However, if these

concerns were to be realized, there would be the potential for long-term minor adverse impacts for those drivers recreating farther down island or in soft sand.

The seasonal restrictions under alternative 2 would also occur during a portion of the peak visitor use period, and therefore peak months for accidents, and would be expected to contribute to a reduced accident rate during those months. The 100 yard safety zone element would be expected to contribute to the reduced accident rate year-round, as drivers would be required to slow to 15 mph when approaching other vehicles, pedestrians, camp sites, pets, or wildlife. The safety zone element would decrease the driver stopping distance around Seashore employees, other Seashore users and, therefore, increase the safety of both those visitors and employees inside and outside of their vehicles on the beach. As demonstrated by the stopping distance tests conducted at the Seashore discussed above, the 100 yard safety zone is sufficiently long to enable a vehicle traveling at 15 mph to stop in soft sand. Outside of the reduced speed period, the possibility would still remain for employees and visitors to strike buried or undetected hazards at 25 mph.

Overall, alternative 2 would be expected to result in long-term beneficial impacts, as well as potential long-term minor adverse impacts on visitor and employee safety year-round by implementing a seasonal speed limit restriction and year-round safety zone element.

### **Cumulative Impacts**

Effects to visitor and employee safety from cumulative actions would be the same as described under alternative 1, which include long-term minor to moderate adverse as well as beneficial impacts. When combined with the long-term beneficial and long-term potential minor adverse impacts from alternative 2, cumulative impacts would be long-term beneficial.

### **Conclusion**

Under alternative 2, seasonal speed limit reductions would result in long-term beneficial impacts on visitor and employee safety along South Beach due to the implementation of a safety zone, shorter stopping distances at lower speeds, and an expected decrease in accident rates as well as potential long-term minor adverse impacts on visitor and employee safety. Cumulative impacts on visitor and employee safety would be long-term beneficial.

### **IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Impacts on visitor and employee safety would be expected to be similar to alternative 2, with long-term beneficial impacts on human health and safety due to shorter stopping distances at slower speeds. Alternative 3 would be more beneficial; however, as it would require lower vehicle speeds for a longer period of time, which would include all peak-use holidays, including Spring Break, Memorial Day, Fourth of July, and Labor Day weekends. Visitor and employee use of the beach is greatest during this time.

Unlike alternative 2, alternative 3 would not include a safety zone element and, therefore, would not change the existing accident rates outside of the seasonal restriction. However, the 25 mph speed limit would be in place during the winter months when accident rates are lower due to lower visitor and employee use. Overall, alternative 3 would be expected to result in long-term beneficial impacts from the reduction in vehicle speeds during peak visitor and employee use periods, and potential long-term minor adverse impacts on visitor and employee safety from the potential of getting stuck in soft sand at lower speeds, more driving on beach at night, and driver fatigue from longer driving periods.

## **Cumulative Impacts**

Effects to visitor and employee safety from cumulative actions would be the same as described under alternative 1, which include long-term minor to moderate adverse as well as beneficial impacts. When combined with the long-term beneficial impacts and localized, long-term potential minor adverse impacts from alternative 3, cumulative impacts would be long-term beneficial.

## **Conclusion**

Similar to alternative 2, seasonal speed limit reductions under alternative 3 would result in long-term beneficial impacts on safety along South Beach due to shorter stopping distances at lower speeds and an expected decrease in accident rates as well as long-term potential minor adverse impacts but would be more beneficial due to lower speed limits during all peak use periods. Cumulative impacts on visitor and employee safety would be long-term beneficial.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Impacts on visitor and employee safety would be expected to be similar to alternative 2, with long-term beneficial impacts on visitor and employee safety due to decreased stopping distance at slower speeds. Alternative 4 would not include a safety zone element, but the 15 mph speed limit would be in place year-round, providing annual protection for employee and visitor safety and eliminating the need for a safety zone element. The benefits of reduced stopping distance would occur at all times and extend the full beach length. The potential for localized, long-term minor adverse impacts from getting stuck in soft sand at lower speeds, more driving on beach at night and driver fatigue from longer driving periods would also be present if drivers experienced these while recreating farther down island.

Overall, alternative 4 would be more beneficial than alternatives 2 and 3, with long-term beneficial impacts from the reduction in vehicle speeds year-round and the potential for long-term minor adverse impacts.

## **Cumulative Impacts**

Effects to visitor and employee safety from cumulative actions would be the same as described under alternative 1, which include long-term minor to moderate adverse as well as beneficial impacts. When combined with the long-term beneficial impacts and potential localized, long-term minor adverse impacts from alternative 4, cumulative impacts would be long-term beneficial.

## **Conclusion**

Annual speed limit reductions under alternative 4 would result in long-term beneficial impacts on safety along South Beach due to shorter stopping distances at lower speeds and an expected decrease in accident rates as well as long-term potential minor adverse impacts. Benefits would be greater than expected under alternatives 2 or 3, based on having a reduced speed and associated reduced stopping distance year-round for the entire Seashore. Cumulative impacts on visitor and employee safety would be long-term beneficial.

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## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTIONS A AND B**

Alternative 5 would implement a 100-foot safety zone element year-round but would not alter the speed limit along South Beach otherwise. Alternative 5 would reduce vehicle speed to 15 mph when the vehicle is within 100 feet of a pedestrian, parked vehicle, pet, structure, or campsite and, therefore, would reduce the vehicle stopping distance in those situations. Alternative 5 would reduce the year round potential for vehicles to strike a pedestrian, campsite, or pet (and wildlife under Option B), but would not reduce the potential for a vehicle collision involving two or more moving vehicles, as drivers would not be required to slow when passing another vehicle. Similar to alternatives 2 and 3, alternative 5 would not decrease incidents or severity for undetected hazards. Alternative 5 may not allow for enough stopping distance to avoid a collision, as indicated by stopping distance tests conducted at the Seashore. Accident rates would be expected to decrease, especially from mile marker 2.5 to 20, where pedestrians, parked vehicles, campsites, and pets would be more prevalent. Alternative 5 would be expected to reduce accident rates for single vehicle accidents where speed is a factor, such as rollover incidents which occur along the Seashore. Since drivers would not be required to slow down when approaching another moving vehicle, multiple vehicle accident rates would not be expected to change. Overall, impacts on visitor and employee safety under alternative 5 would be long-term beneficial, although not as beneficial as the alternatives with a reduced speed limit during high use periods where the reduction in speed is not as dependent on the perceptions of the driver.

### **Cumulative Impacts**

Effects to visitor and employee safety from cumulative actions would be the same as described under alternative 1, which include long-term minor to moderate adverse as well as beneficial impacts. When combined with the long-term beneficial impacts from alternative 5, cumulative impacts would be long-term beneficial, although slightly less beneficial than other action alternatives because of the lesser contribution of alternative 5 based on speed and stopping distance.

### **Conclusion**

Implementation of a 100-foot safety zone under alternative 5 would result in result in long-term beneficial impacts on visitor and employee safety along South Beach due to shorter stopping distances at lower speeds when in the presence of parked cars, pedestrians, campsites, pets, and, under Option B, wildlife. Benefits would be less than expected under the other action alternatives, since this alternative would not have reduced speeds and associated reduced stopping distance during any continuous period of time, especially higher use months. Cumulative impacts on visitor and employee safety would be long-term beneficial.

## **WILDLIFE**

### **METHODS AND ASSUMPTIONS**

Impacts on wildlife resources were determined by considering the effect of the existing conditions and the proposed speed limit changes. Potential impacts on wildlife populations and habitat were evaluated based on available Seashore research, other Seashore plans, scientific literature, life history, and available scientific studies on the impacts of human disturbance on wildlife, the Seashore's approved Oil and Gas Management Plan, and consultation with other permitting agencies.

## Study Area

The geographic study area for wildlife resources is within the North and South Beach portions of the Seashore.

## Impact Definitions

The following definitions were used to assess the intensity and duration of adverse impacts on wildlife resources:

- Negligible:* Impacts on wildlife species, their habitats, and the natural processes sustaining them would be at or below the level of detection. There would not be any measurable or perceptible effects on wildlife populations.
- Minor:* Detectable impacts on wildlife or their habitats would occur within a small area but would not result in substantial changes in populations or the natural processes, such as competition and dispersal that sustain them. While the mortality of individual animals might occur, population effects would be within the range of natural variation, and the viability of wildlife populations would not be affected. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
- Moderate:* Readily detectable impacts outside the range of natural variability would occur on wildlife populations, their habitats, or the natural processes sustaining them. The change would be measurable in terms of population abundance, distribution, quantity, or quality and would occur over a relatively large area. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.
- Major:* Readily apparent impacts outside the range of natural variability would occur on wildlife populations, their habitats, or the natural processes sustaining them. The change would be measurable in terms of population viability and could involve the displacement, loss, or restoration of a wildlife population or assemblage. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.
- Duration:* Short-term: Those impacts occurring over the course of year.
- Long-term: Those impacts occurring over more than one year.

## IMPACTS OF ALTERNATIVE 1: NO ACTION

Under alternative 1, the speed limit would be a continuation of the management policies prior to the temporary seasonal restrictions implemented in 2009, 2010 and 2011. The speed limit would continue to be 15 mph on North Beach and from mile marker 0 to 2.5 on South Beach, and 25 mph from the 2.5 mile marker to Mansfield Channel.

## Mammals

Beach driving can result in strikes and injury or mortality of individual mammals. However, the impacts may not necessarily be directly attributable to a specific vehicle speed, and the NPS is not aware of any studies that have been conducted relating impacts on beach dwelling mammals to vehicle speeds. Many of the mammalian species are large enough to readily see from a long enough distance (e.g., deer, coyotes), to allow drivers time to slow down and avoid striking the animal. Additionally, mammals are mobile and may be able to move out of the way of an approaching vehicle on their own; however, the sound of approaching vehicles is often muffled by the sound of the surf and winds, and some animals are still struck. During the past decade (2000-2009), there has been one documented vehicle collision with a deer at the Seashore (NPS 2009c). However, according to Seashore staff, there are typically two to three accidents reported each year where either deer or coyotes have been hit by vehicles on the beach and others are struck but go unreported (Lindsay 2011a). Although individual mammals may on occasion be injured or killed, these impacts would have no community or population level effects. In addition, beach driving would continue to result in short-term movement of mammals using the shoreline for foraging or resting. Mammals that dwell near the beach would be displaced temporarily upon vehicle approaches, but could still readily return to their pre-disturbance behavior. The combination of injury and mortality with disturbance to resting or foraging mammals would result in localized, short- and long-term negligible to minor adverse effects on mammals.

## Invertebrates

Vehicle use along the intertidal zone would continue to have adverse impacts on invertebrate populations, due to mortality of individual species caused by crushing, rutting, and compaction under vehicle tires. Access to the intertidal zone often requires vehicles to cross over the *Sargassum* wrack line, which is normally deposited within the beach driving corridor and is an area of high concentrations of invertebrates. Vehicles driving on the beach disturb the wrack line where many invertebrates reside and can crush, scatter, or bury invertebrates. Studies have shown that vehicles driving on the beach and through the wrack line adversely impact the number of invertebrates on the beach (Kluft and Ginsberg 2009; Leatherman and Godfrey 1979). Of all beach recreational activities, beach driving has the greatest adverse impact on ghost crabs and other invertebrates (Schlacher et al. 2007). During daylight hours, all shallowly buried ghost crabs can be killed by 10 vehicles passes, with burrow depths in excess of 30 centimeters (1 foot) required to protect from vehicle travel. After dusk, when ghost crabs emerge from their burrows, a single passing vehicle may kill 0.75 percent of the population on a beach (Schlacher et al. 2007). In addition, long-term exposure to vehicle travel and human trampling can reduce the number of burrows (and the associated number of ghost crabs) by over 50 percent, compared to undisturbed stretches of beach (Schlacher and Lucrezi 2009).

At Padre Island National Seashore, vehicle traffic along the Gulf beach is concentrated north of the 10 mile marker, with over 50 percent of the visitors to the ocean beach remaining north of that location (Scott and Lai 2004). Thus, the heaviest impacts on shoreline invertebrates would be expected in mile 0 to 10. Moving southward on the beach, traffic would be less frequent, and impacts on invertebrates would be expected to be less. While impacts on invertebrates would be greater in locations where vehicle traffic is particularly heavy (i.e., mile marker 0 – 10), given the length of the Gulf beach, the fewer number of vehicles traveling south along the majority of the beach (i.e., south of mile marker 10), the large amount of *Sargassum* on the beach, and the limited amount of night driving, the overall impact on invertebrates at the Seashore from beach vehicle use would be long-term minor adverse.

## Birds

Human disturbance within beach habitats can arise primarily from the presence of vehicles and pedestrians (Pfister et al. 1992; Holmgren et al. 1993; Post and Browne 1976). The presence of moving vehicles can result in mortality from birds being run over and from colliding with vehicles. Vehicles and pedestrians can also result in birds flushing and thereby being kept from foraging and resting within preferred habitats (Lafferty 2001a, 2001b). When birds are kept from food resources or when their resting is replaced by fleeing, they can become energetically compromised. Shorebirds are at particular risk since they are some of the longest distance migratory birds and, as such, the energy demands of migration are extreme (Goss-Custard 1984; Harrington et al. 1991). During migration, shorebirds expend large amounts of energy during the long flights between winter and summer habitats (Sibley 2001). They use a variety of habitats to refuel, rest, and avoid predators, and their survival is in part a function of the calories that individual shorebirds add by way of efficient foraging and the calories that shorebirds preserve during resting (Kersten and Piersma 1987).

Of particular concern to migratory birds is when disturbance results in birds being forced to flush while they are foraging or resting. Frequent escape flights result in a reduction in time spent foraging and a reduction in fuel stores spent during times of flying. A recent study on vehicle disturbances and wading birds supports the effects of passing vehicles on bird foraging behavior (Stolen 2003). Stolen found that disturbances to birds decreased foraging rates, which in turn reduced the net rate of energy intake by the birds. Because foraging is replaced with flushing, birds that are frequently disturbed might not be able to add the body fat they need to survive long flights over land and over the Gulf of Mexico on route to their wintering grounds in South America and the Caribbean. The level of impact this causes is dependent upon the species and the level of disturbance.

The scientific literature indicates that disturbance to birds is highly distance dependent (Rodgers and Schwikert 2003). Birds have a threshold flushing initiation distance that when exceeded, causes them to shift from resting and feeding behavior to running or flying away from the disturbance (Lafferty 2001a). The flushing initiation distance varies between and within species. For example, American oystercatcher is known to transition from feeding or resting to fleeing when an intrusion is several hundred feet away (Nol and Humphrey 1994), whereas smaller birds will flush from resting or feeding sites only when an intrusion occurs within 120 feet (Lafferty 2001a). Distance and encroachment are the known primary variables, whereas the role of other variables, such as speed at which an intruding person or vehicle are believed to be of secondary importance.

Within the Seashore, Chaney et al. (1993) observed fewer species of shorebirds at the northern and southern end of the Gulf beach area open to vehicles and attributed this to traffic and human (e.g., campers and fisherman) disturbance. However, they also found that that in spite of a higher concentration of human disturbance at the northern end of the beach, certain species of shorebirds; snowy plover, piping plover, black-bellied plover (*Pluvialis squatarola*), willet and ruddy turnstone (*Arenaria interpres*), were not deterred from feeding or resting on the beach. Chaney et al. (1993) also observed that for almost all species of shorebirds, those on the northern 10 miles of the beach, where vehicle traffic was more prominent, appeared to be acclimated to repeated vehicular disturbances and tended to remain on the beach when a vehicle approached. In contrast, birds in areas with less vehicle traffic tended to flush more easily.

While some species may be deterred from using the northern and southern end of the Gulf beach due to disturbance from vehicles and humans, there may be ample habitat throughout the rest of the Gulf beach that is suitable for foraging and resting to minimize the overall impacts on shorebirds. Additionally, birds located further down island would also encounter fewer disturbances due to lower densities of vehicles. While no official vehicle counts are kept for down island travel, Seashore staff conducted counts of



vehicles traveling past specific locations (both in a northerly and southerly direction) south of mile marker 20 over the course of six weekends from May 2010 through September 2010. During the observation periods, which included Memorial Day weekend, Independence Day weekend, and Labor Day weekend, vehicle counts ranged from 0.5 to 2.1 vehicles per hour (Lindsay 2010).

Though continued beach driving would result in repeated, short-term flushing of bird species using the shoreline for foraging or resting, these impacts would be minimized by the overall amount of Gulf beach habitat available to birds within the Seashore and the minimal amount of disturbance by vehicles that birds would encounter down island. In addition to directly disturbing the birds, crushing of and disturbance to the wrack line by vehicles and the resulting reduction in invertebrate populations would continue to diminish and disperse an important source of food and habitat for many birds. The repeated disturbances from vehicles and the loss of foraging opportunities would result in short- and long-term minor adverse effects on birds.

### **Cumulative Impacts**

Other past, present, and future planned actions within the Seashore would continue to have the potential for both beneficial and adverse impacts on wildlife within the Seashore. Existing and future beach clean-up activities, Kemp's ridley sea turtle recovery plan activities, bird monitoring, and oil and gas operations in the Seashore often require vehicles to drive down the ocean beach. Potential impacts from these vehicles include, but are not limited to, potential collisions resulting in injury and death, sand compaction and invertebrate mortality, disturbance and dispersal of the wrack line, and flushing associated with the approach of vehicles. However, the number and frequency of vehicles used for these efforts would be minimal compared to those used by Seashore visitors. Regarding invertebrates, these activities do not occur at night when ghost crabs out of their burrows and are most vulnerable. In addition, the Seashore has a programmatic Oil and Gas Management Plan (NPS 2001b) that provides management strategies and mitigation measures to minimize the potential impacts of oil and gas operations on wildlife, including driving at a speed of 15 mph.

Beach cleaning operations routinely occur to remove *Sargassum* along an approximately 500-yard stretch of Malaquite Beach closed to beach vehicles; an EA is currently underway to address this activity, which removes important habitat for invertebrates. However, given the relatively small area of the Seashore's ocean beach impacted by this activity, beach cleaning operations result in long-term negligible adverse impacts on invertebrates. Compliance for this action is currently underway.

The Seashore staff proactively manages for birds within the Seashore, including colonial waterbirds in the Laguna Madre. Management activities for colonial waterbirds include possible predator control of coyotes and raccoons, habitat improvements, rookery monitoring, and conducting prescribed fires. The Seashore also has a 6-foot leash law for dogs on the Gulf beach as a measure to protect birds from harassment. These activities would provide long-term beneficial impacts on waterbirds, including those species that also use the Gulf beach for foraging and resting.

The combined effect of these other activities on wildlife using the Gulf beach would be short- and long-term minor adverse. In concert with the long-term negligible to minor adverse impacts of alternative 1, overall cumulative impacts on wildlife would be long-term minor adverse.

### **Conclusion**

Under alternative 1, repeated, short-term displacement of wildlife associated with vehicular travel would continue. In addition, mammals could be struck by vehicles driving on the beach. Beach driving could reduce invertebrate populations in localized areas, and repeated passes could disturb and disperse the

wrack line. Birds would continue to be displaced by flushing, and their foraging and resting opportunities would be diminished. Impacts on wildlife from beach vehicles under alternative 1 would be short- and long-term negligible to minor adverse due to the large amount of habitat the Gulf beach provides and the lower density of vehicle use south of mile marker 10. Cumulative impacts on wildlife would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

Under alternative 2, a seasonal reduction in speed limit from 25 mph to 15 mph along the length of the Gulf beach would be implemented during the majority of the Kemp’s ridley sea turtle nesting season. Outside of this time, the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph, with a 100-yard safety zone around named hazards, including wildlife and flocks of birds, where vehicles must slow to 15 mph.

### **Mammals**

A change in speed limit would not be expected to result in measurable changes in foraging on and use of the beach by mammals. As noted in the analysis for alternative 1, mammals that dwell near the beach would be displaced temporarily upon vehicle approaches, but could readily return to their pre-disturbance behavior. Occasional strikes resulting in injury and mortality would be expected to continue, but the lower speed during the seasonal restriction and when approaching within 100 yards of wildlife would allow for more time to change course or stop to avoid the more readily visible mammals on the beach. Results from the Seashore’s beaching driving analysis showed that braking distance and stopping distance decreased substantially as velocity decreased. A more detailed discussion can be found in the “Visitor and Employee Safety” section. A reduction in speed from 25 mph to 15 mph resulted in a reduced average braking distance from 52.5 feet to 21.0 feet, and a stopping distance from 107.5 feet to 54.0 feet. A slower speed would give vehicle operators the ability to see and react to mammals on the beach more quickly to avoid collisions, would provide shorter vehicle stopping distances, and would give the animals more time to move out of the way. However, given that few vehicle-mammal accidents are currently reported, any benefits realized from a 10-mph reduction in speed limit and a 100-yard safety zone would be negligible. Impacts such as disturbance and displacement related to the presence of vehicles would not be expected to be substantially different for vehicles traveling at 15 mph versus 25 mph. While reducing the speed limit through beach-wide seasonal restrictions and safety zones would provide some long-term benefits, the overall impacts on mammals under alternative 2 would be similar to alternative 1 and would be short- and long-term negligible to minor adverse.

### **Invertebrates**

Crushing of individual invertebrates, reduced burrow numbers, and displacement and dispersal of the wrack line are not associated with vehicle speed, but with vehicular travel in general. Because the impacts on invertebrates would occur similarly at any speed, and it is not possible to readily see and avoid these animals on the beach, the adverse impacts on invertebrates under alternative 2 would be similar to those discussed for alternative 1 – long-term minor adverse.

### **Birds**

As discussed under alternative 1, flushing impacts on birds from vehicles is more a function of their presence and their distance of approach rather than their speed. The NPS is not aware of any published studies that compare bird flushing initiation distance when vehicles are traveling at slower speeds such as those proposed under alternative 2. However, if a vehicle were to approach close enough to cause

shorebirds to flush, a higher approach speed may cause birds to flush slightly sooner and to remain off the feeding or resting areas for slightly longer periods of time because the vehicle's approach may be perceived by the birds as more alarming visually and possibly audibly. However, it is not expected that the bird's response would be substantially different for 15 mph than 25 mph. In addition, the risk of vehicles colliding with birds would likely be similar between the two speed limits, because collisions are rare events at any speed due to the bird's flushing behavior. Thus, reducing the speed limit to 15 mph during a portion of the year and implementing safety zones might not provide meaningful beneficial impacts on birds. Although some birds may not be able to avoid vehicles traveling at higher speeds as well as they could avoid a slower vehicle, there are no studies to support this. Thus, overall impacts on birds under alternative 2 would be short- and long-term negligible to minor adverse.

### **Cumulative Impacts**

The combined effect of other projects and planned activities on wildlife using the Gulf beach would be as described for alternative 1 – short- and long-term localized minor adverse. In concert with the slight long-term benefits for mammals and birds and the long-term minor adverse impacts on invertebrates, overall cumulative impacts of alternative 2 on wildlife would be long-term minor adverse.

### **Conclusion**

Under alternative 2, repeated, short-term displacement of wildlife associated with vehicular travel would continue as would some small number of collisions between vehicles and wildlife. Mammals and birds would continue to be displaced, and their foraging and resting opportunities would be diminished. Reduced vehicle speeds may reduce the severity of disturbance or injury, and the potential for collisions, but probably only negligibly. Beach driving could reduce invertebrate populations, and disturb and disperse the wrack line, a long-term minor adverse impact. Cumulative impacts on wildlife would be long-term minor adverse.

### **IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Alternative 3 would implement a 15 mph speed limit from March 1 through Labor Day for the entire beach. Outside of these dates (i.e., from the day after Labor Day through February 28), the speed limit from mile marker 2.5 south to Mansfield Channel would be 25 mph. Existing impacts on wildlife within the analysis area would be the same as alternative 2, with additional protection of people and resources from reduced speed limits during the busy visitor use period (March through September), Kemp's ridley nesting season (even if nesting expands beyond the months of April and July), nesting and hatching seasons for other sea turtle species, and some of the spring and fall bird migrations.

### **Mammals**

As described for alternative 2, a change in speed limit would not be expected to result in measurable changes in foraging on and use of the beach by mammals. Mammals that dwell near the beach would be displaced temporarily upon vehicle approaches, but could readily return to their pre-disturbance behavior. Occasional strikes resulting in injury and mortality would likely continue as described under alternative 2 as well. Reducing the speed limit for a longer period under alternative 3 would provide some benefits to mammals, compared to alternative 2, although these benefits would only be slight due the minimal amount of impact that currently exists. Therefore, overall impacts under alternative 3 would be short- and long-term negligible to minor adverse.

## **Invertebrates**

The adverse impacts on invertebrates discussed for alternative 1 would continue under alternative 3. Crushing of individual invertebrates, reduced burrow numbers, and displacement and dispersal of the wrack line are not associated with vehicle speed, but with vehicular travel in general. Thus, impacts would be as described for alternative 1 – long-term localized minor adverse.

## **Birds**

Under alternative 3, the extension of the 15 mph speed limit would cover some of the spring and fall bird migration periods and would include approximately three months in addition to alternative 2. However, as described above under alternative 2, a reduction in speed from 25 mph to 15 mph is not expected to result in appreciable benefits, since the flushing of species due to vehicles is more a function of the presence of vehicles and pedestrians and specifically how close they approach birds rather than the speed at which they approach. Therefore, any benefits to shorebirds realized under alternative 3 compared to alternative 2 would be slight. Overall, impacts on birds under alternative 3 would be short- and long-term negligible to minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and plans activities on wildlife using the Gulf beach would be as described for alternative 1 – short- and long-term localized minor adverse. In concert with the slight long-term benefits for mammals and shorebirds, and the long-term minor adverse impacts on invertebrates, overall cumulative impacts of alternative 3 on wildlife would be long-term minor adverse.

## **Conclusion**

Under alternative 3, repeated short-term displacement of wildlife associated with vehicle traffic would continue. Mammals and birds would continue to be displaced, and their foraging and resting opportunities would be diminished; vehicle speeds may reduce the severity of such disturbance or of injury, but any benefit would be slight. Beach driving could reduce invertebrate populations, and disturb and disperse the wrack line, a long-term minor adverse impact. Cumulative impacts on wildlife would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Under alternative 4, the speed limit for those areas open to vehicles on the Seashore's ocean beach would be 15 mph year-round; similar to the speed limit in place for all Texas beaches.

## **Mammals**

A change in speed limit would not be expected to result in measurable changes in foraging on and use of the beach by mammals. As noted in the analysis for alternative 1, mammals that dwell near the beach would be displaced temporarily upon vehicle approaches but could readily return to their pre-disturbance behavior. Occasional strikes resulting in injury and mortality would be expected to continue. However, a slower speed year-round would reduce vehicle stopping distance and would give vehicle operators the ability to see and react to mammals seen on the beach more quickly to avoid adverse impacts, as well as allowing more time for animals to disperse from the oncoming disturbance and avoid a collision. However, given that there are currently relatively few documented vehicle-mammal collisions, any beneficial impacts realized under alternative 4 would be slight. As noted previously, because impacts such as disturbance and displacement are related to the presence of vehicles and not necessarily related to the

speed of a vehicle, any benefits realized from a reduction in speed from 25 mph to 15 mph would be minimal, and overall impacts on mammals under alternative 4 would be similar to alternative 1 – short to long-term negligible to minor adverse.

### **Invertebrates**

The adverse impacts on invertebrates discussed for alternative 1 would continue under alternative 4. Crushing of individual invertebrates, reduced burrow numbers, and displacement and dispersal of the wrack line are not associated with vehicle speed, but with vehicular travel in general. Thus, impacts would be as described for alternative 1 – long-term minor adverse.

### **Birds**

Under alternative 4, the extension of the 15-mph speed limit would cover all of the spring and fall bird migration periods. However, as described above under alternatives 2 and 3, a reduction in speed from 25 mph to 15 mph is not expected to result in appreciable benefits since the flushing of species due to vehicles is more a function of the presence of a vehicle and how close it approaches a bird or flock of birds than the speed at which it approaches the bird/flock, and it is not expected that the slight risk of collision would be substantially different for the two vehicle speeds. While, alternative 4 would be slightly more beneficial than the other action alternatives due to the year-round speed limit reduction, the overall impacts would still be short- and long-term negligible to minor adverse.

### **Cumulative Impacts**

The combined effect of other projects and plans activities on wildlife using the Gulf beach would be as described for alternative 1 – short- and long-term localized minor adverse. In concert with the slight long-term benefits for mammals and birds, and the long-term minor adverse impacts on invertebrates, overall cumulative impacts of alternative 4 on wildlife would be long-term minor adverse.

### **Conclusion**

Under alternative 4, repeated short-term displacement of wildlife associated with vehicular travel would continue. Mammals and shorebirds would continue to be displaced, and their foraging and resting opportunities would be diminished, though decreased vehicle speeds may reduce the severity of such disturbance and incidence and severity of collisions, resulting in some slight increased benefit compared to other action alternatives. Beach driving could reduce invertebrate populations and disturb and disperse the wrack line, a long-term minor adverse impact. Cumulative impacts on wildlife would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTION A**

Speed limits under this alternative would be similar to those under alternative 1, with the speed limit for North Beach and from mile marker 0 to 2.5 on South Beach being 15 mph year-round, and the speed limit from mile marker 2.5 to Mansfield Channel being 25 mph. However, under this alternative, year-round safety zones would be implemented for those areas within 100 feet of people, pets, parked vehicles and structures, but this option does not include wildlife buffers. Within the safety zone, vehicles would be required to slow to 15 mph.

## **Mammals**

Because the safety zone for this option does not include wildlife, there would be no difference between this alternative and alternative 1. As described for alternative 1, individual mammals may on occasion be injured or killed, but these impacts would have no community or population level effects. Beach driving would continue to result in short-term movement of mammals using the shoreline for foraging or resting. Mammals that dwell near the beach would be displaced temporarily upon vehicle approaches but could still readily return to their pre-disturbance behavior. The combination of injury and mortality would result in localized short- and long-term negligible to minor adverse impacts on mammals.

## **Invertebrates**

The adverse impacts on invertebrates discussed for alternative 1 would occur similarly under alternative 5, option A. Crushing of individual invertebrates, reduced burrow numbers, and displacement and dispersal of the wrack line are not associated with vehicle speed, but with vehicular travel in general. Thus, impacts would be as described for alternative 1 – long-term localized minor adverse.

## **Birds**

Because no safety buffer would be established for wildlife under option A, impacts of this alternative would be the same as alternative 1 – localized short- and long-term minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and plans activities on wildlife using the Gulf beach would be as described for alternative 1 – short- and long-term localized minor adverse. In concert with the short- and long-term negligible minor adverse impacts on wildlife of this alternative, overall cumulative impacts of alternative 4 on wildlife would be long-term minor adverse.

## **Conclusion**

Under alternative 5, option A, repeated short-term wildlife displacement of wildlife associated with vehicular travel would continue. In addition, mammals could be struck by vehicles driving on the beach. Beach driving could reduce invertebrate populations, and disturb and disperse the wrack line. Birds would continue to be displaced and their foraging and resting opportunities would be diminished. Impacts on wildlife from beach vehicles under alternative 5, option A, would be long-term negligible to minor adverse. Cumulative impacts on wildlife would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE MODIFIED, OPTION B**

This alternative is similar to alternative 5, option A. However, under this alternative, the 100-foot safety zones would also be established around wildlife.

## **Mammals**

Implementation of 100-foot safety buffers would not be expected to result in measurable changes in foraging on and use of the beach by mammals. As noted in the analysis for alternative 1, mammals that dwell near the beach would be displaced temporarily upon vehicle approaches, but could readily return to their pre-disturbance behavior. Occasional strikes resulting in injury and mortality would be expected to

continue. Due to the time it takes to react to a situation to either avoid a collision or to brake and stop the vehicle, a 100-foot safety zone may be insufficiently small to reduce collisions. However, given the relatively few vehicle-mammal collisions that likely occur currently, any benefits realized under this alternative would be slight. Therefore, overall impacts under this alternative would be short- to long-term negligible to minor adverse.

## **Invertebrates**

The adverse impacts on invertebrates discussed for alternative 1 would continue under alternative 5, option B, since crushing of individual invertebrates, reduced burrow numbers, and displacement and dispersal of the wrack line are not associated with vehicle speed, but with vehicular travel in general. Thus, impacts would be as described for alternative 1 – long-term minor adverse.

## **Birds**

Flushing impacts on birds from vehicles are more a function of their presence and their distance of approach rather than their speed. However, as discussed under alternative 2, if a vehicle was to approach close enough to cause birds to flush, a higher approach speed may cause birds to flush slightly sooner and to remain off the feeding or resting areas for slightly longer periods of time because the vehicle's approach may be perceived by the birds as more alarming visually and possibly audibly, though it is not expected that the response would be substantially different for 15 mph than 25 mph. Due to the time it takes to react and/or stop a vehicle, a 100-foot safety zone may be too small to reduce collisions. Thus, any benefits realized from implementing safety zones around birds under this alternative would be slight at best. Furthermore, it is not expected that a reduction in speed from 25 mph to 15 mph in the safety zone would substantially decrease the risk of vehicle-shorebird collisions since collisions are rare at any speed due to the birds' flushing behavior. Therefore, overall impacts from maintaining a speed limit of 25 mph year-round while implementing safety zones around wildlife would be short-and long-term negligible to minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and plans activities on wildlife using the Gulf beach would be as described for alternative 1 – short- and long-term minor adverse. In concert with the slight long-term benefits for mammals and birds, and the long-term minor adverse impacts on invertebrates, overall cumulative impacts of alternative 5, option B, on wildlife would be long-term minor adverse.

## **Conclusion**

Under alternative 5, option B, repeated, short-term displacement of wildlife associated with vehicular travel would continue. Mammals and birds would continue to be displaced, and their foraging and resting opportunities would be diminished, and while decreased vehicles speeds may reduce the severity of such disturbance it would likely be of minimal benefit. Beach driving could reduce invertebrate populations, and disturb and disperse the wrack line, a long-term minor adverse impact. Impacts on wildlife from beach vehicles under alternative 5, option B, would be long-term negligible to minor adverse. Cumulative impacts on wildlife would be long-term minor adverse.

## **SPECIAL-STATUS SPECIES**

Padre Island National Seashore has no designated critical habitat within the Seashore's boundary for any federally or state listed species. An existing USFWS Recovery Action Plan for the Kemp's Ridley sea turtle assigns the task of patrolling for nesting sea turtles to the Seashore. This recovery plan and recovery

plans for the four other sea turtle species that occur in the Gulf of Mexico also assign other tasks to the NPS. Some of the tasks assigned include participating in the Sea Turtle Stranding and Salvage Network and conducting public education, monitoring, and research activities. Those federally and state-listed species that occur on the beach that could be impacted by the proposed action are listed below in table 9 and are grouped by assemblages based upon species similarities, available habitat, and possible impacts from changes in speed limits for vehicles included in the alternatives for driving on the beach.

**TABLE 9. FEDERALLY AND STATE LISTED SPECIES OCCURRING ON THE OCEAN BEACH THAT WOULD LIKELY BE IMPACTED BY THE PROPOSED ACTION**

Species Assemblage	Individual Species
Sea Turtles	Kemp's ridley ( <i>Lepidochelys kempii</i> ) Loggerhead ( <i>Caretta caretta</i> ) Green sea turtle ( <i>Chelonia mydas</i> ) Hawksbill sea turtle ( <i>Eretmochelys imbricata</i> ) Leatherback sea turtle ( <i>Dermochelys coriacea</i> )
Birds	Easter brown pelican ( <i>Pelecanus occidentalis</i> ) Piping plover ( <i>Charadrius melodious</i> ) Reddish egret ( <i>Egretta rufescens</i> ) White-faced ibis ( <i>Plegadis chihi</i> ) Sooty tern ( <i>Sterna fuscata</i> ) Black tern ( <i>Chlidonias niger</i> )

## METHODS AND ASSUMPTIONS

Potential impacts on special-status species populations and habitat were evaluated based on available Seashore research, other Seashore plans, scientific literature, life history, and available scientific studies on the impacts of human disturbance on wildlife, and consultation with other permitting agencies.

The following definitions were used to assess the intensity and duration of adverse impacts on special-status species:

- Negligible:* Impacts would result in a change to a population or individuals of a special-status species, but the change would be well within the range of natural fluctuations.
- Minor:* An action would affect a few individuals of a special-status species or have very localized impacts upon their habitat. The change would have barely perceptible consequences to the species or habitat function. Sufficient habitat would remain functional in the Seashore to maintain species viability. Mitigation measures, if needed to offset adverse effects, would be simple and successful.



*Moderate:* An action that would cause measurable effects on (1) a relatively small percentage of the species population, (2) the existing dynamics between multiple species (e.g., predator-prey, herbivore-forage, vegetation structure-wildlife breeding habitat), or (3) a relatively large habitat area or important habitat attributes. A population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable within the Seashore. Response to disturbance by some individuals could be expected, with some negative impacts on feeding, reproduction, or other factors impacting short-term population levels. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

*Major:* An action that would have drastic and permanent consequences for a species population, dynamics between multiple species, or almost all available unique habitats. A population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the Seashore. Frequent responses to disturbance by some individuals would be expected, with negative impacts on feeding, reproduction, or other factors resulting in a decrease in population levels. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

*Duration:* Short-term: Those impacts occurring over the course of year.

Long-term: Those impacts occurring over more than one year.

## **IMPACTS OF ALTERNATIVE 1: NO ACTION**

Under alternative 1, there would be no change to the speed limit and conditions would remain the same as they were prior to the temporary seasonal restrictions implemented during the 2009 and 2010 turtle nesting season. The speed limit for North Beach and from mile marker 0 to 2.5 on South Beach would continue to be 15 mph year-round, while the year-round speed limit from mile marker 2.5 to Mansfield Channel would continue to be 25 mph.

### **Sea Turtles**

Sea turtles nest and strand along the Seashore's entire ocean beach. Vehicles driving on the beach can impact sea turtles directly and indirectly. Beach driving may alter the beach profile and substrate characteristics in ways that reduce suitability for nesting and hatching success. Beach driving may contribute to erosion on the beach leading to steeper fore-dunes, which may be unsuitable for nesting (Cohen et al. 2010). Vehicle driving also compacts the sand, potentially making it more difficult for females to dig their nest cavities. Driving on beaches can also disturb nesting females as they come ashore, interrupting their nesting behavior and causing them to abandon their nesting attempts (often called a false crawl or a non-nesting emergence). False crawls can be caused by anthropogenic (i.e., manmade) disturbances or by natural causes such as suboptimal sand conditions; encounters with roots, debris (including manmade debris), or rocks while digging a nest; or other unknown reasons. Whether resulting from natural or anthropogenic causes, false crawls increase the number of times that a turtle is subjected to human-related and natural threats on the beach and may cause a turtle to nest in another location that is less optimal. There is also the potential that turtles deterred from nesting may shed their eggs at sea (Witherington and Martin 1996).

Other impacts from vehicles include running over and obscuring tracks left in the sand by nesting turtles, and running over nests. Seashore staff and volunteers locate potential nests by following the crawl tracks left in the sand by the nesting sea turtles. However, if the nesting turtle is not seen laying eggs and the nest is not marked then, the nest can be difficult to find because Kemp's ridley tracks are faint and disappear quickly. If these tracks are obscured by vehicle traffic running over them, it is even more difficult or impossible to locate, document, and protect the nests. These nests are then subject to other potential impacts such as predation, inundation from tides or storm surge which can reduce hatching success, or being driven over by subsequent vehicles. Driving over incubating sea turtle nests can kill pre-emergent hatchlings or cause sand compaction, which may decrease nest success (NMFS, USFWS, and SEMARNAT 2010).

Beach driving can also create ruts and ridges in the sand that pose obstacles to nesting turtles and emerging hatchlings attempting to reach the ocean, resulting in extended periods of travel or entrapment. Hatchlings that become trapped in vehicle ruts are more vulnerable to injury or death from predation, dehydration, or crushing by subsequent vehicles (Hosier et al. 1981).

Additionally, headlights from vehicles driving at night can also impact sea turtles, either by deterring females from nesting or by disorienting hatchlings as they try to make their way to the ocean (NMFS, USFWS, and SEMARNAT 2010; NMFS and USFWS 2008). While Kemp's ridley sea turtles nest primarily during daylight hours, some nest at night. These night nesters, along with the other four species of sea turtles documented nesting at the Seashore (green, loggerhead, hawksbill and leatherback sea turtles), which are nighttime nesters, could be impacted by vehicle lights on the beach at night. Depending on the location of the headlights with respect to a hatching nest, hatchlings may move toward the artificial light in a direction that is away from or parallel to the ocean. This can result in the hatchlings never finding their way to the ocean. It can also cause the hatchlings to expend more energy than necessary to find the ocean, leading to exhaustion and an increased risk of predation or desiccation. Hatchlings of most sea turtle species emerge at night and could be affected by headlight disorientation. Operating vehicles on the beach can also result in a vehicle hitting a nesting sea turtle, either injuring or killing it, or running over and killing hatchlings.

Vehicles can also run over stranded sea turtles. Sea turtle strandings occur when a turtle washes onto the beach dead, injured, ill, or weak. Sea turtle strandings are common at the Seashore. Post-hatchlings and juveniles are often found within seaweed which periodically washes ashore. Since 1997, at least eight stranded sea turtles have been run over by vehicles in the Seashore, with three of those known to be alive at the time of the accident. Two others were freshly dead and could have been alive at the time of the incident (Shaver 2010c). Most of the eight were green turtles; the green turtle is found stranded alive on the Seashore's Gulf beach more frequently than is any other sea turtle species, and the juvenile green turtle population is increasing rapidly (Shaver et al. in press). Eight is likely a conservative number as many stranded sea turtles are decomposed when found and it is very difficult to determine the sources of injury. Additionally, according to Sea Turtle Stranding and Salvage Network procedures, the person documenting a stranded turtle is not supposed to guess at the cause of an injury if they are unsure (Shaver 2010c).

While beach driving may cause direct and/or indirect adverse impacts on sea turtles, no known studies have been conducted regarding vehicle speed and impacts on nesting sea turtles, stranded sea turtles, or emerging hatchlings.

In an attempt to help protect and recover the Kemp's ridley sea turtle population, and to protect other federally listed nesting sea turtles, the Seashore conducts sea turtle monitoring and protection efforts. Intensive daily, day-time patrols are conducted along the entire ocean beach during April through mid-July. For example, from April 5 to July 18, 2009, Seashore staff and volunteers patrolled 99,828 miles of

beach involving 12,002 hours. Less intensive patrols are conducted from mid-July through September. Seashore staff and volunteers attempt to find and protect nesting Kemp's ridley turtles. All nesters located are documented and guarded until they safely re-enter the water. Once staff and volunteers detect sea turtle nests, they remove all of the eggs to either the Seashore's incubation facility or a protected beach corral to protect them from a variety of human related and natural threats, including beach driving. No sea turtle nests are intentionally left on the beach to incubate and hatch unprotected in-situ. However, nearly each year, a few sea turtle nests are not detected at egg laying and are found later, either predated or hatched. These are at locations where tracks from the nesting turtles were found, but the nest could not initially be located, or at sites that were completely unknown to biologists. Since 2002, ten (10) nests within the Seashore were known to have been missed at the time of egg laying and were discovered days or weeks later, when they were predated or hatched (Shaver 2004, 2005, 2006a, 2006b, 2007, 2008, 2009, 2010a). All of these nests were located high on the beach or in the dunes, but this does not reflect the overall distribution of nests at the Seashore, which extends from the high tide line into the dunes. Though none have been documented, some undetected nests have likely occurred lower on the beach, but they likely went unrecorded because they failed due to factors more prevalent lower on the beach such as high tides or being run over by vehicles.

Because most nests within the Seashore are likely found and relocated to the incubation facility or the corral, the primary potential for impacts on sea turtles from vehicle traffic on the beach is through collisions with nesting females or stranded turtles, causing injury or death.

During the 25 years that systematic monitoring for turtle nests has occurred at the Seashore (1986 to present), there has not been a documented incident of a vehicle hitting a nesting sea turtle or emerging hatchlings at the Seashore (Shaver 2010b). There has also not been a documented incident of a vehicle crushing a turtle nest by driving over it. While current nesting data do not indicate that compaction by vehicles driving over a nest is causing a negative impact, it cannot be ruled out that some minimal level of impact is occurring, because it is possible that nests have gone undetected and did not survive to hatching because of vehicular beach driving, predation, tidal inundation, some other factor, or a combination of the above.

Along the entire Texas coast, 29 hatchlings from 6 different nests have been run over by vehicles since 2002. Prior to 2002 there were no recorded incidents of this type. There have also been three documented incidents where a vehicle driving on a Texas beach struck a nesting Kemp's ridley turtle. In 2002, a nesting Kemp's ridley turtle was struck by a passing vehicle on Matagorda Peninsula, though it is not known if the turtle was killed. Visitors placed the bleeding turtle into the surf and she swam away. While a dead adult Kemp's ridley was found several days later in the vicinity, it could not be shown whether or not it was the turtle that had been struck by the vehicle (NMFS, USFWS, and SEMARNAT 2010; Shaver 2010b). In 2008, two Kemp's ridley turtles that emerged to nest on South Padre Island were struck by passing vehicles and died as a result of their injuries. At one of those sites, the person that struck the turtle was apprehended. He was questioned and admitted that he was "driving fast in soft sand" and by the time that he saw the turtle "it was too late to stop." It was estimated that he was driving 25 to 30 mph (Shaver 2010b). The speed limit on Texas state beaches is 15 mph and this is the only incident where speed is known to be a contributing factor to a vehicle accident with a turtle or hatchling. In 1996, a nesting loggerhead was struck and killed by a vehicle that drove over it on the Bolivar Peninsula (Shaver 1997).

Kemp's ridley sea turtles are by far the most prolific nesters at the Seashore with a record of 117 nests documented in 2009. Only one hawksbill nest has ever been recorded at the Seashore. Only one leatherback has been recorded recently, although historic nesting was documented. Fourteen (14) green sea turtle nests (ranging from 1 to 5 nests annually) and 15 loggerhead sea turtle nests (ranging from 0 to 9 annually) have been recorded at the Seashore since 2006. However, patrols are limited after mid-July, and thus some nests from these later nesting species could be missed. Thus, the potential for vehicles

traveling on the beach interacting adults, hatchlings, or nests is greater for Kemp's ridley than for the other four species. While there are no documented occurrences in the Seashore of vehicles adversely impacting nesting adults, hatchlings or nests, occurrences of nesting turtles and hatchlings emerging from undetected nests at other locations in Texas with 15 mph speed limits indicates there is a possibility that, under the current speed limits at the Seashore, impacts on sea turtles, particularly the Kemp's ridley, could occur. Additionally, vehicles can and have impacted stranded sea turtles at the Seashore. However, vehicle impacts on stranded sea turtles cause minimal impacts on the species population as a whole because stranded sea turtles are generally either already dead, ill, or in a weakened condition.

Due to conservation measures currently in place and increasing population numbers, population models for the Kemp's ridley predict that the population as a whole will grow 12 to 16 percent per year, for the near future, assuming current survival rates within each life stage remain constant (NMFS, USFWS, and SEMARNAT 2010). As the population of Kemp's ridley increases, presumably the number of turtles nesting at the Seashore would also increase, creating a greater potential for vehicle-turtle impacts. Kemp's ridley turtles often nest in synchronous emergences called *arribadas*. At the Seashore, the total number of sea turtles nesting in a single day has not exceeded 17 (Shaver 2010d), and since 2006, there has been an average of 11 days annually with three or more sea turtle nests documented (Shaver 2010g). If the Kemp's ridley nesting population continues to grow as predicted, there may be future instances when the number of nesters at one time exceeds the ability of Seashore staff and volunteers to immediately find and protect the turtles and nests. Currently, visitor vehicles may be temporarily detained by Seashore staff to enable a nesting turtle to cross the beach to or from her nest site, and to enable her to nest without disturbance. Park staff then relocates the eggs to the incubation facility or a protected beach corral. This greatly reduces the potential for vehicles to impact nesting females, nests, and hatchlings. If a large *arribada* were to occur in the future, Seashore staff would temporarily slow or stop vehicles (for a matter of hours, as individual females are only on the beach for a total of approximately 30 to 45 minutes while nesting) from traveling up and down the beach in the vicinity of the nesting turtles. Once a corridor for vehicles could be cleared, vehicles would then be allowed to continue to pass the area. This would greatly reduce the potential for vehicles to impact nesting sea turtles.

Based on current data and procedures for protecting sea turtle nests, vehicles driving on the beach under the designated Seashore speed limits of 25 mph south of mile marker 2.5 and 15 mph elsewhere outside of areas closed to vehicle traffic would have long-term minor adverse impacts on sea turtles. However, if the Kemp's ridley nesting population continues to increase and grow at the recovery plan's predicted rate, the impacts from vehicles driving at the current speed limits on the beach could potentially become long-term moderate adverse as the potential for vehicle collisions with nesting sea turtles and driving over tracks and nests would increase.

### **Cumulative Impacts**

Other past, present, and future planned actions within the Seashore have the potential to have both beneficial and adverse impacts on the sea turtles nesting within the Seashore. For more than three decades, the NPS at Padre Island National Seashore has participated in the international effort to recover the Kemp's ridley sea turtle. Through the head-start program, Kemp's ridley turtle eggs were brought from Mexico to the Seashore to re-establish a nesting colony there. In addition, Seashore staff and volunteers monitor the beach for nesting turtles and relocate any nests found to either the incubation facility or to a protected beach corral in the park. From 1979 to 2008, the annual hatching success for eggs from Texas nests held in the Seashore's incubation facility averaged 81 percent, while hatching success from 2000 to 2008 held in corrals averaged 79 percent with virtually 100 percent of the hatchlings surviving to reach the ocean because they were manually released and monitored (NMFS, USFWS, and SEMARNAT 2010). These numbers are greater than those for in-situ nests in Texas where the annual hatching success for 26 in-situ nests was estimated at a maximum of 62 percent, though true success rates

could not be determined as predation of many eggs and hatchlings occurred and emergence was not observed by biologists (NMFS, USFWS, and SEMARNAT 2010). The sea turtle recovery program at the Seashore has been a success, because approximately 55 percent of the Kemp's ridley nests found in the United States occur at the Seashore and the number of nests recorded at the Seashore has increased from one in 1994 to 74 in 2010 with a peak of 117 in 2009. Leaving turtle nests to incubate in-situ would subject them to decreased hatching success from predation, inundation and erosion from high tides and hurricanes, as well as anthropogenic impacts such as sand compaction, vehicle ruts, collisions, and driving over nests. The Kemp's ridley is recovering from near extinction in the mid-1980s, monitoring and protecting turtles and their nests in the past and continuing to protect them in the future by means of the sea turtle recovery program would provide substantial long-term beneficial impacts on this sea turtle species.

Historically, incubation facilities at the Seashore were screen-enclosed structures attached to buildings, with the first operated from 1978 to 1982 and the second from 1983 to 2005. In 2005, a new turtle incubation facility that provided office space and a temperature controlled incubation room with the capacity to accommodate 250 nests (Shaver 2010g) was constructed. This facility increased the ability of the Seashore to relocate, protect, and ensure the hatching success of nests, resulting in long-term beneficial impacts on sea turtles. Currently there are plans to expand this facility and to construct two new cabins down island to provide sleeping accommodations for turtle monitors, and construct new corrals on the beach. Through increased ability to detect and protect nesting Kemp's ridley turtles and sea turtle nests, this project would provide long-term beneficial impacts on sea turtles.

Existing and future oil and gas operations in the Seashore often require vehicles to drive down the Gulf beach to access the sites. Potential impacts from the large vehicles include, but are not limited to, compacting sand, running over sea turtles, and causing false crawls. The Seashore has a programmatic Oil and Gas Management Plan and EIS (NPS 2001b) that provides management strategies and mitigation measures to minimize the potential impacts of oil and gas operations on sea turtles. Some of those measures include driving at a speed of 15 mph and having a qualified sea turtle monitor escort the vehicles on the beach. Additionally, each new project is subject to NEPA and undergoes an EA and consultation with the USFWS and NMFS which imposes further requirements if necessary. All of these measures minimize the potential impacts of oil and gas operations resulting in long-term minor adverse impacts.

Marine debris routinely washes ashore at the Seashore, especially during storms and hurricanes. Trash removal by Seashore staff can have both adverse and beneficial impacts on sea turtles. The debris itself, some of which is hazardous, can impede the movement of turtles on the beach as they try to find a nesting location and can cause a false crawl resulting in both short- and long-term minor adverse impacts, depending on the amount of debris and the timing of when debris is washed ashore. Removing the debris removes obstacles and hazards to nesting turtles, resulting in short- and long-term beneficial impacts. However, the vehicles on the beach that are necessary for the clean-up can have short- and long-term minor adverse impacts on sea turtles by compacting sand, causing ruts, and possibly colliding with stranded sea turtles, or with nesting sea turtles if clean-up occurs during nesting season.

Seashore staff also participate in systematic bird monitoring for a number of species including sensitive or special-status species that use the Gulf beach. These monitoring activities require vehicle use on the Gulf beach which can have short- and long-term minor adverse impacts on sea turtles by compacting sand, causing ruts, and possibly colliding with turtles if the monitoring occurs during the sea turtle nesting season.

The overall cumulative impact of these past, current, and future actions, added to the effects of actions under alternative 1, would result in long-term beneficial cumulative impacts, with a large number of benefits derived from the sea turtle recovery program.

## **Conclusion**

While there have been no recorded vehicle collisions with nesting sea turtles in the Seashore, vehicles have hit and killed stranded sea turtles. Additionally, outside of the Seashore where vehicle speed limits are 15 mph versus 25 mph in the Seashore south of mile marker 2.5, there have been three instances where vehicles struck nesting Kemp's ridley sea turtles, killing at least two of them, and one instance of a vehicle striking and killing a nesting loggerhead turtle. As a result, under current conditions, alternative 1 would have long-term minor adverse impacts on sea turtles. However, since 2006 the Kemp's ridley sea turtle population has substantially increased at the Seashore and population models for the species as whole predict that the population could grow at a rate of 12 to 16 percent (NMFS, USFWS, and SEMARNAT 2010). Also, the juvenile green sea turtle population is growing rapidly (Shaver et al. in press). If these increases continue, impacts from vehicles driving at the current speed limits on the beach would have a greater likelihood of impacts on sea turtles and their nests resulting in long-term minor to moderate adverse impacts. Cumulative impacts on sea turtles would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the sea turtle recovery program provides.

## **Birds**

As described in the Wildlife section analysis, impacts on birds from vehicles driving on the ocean beach include flushing birds and disrupting benthic invertebrates that are the food source for shorebirds. Flushing results in decreased foraging and resting time, increased flight time and the expenditure of valuable energy reserves, as well as potential collisions with vehicles while trying to evade them, though this is a rare occurrence.

As described in the Wildlife section, the flushing of bird species by the presence of vehicles or other disturbance is highly distance-dependent rather than being dependent upon the speed of encroachment. In other words, birds have a threshold "flushing initiation distance" that when exceeded causes birds to shift from resting and feeding behavior to running or flying away from the disturbance (Lafferty 2001a, 2001b), and this distance varies both between and within species. However, species also appear to become acclimated to repeated vehicular disturbances. Chaney et al. (1993) observed that for almost all species of birds at the Seashore, those on the northern 10 miles of the beach, where vehicle traffic was more prominent, tended to remain on the beach when a vehicle approached while those in areas where vehicle traffic was less tended to flush more easily.

In addition to flushing, vehicles driving on the beach can crush invertebrates (that shorebirds feed upon) and disturb the wrack line where many invertebrates reside by crushing, scattering or burying it. Studies have shown that vehicles driving on the beach and through the wrack line adversely impact the number of invertebrates on the beach (Kluft and Ginsberg 2009; Leatherman and Godfrey 1979). However, with over 50 percent of the visitors to the ocean beach not driving past mile marker 10 (Scott and Lai 2004), the majority of impacts on invertebrates that shorebirds would feed upon would be confined to the northern portion of the Seashore, and overall impacts would be minor because of the overall size of the entire beach and the lower density of vehicles south of mile marker 10.

Overall, vehicles driving on the beach would cause short- and long-term minor adverse impacts on federal and state-listed birds because of the infrequency of flushing due to low densities of vehicles across the entire beach and the minor impacts vehicles cause on invertebrates, a main foraging source for some of the shorebirds.

## Cumulative Impacts

Cumulative impacts on birds along the beach could result from visitor activities, Kemp's ridley sea turtle recovery efforts, oil and gas activities, marine debris removal, bird monitoring, other resources management activities, potential construction of the new sea turtle patroller cabins, border related issues, and general Seashore operations and development. The primary impact from these projects and operations would be disturbance from vehicles driving on the beach:

- Turtle patrollers drive at 15 mph along the entire ocean beach in search of nesting sea turtles, stranded sea turtles, sea turtle nests, and to release hatchlings
- Personnel respond to wildfires and conduct prescribed fires
- Oil and gas vehicles drive along the beach to access some of the drilling sites
- Vehicles on the beach are needed to conduct bird monitoring activities, count, document and rescue other wildlife, and monitor other resources; and to clean up debris (including hazardous waste) that has washed ashore on the beach from high tides and storms
- The new turtle patrol cabins would require vehicles to be on the beach temporarily during construction.

The main cause of disturbance to or flushing of birds from vehicles is their presence and how close they approach the individual or flock. Impacts from these vehicles would be long-term minor adverse as birds routinely return to their pre-disturbance activity shortly after vehicles pass, and in areas of high vehicle use, such as from mile marker 0 to mile marker 10, often become habituated to the presence of vehicles. Vehicles from the above named projects and activities could also cause adverse impacts on invertebrates, a main food source for shorebirds. Vehicles can crush invertebrates that are on the surface or buried slightly in the sand or disturb the wrack line where many invertebrates live, either crushing them directly, or dispersing the wrack so that it dries out and becomes less suitable habitat for invertebrates. Given the amount of beach available and the relatively few vehicles associated with these activities, the impact on invertebrates, and subsequently on shorebirds, would be short- and long-term minor adverse. Beach cleaning operations also occur to remove *Sargassum* along an approximately 500-yard stretch of Malaquite Beach closed to vehicles; an EA is currently underway to address this activity, which removes important habitat for invertebrates. However, given the relatively small area of the Seashore's ocean beach impacted by this activity, it only results in long-term negligible adverse impacts on invertebrates.

Seashore staff proactively manage for birds within the Seashore, including colonial waterbirds in the Laguna Madre. Management activities for colonial waterbirds include possible predator control of coyotes and raccoons, habitat improvements, rookery monitoring, and conducting prescribed fires. The Seashore also has a 6-foot leash law for dogs on the Gulf beach as a measure to protect birds from harassment. These activities would provide long-term beneficial impacts on waterbirds, including those species that also use the Gulf beach for foraging and resting.

The overall cumulative impact of these past, current, and future actions, added to the effects of actions under alternative 1, would result in long-term minor adverse cumulative impacts on federally and state-listed birds.

## Conclusion

Vehicles driving on the beach can impact birds by causing them to flush and by impacting invertebrates that are the primary food source for shorebirds. The speed of a vehicle, however, does not necessarily contribute much to the impact. Flushing results in decreased foraging and resting time, increased flight

time and the expenditure of valuable energy reserves, as well as potential collision with vehicles while trying to evade them, though this is a rare occurrence. Invertebrates in the sand and in the wrack can also be adversely impacted by vehicles driving over them, reducing the forage available to shorebirds. However, with over 50 percent of the visitors to the ocean beach not driving past mile marker 10 and the overall width and size of the beach, impacts from vehicles under alternative 1 would be short- and long-term minor adverse. Cumulative impacts would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

Under alternative 2, seasonal 15-mph speed limit restrictions would be in place throughout the Seashore during most of the Kemp’s ridley sea turtle nesting season. Outside of this time the speed limit from mile marker 2.5 to Mansfield Channel would increase to 25 mph with a 100-yard safety zone around named hazards, including wildlife and flocks of birds, where vehicles must slow to 15 mph.

### **Sea Turtles**

Sea turtle nests are found at the Seashore by observing turtles during the nesting process or finding tracks left in the sand left by nesting turtles. Most sea turtle nests are found by sea turtle patrollers, who are required to patrol the beach at no more than 15 mph. However, a few nests are first discovered by visitors. Since 2006, visitors (including those in areas closed to vehicles as well as those in areas open to vehicles) have been first to find a sea turtle nest approximately 5 to 8 percent of the time (Shaver 2010b). This encompasses years when the speed limit was 25 mph (2006-2008) as well as when the speed limit was 15 mph (2009 and 2010). For example, in 2010, visitors were the first to find 6 of the 74 nests (8 percent). While visitors were first on the scene in these instances, this does not mean that the nests would not have been found subsequently by turtle patrollers. Based on the relatively few number of nests that are found and reported by all visitors (not just those in areas open to vehicles) and the fact that data from 2006 to 2010 does not indicate that a 15 mph versus 25 mph speed limit for the public reduces the likelihood that a nest would be found, reducing the speed limit from 25 mph to 15 mph would have no negative effect on the ability of patrollers to find sea turtle nests.

As noted in the analysis for alternative 1, there can be an impact on sea turtles from vehicles driving over and obliterating nester tracks before patrollers arrive, making nest detection and protection more difficult or impossible. Vehicles can also drive over nests prior to them being found. There have been instances when visitors were first on the scene of nesting, but failed to recognize the nesting turtles or nesting tracks, and drove over the tracks. Requiring visitors to travel at 15 mph versus 25 mph would help prevent visitors who are following turtle patrollers from passing turtle patrollers and running over nester tracks prior to turtle patrollers finding them, which would enhance the ability of patrollers to find and protect sea turtle nests.

The Seashore relocates all of the nests found on the beach to the incubation facility or a corral, to protect them from threats, including beach driving. As noted in the analysis for alternative 1, a primary impact on sea turtles from vehicles driving on the beach is related to the potential for vehicles to collide with sea turtles. As vehicles are driving on the beach, a driver’s ability to stop prior to striking a sea turtle (nesting, stranded, or hatchling emerging from an undetected nest) that may be in its path is related to two variables: reaction time and braking distance (see the analysis for Alternative 2 under Visitor and Employee Safety for a complete discussion of these variables). As previously described, in 2009, the Seashore conducted a braking distance study to determine the distance it would take for a vehicle driving on the beach to stop on both wet and dry sand. The study showed that braking distance decreased substantially (by more than one half) with decreased vehicle speed. A reduction in speed from 25 mph to 15 mph reduced the average breaking distance from 52.5 feet to 21.0 feet (NPS 2009c). Adding to this the



reaction time distance, the study found the overall average stopping distance for a vehicle traveling on the beach at 25 mph and 15 mph to be 107.5 feet and 54 feet, respectively.

Kemp's ridley is the smallest of the sea turtles that nest at the Seashore with adults reaching about 2 feet in length, 9 inches in height, and weighing 70 to 108 pounds and are often difficult to see, for in addition to their small size, their color blends in with vegetation and sand and they often become partially covered with sand during nesting. Traveling at a slower speed (15 mph versus 25 mph) would provide shorter vehicle stopping distances and a greater likelihood that vehicle operators could avoid directly impacting nesting or stranded sea turtles, or hatchlings emerging from an undetected nest, especially since they can be difficult to see from a distance. Requiring visitors to travel at 15 mph versus 25 mph would also prevent visitors following turtle patrollers from passing them and possibly directly impacting turtles on the beach.

Under alternative 2, the speed limit would be reduced from when the first Kemp's ridley turtle nest is observed in the Seashore that year or on April 15, whichever is earlier, until five days after the last Kemp's ridley nest that has ever been recorded at the Seashore. While the reduced speed limit would encompass nearly the entire Kemp's ridley nesting season, it would not necessarily include the very beginning of the season. Kemp's ridley tracks are often difficult to see and can easily be obscured by winds, rain, or high tides. Therefore, if the first nests of the season go undetected, the speed limit would not be reduced during this time. Additionally, the reduced speed limit would be enacted only as a result of a nest occurring at the Seashore. The first nests of the Kemp's ridley nesting season could occur outside of the Seashore's boundary, potentially increasing the likelihood that the first nesters in the Seashore could be impacted by higher speed limits until the first nest is actually observed within the Seashore. The reduction end date would also not include the last weeks of the Kemp's ridley hatchling emergence season for those nests that go undetected and unprotected on the beach. While the nesting season for the other four sea turtle species documented at the Seashore often extends into September, with hatching extending even later, few nests of these species are currently found annually at the Seashore (only one leatherback and one hawksbill have been recorded at the Seashore in recent years, and only 0-9 loggerhead and 1-5 green sea turtles have been recorded annually since 2006). Therefore, any potential adverse impacts on these species or beneficial impacts from implementing a 100-yard safety zone around wildlife outside the time when the speed limit is reduced to 15 mph would be negligible.

Based on current conditions, reducing the speed limit to 15 mph during nearly the entire Kemp's ridley sea turtle nesting season would result in long-term beneficial impacts on sea turtles. However, if the Kemp's ridley nesting population at the Seashore continues to increase as it has since 2006, and grows at the recovery plan's predicted rate of up to 16 percent annually, there would likely be days when the number of nesters and tracks outnumbers the ability of turtle patrollers to immediately protect the turtles and nests (e.g., slowing or stopping traffic temporarily to enable a nesting turtle to cross the beach to or from her nest site, and to enable her to nest without disturbance), leaving them exposed to potential impacts from vehicles traveling up and down the beach. Under these circumstances, driving at 15 mph under alternative 2 would help minimize potential vehicle-turtle interactions by reducing the overall stopping distance of a vehicle approaching a turtle, resulting in even greater long-term beneficial impacts.

### **Cumulative Impacts**

Effects to sea turtles from cumulative actions would be the same as described under alternative 1, which include long-term negligible to minor adverse as well as beneficial impacts. When combined with the long-term beneficial impacts from alternative 2, cumulative impacts would be long-term beneficial, and would be more beneficial than those described for alternative 1 based on the additional protection provided by the seasonally reduced speed limit.

## **Conclusion**

Vehicles are able to stop on average in approximately one-half the distance when traveling at 15 mph versus 25 mph (55 feet versus 107.5 feet). Because Kemp's ridley sea turtles, the primary nesters at the Seashore, are small, blend in with sand and vegetation coloration, and often are covered with sand while nesting, the turtles are often difficult to see when driving on the beach. Therefore, driving at a slower speed and being able to stop in a shorter distance would help prevent vehicles from colliding with nesting turtles, especially if they are nesting in the tracks where vehicles primarily travel on the beach, resulting in long-term beneficial impacts. However, the nesting population has increased substantially since 2006 and population models predict continued growth rates of 12 to 16 percent. This would result in more turtles on the beach creating greater potential for vehicles to interact or collide with nesting turtles. Therefore, being able to stop in a shorter distance upon seeing a turtle would provide greater long-term beneficial impacts if the population of nesting sea turtles continues to grow at the Seashore. Cumulative impacts would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

## **Birds**

As described in the Wildlife section and alternative 1 above, flushing impacts on birds from vehicles is more a function of their presence and their distance of approach rather than their speed. While the Seashore is not aware of any studies comparing flushing initiation distance for birds at vehicle speeds of 15 mph versus 25 mph, if a vehicle approaches close enough to a bird or flock of birds to cause them to flush, driving at a higher speed may cause them to flush slightly sooner and stay off their feeding/resting area slightly longer because the vehicle's approach may be perceived by the shorebirds as more alarming. However, it is not expected that the response would be substantially different for 15 mph than for 25 mph. In addition, the risk of vehicles colliding with shorebirds would likely be similar between the two speed limits, because collisions are rare at any speed due to the bird's flushing behavior and their flight initiation distances. Although some birds may not be able to avoid vehicles traveling at higher speeds as well as they could avoid a slower vehicle, there are no studies to support this. Therefore, reducing the speed limit to 15 mph during a portion of the year would not provide meaningful beneficial impacts on listed birds. Thus, overall, impacts on birds under alternative 2 would be short- and long-term negligible to minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and planned activities on special status birds using the Gulf beach would be as described for alternative 1 – long-term minor adverse. Despite the reduction in speed limit, cumulative impacts on federally and state listed birds under alternative 2 would be similar to those under alternative 1, and would be long-term minor adverse, as the speed of a vehicle does not substantially contribute to the impacts that vehicles on the beach have on shorebirds.

## **Conclusion**

The speed of a vehicle driving on the beach is not believed to substantially contribute to the overall impact on birds. It is the presence of the vehicle and the distance it approaches that causes a bird or flock of birds to flush. If speed contributes to the impact at all, a faster speed may cause a shorebird to flush sooner and stay in flight slightly longer. However, the birds would still readily return to their pre-disturbance behavior. Reduced vehicle speeds may reduce the severity of disturbance or injury, and the potential for collisions, but probably only negligibly. Therefore, reducing the speed limit through beach wide restrictions and safety zones would likely only contribute slight beneficial impacts and still result in

over all short- and long-term negligible to minor adverse impacts. Cumulative impacts would be long-term minor adverse.

### **IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Under alternative 3, the seasonal reduction in speed limit to 15 mph would be in place from March 1 through Labor Day (early September) each year. Outside of these dates (Labor Day through the end of February) the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph.

#### **Sea Turtles**

Impacts on sea turtles under alternative 3 would be more beneficial than under alternative 2, since under alternative 3 the lower speed limit would be enacted for a longer period of time and encompass the entire Kemp's ridley sea turtle nesting and hatching seasons. It would also encompass most of the nesting season and hatching season for the other four species of sea turtles that have nested at the Seashore, but as discussed under alternative 2, relatively few nests currently occur annually for these other species. Therefore, the added protection of a reduced speed limit would result in long-term beneficial impacts, particularly if the Kemp's ridley sea turtle nesting population continues to increase as it has since 2006, and grows at the recovery plan's predicted rate of up to 16 percent annually.

#### **Cumulative Impacts**

Cumulative impacts on sea turtles under alternative 3 would be long term beneficial, and slightly more beneficial than those described for alternatives 1 and 2, since alternative 3 would contribute more beneficial impacts from the additional protection that it would provide through a longer period of reduced speed limits.

#### **Conclusion**

Reducing the speed limit on the ocean beach to 15 mph allows vehicles to stop on average in approximately one half of the distance as compared to a vehicle traveling at 25 mph, thus affording nesting and stranded sea turtles and hatchlings emerging from undetected nests, which can often be difficult to see, greater protection from being impacted by vehicles driving on the beach. Alternative 3 extends the slower speed limit from March through early September encompassing the entire nesting and hatching season for Kemp's ridley and the majority of the nesting and hatching season for the other four sea turtles documented at the Seashore, though few of the other species currently nest on the beach additional beneficial impacts under alternative 3 would be more than for alternative 2 and would result in long-term beneficial impacts that would become greater if the Kemp's ridley sea turtle nesting population continues to increase as it has since 2006. Cumulative impacts would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

#### **Birds**

Under alternative 3, the extension of the 15 mph speed limit into March and early September would cover some of the spring and fall shorebird migration periods. However, as described above under alternative 2, a reduction in speed from 25 mph to 15 mph is not expected to result in appreciable beneficial impacts since the flushing of species due to vehicles is more a function of the presence of a vehicle and how close it approaches a bird or flock of birds than the speed at which it approaches the bird/flock. If speed contributes to the impact at all, a faster speed may cause a bird to flush sooner and stay in flight slightly longer. However, the birds would still readily return to their pre-disturbance behavior. Reduced vehicle

speeds may reduce the severity of disturbance or injury, and the potential for collisions due to drivers and birds having more time to react before a collision is imminent, but probably only negligibly. Therefore, impacts on shorebirds under alternative 3 would be short- and long-term negligible to minor adverse.

### **Cumulative Impacts**

The combined effect of other projects and planned activities on special status birds using the Gulf beach would be as described for alternative 1 – long-term minor adverse. Despite the reduction in speed limit, cumulative impacts on federally and state-listed birds under alternative 3 would be similar to those under alternative 2 and would be long-term minor adverse, as the speed of a vehicle does not substantially contribute to the impacts that vehicles on the beach have on birds.

### **Conclusion**

Because the speed of a vehicle driving on the beach does not substantially contribute to the overall impact that vehicles have on birds, extending the reduced speed limit from March through early September would not provide appreciable benefits to birds. If speed contributes to the impact at all, a faster speed may cause a bird to flush sooner and stay in flight slightly longer. However, the birds would still readily return to their pre-disturbance behavior. Reduced vehicle speeds may reduce the severity of disturbance or injury, and the potential for collisions due to drivers and birds having more time to react before a collision is imminent, but probably only negligibly. Thus, alternative 3 would have short- and long-term negligible to minor adverse impacts on birds. Cumulative impacts would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Under alternative 4, the speed limit for those areas open to vehicles on the Seashore's ocean beach would be 15 mph year-round; similar to that which is in place for all Texas beaches.

### **Sea Turtles**

Impacts on sea turtles under alternative 4 would be slightly more beneficial than for alternatives 2 and 3, since the lower speed limit of 15 mph would encompass the entire nesting and hatching seasons for Kemp's ridley and the other four species of sea turtles that have nested at the Seashore, and the entire time when sea turtles may strand alive on the beach. However, as discussed under alternative 3, very few of these other species currently nest at the Seashore, and the added protection of a year-round reduced speed limit would only result in slight beneficial impacts on these species. As a result, under current conditions alternative 4 would result in long-term beneficial impacts that would become greater if the Kemp's ridley sea turtle nesting population continues to increase as it has since 2006, and grows at the recovery plan's predicted rate of up to 16 percent annually.

### **Cumulative Impacts**

Cumulative impacts on sea turtles under alternative 4 would be long term beneficial, and slightly more beneficial than those described for alternatives 1, 2, or 3, since alternative 4 would contribute more beneficial impacts from the additional protection that it would provide through a year-round reduced speed limit.

### **Conclusion**

Reducing the speed limit on the ocean beach to 15 mph allows vehicles to stop on average in approximately one-half the distance as compared to a vehicle traveling at 25 mph, thus affording nesting

and stranded sea turtles and hatchlings emerging from undetected nests, which can often be difficult to see, greater protection from being impacted by vehicles driving on the beach. However, extending this speed reduction throughout the entire year would not appreciably increase the beneficial impacts on sea turtles as compared to alternative 3 since there are so few nests from all species of sea turtles that occur prior to March 1 or after Labor Day. As a result, alternative 4 would result in long-term beneficial impacts that would increase over time if the Kemp's ridley sea turtle nesting population continues to increase as it has since 2006. Cumulative impacts would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

## **Birds**

Alternative 4 would impose a 15-mph speed limit year-round, encompassing the entire spring and fall migration periods, species wintering at the Seashore, as well as summertime inhabitants. As discussed under the previous alternatives, a reduction in speed limit from 25 mph to 15 mph is not expected to result in appreciable beneficial impacts on birds since the flushing of species due to vehicles is more a function of the presence of a vehicle and how close it approaches a bird or flock of birds than the speed at which it approaches the bird/flock. If speed contributes to the impact at all, a faster speed may cause a bird to flush sooner and stay in flight slightly longer. However, the birds would still readily return to their pre-disturbance behavior. Reduced vehicle speeds may reduce the severity of disturbance or injury, and the potential for collisions due to drivers and birds having more time to react before a collision is imminent, but probably only negligibly. Therefore, impacts on birds under alternative 4 would be short- and long-term negligible to minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and planned activities on special status birds using the Gulf beach would be as described for alternative 1 – long-term minor adverse. Despite the reduction in speed limit cumulative impacts on federally and state listed shorebirds under alternative 4 would be similar to those under alternatives 2 and 3 and would be long-term minor adverse, as the speed of a vehicle does not substantially contribute to the impacts that vehicles on the beach have on birds.

## **Conclusion**

Because the speed of a vehicle driving on the beach does not substantially contribute to the overall impact that vehicles have on birds, extending the reduced speed limit year-round would provide only slight additional benefits to birds. If speed contributes to the impact at all, a faster speed may cause a bird to flush sooner and stay in flight slightly longer. However, the birds would still readily return to their pre-disturbance behavior. Reduced vehicle speeds may reduce the severity of disturbance or injury, and the potential for collisions due to drivers and birds having more time to react before a collision is imminent, but probably only negligibly. Thus, impacts on birds would be short- and long-term negligible to minor adverse. Cumulative impacts would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTION A**

Speed limits under this alternative would be similar to those under alternative 1, with the speed limit for North Beach and from mile marker 0 to 2.5 on South Beach being 15 mph year-round, and the speed limit from mile marker 2.5 to Mansfield Channel being 25 mph. However, under this alternative, year-round safety zones would be implemented for those areas within 100 feet of people, pets, parked vehicles and structures. Within the safety zone vehicles would be required to slow to 15 mph.

## Sea Turtles

Impacts on sea turtles under this alternative would be similar to those under alternative 1, the no action alternative, because the safety zones under this alternative would not apply to wildlife; therefore, vehicles would not be required to slow to 15 mph in the vicinity of sea turtles. With the safety zones, however, vehicles on the beach would be required to travel at 15 mph more often than under alternative 1 where the speed limit south of mile marker 2.5 would always be 25 mph. This would provide some beneficial impacts on the sea turtles, because if turtles are located in the vicinity of people, pets, parked vehicles or structures, the beach driving vehicles would be traveling at the slower speed limit and have a greater chance of stopping or avoiding impacting a turtle once it is seen. However, as one moves further south down the beach, there are fewer occurrences of people or other objects that would require a safety zone, as more than 50 percent of visitors driving on the beach do not venture beyond mile marker 10 and nearly 72 percent do not drive past mile marker 20 (Scott and Lai 2004). Conversely, since 2006 approximately 76 percent of all turtle nests have been found south of mile marker 20. Additionally, it is known that the presence of vehicles, people, pets, etc., can deter sea turtles from nesting, so it is less likely that turtles would be located in areas where speed limits would be reduced to 15 mph due to safety zones as defined in this alternative. All of these factors would minimize any potential benefits to sea turtles realized from safety zones for hazards other than wildlife. Thus, impacts from alternative 5, option A, would be long-term minor adverse with the potential to become long-term minor to moderate adverse if the Kemp's ridley nesting population continues to increase at the Seashore as it has since 2006 and grow at the recovery plan's predicted rate of up to 16 percent annually.

## Cumulative Impacts

The combined effect of other projects and planned activities on sea turtles using the Gulf beach would be as described for alternative 1, which include long-term negligible to minor adverse, as well as beneficial impacts. When combined with the impacts from alternative 5, cumulative impacts on sea turtles under would be very similar to those described for alternative 1 and would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

## Conclusion

While alternative 5, option A, would implement 100-foot, 15 mph safety zones around hazards such as people, parked vehicles, pets, and structures, it would not include wildlife. And while these safety zones would mean that vehicles are traveling at 15 mph in more areas along the Seashore, the beneficial impact on sea turtles would be reduced because the safety zone does not include wildlife. Because vehicles cannot stop as quickly traveling 25 mph as 15 mph, the impacts under alternative 5, option A, on sea turtles would be long-term minor adverse with the potential to become long-term minor to moderate adverse if the Kemp's ridley sea turtle nesting population continues to increase as it has since 2006. Cumulative impacts would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

## Birds

As discussed under the previous alternatives, vehicle speed is not believed to play a primary role in vehicle-induced flushing events of shorebirds. As a result, not including wildlife in the criteria for defining safety zones would not substantially affect bird species compared those alternatives that incorporate some form of speed reduction for wildlife. Therefore, impacts under this alternative would be similar to alternative 1 and would be short- and long-term minor adverse.

## **Cumulative Impacts**

The combined effect of other projects and planned activities on special status birds using the Gulf beach would be as described for alternative 1 – long-term minor adverse. Cumulative impacts under alternative 5, option A, would be similar to those under alternative 1 and would be long-term minor adverse.

## **Conclusion**

While alternative 5, option A, would not provide safety zones around wildlife, the speed of a vehicle does not contribute substantially to impacts on birds, therefore impacts under alternative 5 would be similar to alternative 1, with short- and long-term minor adverse impacts. Cumulative impacts would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE MODIFIED, OPTION B**

This alternative is similar to alternative 5, option A, in that the speed limit for North Beach and from mile marker 0 to 2.5 on South Beach would be 15 mph year-round, and the speed limit from mile marker 2.5 to Mansfield Channel would be 25 mph with safety zones around people, pets, parked vehicles and structures where the speed limit would be reduced to 15 mph. However, under this alternative, safety zones would also be enforced around wildlife.

## **Sea Turtles**

The types of impacts on sea turtles from vehicles driving on the beach would be nearly the same as described in detail under alternative 1. While including safety zones around wildlife may serve to keep drivers more alert than a single speed and may have some small effect on the drivers ability to recognize and avoid nesting Kemp's ridley sea turtles, the primary impact would still be vehicles colliding with nesting Kemp's ridley sea turtles since the Seashore relocates all nests to either a protective corral on the beach or to their incubation facility. Other vehicle collisions could occur with stranded sea turtles and hatchlings emerging from undetected nests. Nests could also be driven over prior to detection. If nester tracks are driven over, it can make nest detection and protection more difficult or impossible. Requiring vehicles to slow down to 15 mph in safety zones around wildlife would provide some measure of beneficial protection to nesting and stranded sea turtles, and hatchlings emerging from undetected nests, or nests that have not been protected. As discussed earlier, the Kemp's ridley, the primary nester at the Seashore, is the smallest of all of the sea turtles with a carapace width of 2 feet and a low stature of 9 inches, often making it difficult to see due to its size. Its coloration, which blends in with the sand and vegetation, and the fact that it often becomes partially covered in sand during the nesting process also make it difficult to see the turtle from a distance. While there are no studies that indicate just how far away a sea turtle can be seen on the beach, often times it is at a distance shorter than 100 feet. With an average stopping distance of slightly more than 100 feet, which is slightly more than the safety zone distance, if a turtle (nesting, stranded, or hatchling emerging from an undetected nest) is in the path of a vehicle traveling at 25 mph, the vehicle would not be able to stop in time to avoid hitting or impacting the sea turtle. It may also be difficult to slow down and avoid hitting the turtle by driving around it. In areas lower on the beach where the sand is firmer vehicles would likely have an easier time slowing down and changing direction to drive around a turtle than in areas higher up on the beach where the sand is softer. In these areas, vehicles often travel in the ruts of previous vehicles and trying to change direction in the rutted, soft sand can be difficult and sometimes dangerous if attempted to quickly. At 25 mph, a vehicle will travel 33 feet at a minimum before brakes and/or other evasive driving actions are engaged, assuming a 1.5-second reaction time, which would often leave little distance to effectively and safely change direction to avoid hitting a sea turtle. If the Kemp's ridley nesting population continues to increase at the

Seashore and grow at the population model predicted rate of 12 to 16 percent annually, the potential for vehicle-turtle interactions would also increase. Because the sea turtles can be difficult to see and the 100 foot safety zone is slightly less than the stopping distance for a vehicle traveling at 25 mph, the benefits of including safety zones around wildlife would be minimized, but there would be long-term beneficial impacts on sea turtles. However, these beneficial impacts would be less than those for alternatives 2, 3, and 4.

### **Cumulative Impacts**

Cumulative impacts on sea turtles under alternative 5, option B, would be very similar to those described for alternative 1, though the safety zone around wildlife would provide some small additional benefits compared to alternative 1. However, the overall long-term beneficial cumulative impacts would be primarily due to the protection and enhanced hatching success rate that the turtle recovery program provides.

### **Conclusion**

Alternative 5, option B, would implement 100-foot, 15-mph safety zones around hazards such as people, parked vehicles, pets, structures and wildlife. While safety zones around wildlife, including sea turtles, would provide beneficial impacts, these impacts would be minimized by the fact that the average stopping distance of a vehicle traveling at 25 mph is slightly more than 100 feet, and thus slightly longer than the safety zone. As a result, if a turtle is in the direct path of a vehicle traveling at 25 mph, the vehicle would not be able to stop in time to avoid hitting or impacting the sea turtle and it may also be difficult to slow down and avoid hitting the turtle by driving around it, especially in areas higher up on the beach where the sand is soft and vehicles often drive in the ruts of previous vehicles. Therefore the overall impacts would be long-term beneficial, but to a lesser degree than in other action alternatives. Cumulative impacts would be long-term beneficial, primarily from the protection and enhanced hatching success rate that the turtle recovery program provides.

### **Birds**

As noted earlier, vehicle speed is not believed to play a major role in why vehicles driving on the beach flush birds. As a result, including wildlife in the criteria for defining safety zones would not affect bird species appreciably. Therefore, impacts under this alternative would be similar to all of the other alternatives and would be short- and long-term negligible to minor adverse.

### **Cumulative Impacts**

Cumulative impacts under alternative 5, option B, would be similar to those under alternative 1 and would be long-term minor adverse.

### **Conclusion**

Though alternative 5, option B, would provide for 100 foot, 15-mph safety zones around wildlife, the speed of a vehicle would not contribute substantially to impacts on birds, therefore impacts under alternative 5, option B, would be similar to alternative 2, short- and long-term negligible to minor adverse impacts. Cumulative impacts would be long-term minor adverse.



# VISITOR USE AND EXPERIENCE

## METHODS AND ASSUMPTIONS

Impacts on visitor use and experience were determined by considering the effect of the existing conditions and the proposed speed limit changes. The analysis considered the current uses of the Seashore and the potential impact the various speed limit restrictions would have. The analysis relied on current information from the Seashore, feedback from interviews conducted as part of the socioeconomics analysis, and professional judgment.

### Study Area

The geographic study area for visitor use and experience is within the North and South Beach portions of the Seashore where vehicle use is permitted.

### Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on visitor use and experience and duration of impacts:

- Negligible:* Visitors would likely be unaware of impacts associated with proposed changes. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.
- Minor:* Changes in visitor use or experience would be slight and detectable, but would not appreciably limit any critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- Moderate:* A few critical characteristics of the existing visitor experience would change, and the number of visitors engaging in a specified activity would be altered. Some visitors participating in that activity or visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction at the Seashore would begin to decline.
- Major:* Many critical characteristics of the existing visitor experience would change, and visitor satisfaction would be substantially decreased. The number of visitors engaging in a specified activity would be substantially altered. Many visitors participating in an activity or visitor experience would not be able to pursue their choices in other local or regional areas.
- Duration:* Short-term impacts would occur sporadically throughout a year, but would generally last no more than three weeks per year.  
  
Long-term impacts would occur more than three weeks per year and likely for consecutive years.

## IMPACTS OF ALTERNATIVE 1: NO ACTION

Under alternative 1, the speed limit would be a continuation of the management policies prior to the temporary seasonal restrictions implemented in 2009 and 2010. The speed limit would continue to be

15 mph on North Beach and from mile marker 0 to 2.5 on South Beach. Once beach drivers are beyond the 2.5 mile marker, the speed limit would be 25 mph until visitors reached Mansfield Channel. The beach would continue to be closed during high tide and storm events. As a result, alternative 1 would result in no impacts on visitor use and experience.

### **Cumulative Impacts**

Since no impacts are projected under alternative 1, no cumulative impacts would occur.

### **Conclusion**

Implementation of alternative 1 would result in no impacts on visitor use and experience from the continuation of current management of the beach vehicles at Padre Island National Seashore. There would be no cumulative impacts on visitor use and experience under alternative 1.

### **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

Under alternative 2, the 15 mph speed limit would be extended from mile marker 2.5 to Mansfield Channel from approximately mid-April through mid-July. Outside of this time, beach drivers south of mile marker 2.5 would be required to adhere to the 15 mph speed limit when the vehicle is within 100 yards of people, pets, vehicles, structures, campsites, flocks of birds, and other wildlife. Beach drivers on North Beach would continue to adhere to a 15 mph speed limit.

The majority of beach drivers, at just over 50 percent of all beach drivers, stay within the first ten miles of South Beach and would experience negligible adverse impacts from the seasonally reduced speed limit. Those visitors staying within the first 10 miles of the Seashore would require approximately ten additional minutes to reach their destination under the 15 mph speed limit restriction. Nearly 85 percent of all beach drivers stay within the first 30 miles of South Beach and would experience up to 40 minutes of additional driving time to reach their destination during the 15 mph speed restrictions, but would not experience a long delay, resulting in long-term negligible adverse impacts.

The reduction in speed limit during the sea turtle nesting season would result in a longer travel time from mile marker 2.5 to Mansfield Channel. Approximately 11 percent of visitors who drive on the beach at Padre Island National Seashore, or approximately 1 percent of all visitors, reach mile markers 50 – 60 (Scott and Lai 2004). Those beach users wishing to reach Mansfield Channel would be expected to experience approximately 1.6 hours of additional driving, or a little over three hours of additional driving round trip which would increase driving time by 60 percent. Visitors wishing to travel to the Seashore, recreate at Mansfield Channel, and return home in one day during the shorter seasonal restrictions may no longer be able to do so. During the shorter seasonal restrictions, these visitors would experience a long-term moderate adverse impact; however, due to the short duration of the seasonal restriction, overall impacts on this user group would be long-term minor adverse.

The Seashore has received complaints from visitors regarding vehicles traveling by other vehicles, camps, pedestrians, and pets at high rates of speed, and negatively impacting their visitor experience (Lindsay 2011b; Poulson 2011). Thus, those visitors would experience beneficial impacts due to the 15 mph speed limit during the shorter seasonal restrictions and the 100-yard safety zones outside of that time.

Under alternative 2, visitors on South Beach would experience long-term negligible to minor adverse impacts due to the additional driving time required to reach the desired destination along the Seashore. These adverse impacts would only be experienced during the seasonal restrictions, however, and would

not impact visitor use and experience outside of the seasonal speed limit. The seasonal speed limit restriction would not include Labor Day weekend and winter fishing tournaments, which are both periods of high visitor use. However, 15 mph would always be in place within at least 100 yards of other vehicles, camps, pedestrians, and pets, thereby enhancing visitor experience during that time.

## **Cumulative Impacts**

Other projects occurring in Padre Island National Seashore, including beach debris clean-up activities and the Kemp's Ridley Sea Turtle Recovery Program would contribute long-term beneficial impacts on visitor use and experience by providing a safer, cleaner beach and a viable turtle population that supports visitor activities related to the turtle recovery program, including hatchling release activities that are popular with Seashore visitors from around the world. This ecotourism event attracted more than 4,000 visitors in 2010. Ongoing oil and gas activities at the Seashore would contribute intermittent but long-term minor adverse impacts on visitor use and experience from convoy presence and noise from trucks within the Seashore. Impacts from these cumulative actions would result in long-term beneficial impacts on visitor use and experience. Alternative 2 would have long-term negligible to minor adverse impacts and long-term beneficial impacts on visitor use and experience. When combined with the impacts from the cumulative actions, there would be overall long-term beneficial cumulative impacts on visitor use and experience.

## **Conclusion**

Implementation of alternative 2 would result in long-term negligible to minor adverse impacts on visitor use and experience as a result of additional travel time required under the lower speed limit and long-term beneficial impacts on other users who are concerned about fast-moving vehicles on the beach. Cumulative impacts on visitor use and experience would be long-term beneficial.

## **IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Alternative 3 would also implement seasonal speed limit restrictions; however the seasonal restrictions would be in place for a longer period. From March 1 through Labor Day (early-September) beach drivers would be required to adhere to the 15-mph speed limit. Unlike alternative 2, alternative 3 does not include the 100-yard safety zone requirement and, therefore, drivers would be able to maintain a speed of 25 mph at all times from Labor Day (early-September) through February 28.

Similar to alternative 2, those visitors remaining within the first 30 miles of South Beach would experience long-term negligible adverse impacts due to the additional driving time required to reach their destination.

Also similar to alternative 2, those visitors wishing to travel to Mansfield Channel and back within one day would have less time to spend at the Mansfield Channel during the seasonal restriction or may not be able to complete the trip in one day, resulting in long-term moderate adverse impacts. Under alternative 3, visitors to the Seashore over Labor Day weekend would be required to drive at the reduced speed limit, although the 25-mph speed limit would be restored for winter fishing tournaments and events, which are often further down island and would not extend travel time during that period.

Similar to alternative 2, those visitors who are concerned about fast-moving vehicles would experience beneficial impacts due to the 15 mph speed limit during the seasonal restriction that includes the busiest visitor use times during the year, a beneficial impact.

Overall, alternative 3 would result in long-term negligible to minor impacts on visitor use and experience due to the additional driving time required to reach the desired destination beyond mile marker 2.5. Although the seasonally restricted period would result in moderate adverse impacts for a relatively small segment of Seashore users during that 6-month period (see table 7 and figure 21 for percentage of visitors traveling down island); this would not impact visitor use and experience outside of those 6 months, which includes the popular fall fishing season, so overall adverse impacts on this user group would be considered minor on a year-round basis. Also, there would be benefits to those visitors who are concerned about fast-moving vehicles on the beach.

### **Cumulative Impacts**

Effects to visitor use and experience from cumulative actions would be the same as described under alternative 2, resulting in an overall long-term beneficial impact on visitor use and experience.

### **Conclusion**

Impacts on visitor use and experience under alternative 3 would be similar to impacts under alternative 2, with long-term negligible to minor adverse impacts as a result of speed limit restrictions and long-term benefits to another segment of the visitor population who have complained about fast-moving vehicles on the beach. Cumulative impacts on visitor use and experience would be long-term beneficial.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Under alternative 4, the speed limit for drivers along the South Beach portion of the Seashore would be required to adhere to a 15-mph speed limit year-round. The majority of South Beach drivers traveling only within the first 30 miles of the beach would experience long-term negligible adverse impacts from the additional driving time required with each visit. Similar to alternatives 2 and 3, the approximately 11 percent of visitors wishing to reach mile marker 50 to the Mansfield Channel would experience 3 hours of additional driving time, round trip, every time they visited the Seashore. These visitors, which account for approximately 11 percent of visitors using South Beach, or about 1 percent of the total number of visitors to the park, could potentially be expected to change their visitor use patterns, and alternative 4 may result in fewer vehicles traveling down island to mile marker 50 to the Mansfield Channel. As a result, alternative 4 would result in long-term moderate adverse impacts on this user group. Similar to the other action alternatives, there would be long-term benefits to another segment of the visitor population who are concerned about fast-moving vehicles on the beach, and this alternative would include all high visitor use periods and events.

### **Cumulative Impacts**

Effects to visitor use and experience from cumulative actions would be the same as described under alternative 2, however, alternative 4 has potential moderate adverse effects on one user group year-round. In conjunction with other impacts on visitor use and experience from other park operations and development, alternative 4 would have long-term negligible adverse impacts on visitor use and experience.

### **Conclusion**

Impacts on most users under alternative 4 would be similar to impacts under alternative 3, with long-term negligible to moderate adverse impacts as a result of speed limit restrictions, and long-term benefits to

another segment of the visitor population who are concerned about fast-moving vehicles on the beach. Cumulative impacts on visitor use and experience would be long-term negligible adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTIONS A AND B**

Under alternative 5, the speed limit would also be a continuation of the management policies prior to the temporary seasonal restrictions implemented in 2009 and 2010. Similar to the alternative 1, the speed limit would continue to be 15 mph on North Beach and from mile marker 0 to 2.5 on South Beach. Once beach drivers are beyond the 2.5 mile marker, the speed limit would be 25 mph until visitors reached Mansfield Channel. The beach would continue to be closed during high tide and storm events. Similar to alternative 2, alternative 5 would implement a safety zone year-round. The safety zone would require beach drivers to reduce their speed to 15 mph within 100 feet of a person not in a vehicle, pet, parked vehicle, or a structure under Option A; Option B adds wildlife to that list.

Alternative 5 would potentially result in additional driving time for visitors wishing to travel to any point down island due to the additional time spent slowing down for safety zones along the way but is not expected to increase the driving time substantially. Under alternative 5, a year-round speed limit of 15 mph would be in effect within the 100-foot zone safety for people not in a vehicle, people in a parked vehicle or structure, and pets, thereby enhancing visitor experience of other people within those zones, a long-term benefit. However, the speed limit would remain 25 mph near moving vehicles. As a result, alternative 5 would result in long-term negligible adverse impacts on visitor use and experience.

### **Cumulative Impacts**

Effects to visitor use and experience from cumulative actions would be the same as described under alternative 2. When combined with the long-term negligible adverse impacts from alternative 5, cumulative impacts under alternative 5 would be long-term beneficial.

### **Conclusion**

Implementation of alternative 5 would result in long-term negligible adverse impacts on visitor use and experience due to the implementation of the safety zone speed restriction, with long-term beneficial impacts on other users who are concerned about fast-moving vehicles on the beach. Cumulative impacts on visitor use and experience would be long-term and beneficial.

## **SEASHORE OPERATIONS AND MANAGEMENT**

### **METHODS AND ASSUMPTIONS**

Park management and operations, for the purpose of this analysis, refer to the quality and effectiveness of Seashore staff to maintain and administer Seashore resources and provide for an appropriate visitor experience. The impact analysis is based on the current description of Seashore operations presented in “Chapter 3: Affected Environment” of this document.

### **Study Area**

The geographic study area for Seashore operations and management is within the North and South Beach portions of the Seashore.

## Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on Seashore management and operations and duration of impacts:

*Negligible:* Park operations would not be affected or an action would have no measurable impact on operations in the Seashore.

*Minor:* Effects to Seashore operations would not be readily apparent and difficult to measure. The impacts on Seashore operations and budget would have little material effect on other ongoing Seashore operations.

*Moderate:* Effects to Seashore operations would be readily apparent and would measurably affect Seashore operations. The changes would be noticeable to Seashore staff and visitors. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

*Major:* Effects to Seashore operations would be readily apparent and would result in a substantial change to Seashore operations. The changes would be noticeable to Seashore staff and visitors and be markedly different from existing operations. Mitigation measures would be necessary to offset adverse effects, and their success could not be guaranteed.

*Duration:* Short-term impacts would occur during the initial introduction of the regulation, lasting approximately three months.

Long-term impacts would persist after implementation of the alternative.

## IMPACTS OF ALTERNATIVE 1: NO ACTION

Under alternative 1, current management would continue at the Seashore. Law enforcement rangers would continue to be responsible for visitor compliance with beach driving regulations, including enforcing the speed limit. Law enforcement staff would perform routine patrols of beach areas, respond to violations, and respond as emergency medical technicians for all visitor and employee injuries. Law enforcement staff would maintain the current schedule for beach patrols. Maintenance staff would continue to perform the existing maintenance duties, including upkeep of the existing signs and removal of trash and containers of hazardous materials along the Seashore. As a result, there would be no changes in Seashore operations and management, and thus no impact on these functions.

## Cumulative Impacts

Because no impacts are projected under alternative 1, no cumulative impacts would occur.

## Conclusion

Implementation of alternative 1 would result in no impact on Seashore operations and management from the continuation of current maintenance, staffing, and ease of enforcement. There would be no cumulative impacts on Seashore operations and management.

## **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH “SAFETY ZONE” MANAGEMENT**

Under alternative 2, Seashore rangers would need to adjust their patrol schedule to account for reduced speeds during the seasonal speed limit restriction. The rangers would need additional time to traverse South Beach during those restrictions. Law enforcement vehicles are permitted to speed when responding to an incident and therefore response time would not be impacted. Short-term impacts from alternative 2 would include a public awareness campaign during the rollout of the seasonal restrictions to ensure all beach users are aware of speed limit changes. Additionally, Seashore rangers would need to receive training for how to enforce the 100-yard safety zone element. These impacts would be short-term minor adverse during the first few months of implementation.

Similarly, Facility Management staff would require additional time for performing standard maintenance tasks, such as removal of beach debris and hazardous materials, retrieving broken down Seashore vehicles, and maintenance of down island facilities and signs. With alternative 2, additional signage would be required to inform visitors of the speed limit restriction and safety zone regulation and when the 15 mph speed limit is put into place each year. Signs indicating the 15 mph speed limit would have to be installed immediately upon finding the first nest of the year or on April 15, whichever is earlier. Currently, signs require replacement approximately once a year due to normal deterioration. New signage under this alternative would increase the annual budget required to replace signs annually. Park staff would also monitor trends along the Seashore over time to assess the effectiveness of the seasonal speed restriction.

During the reduced speed limit period, Facility Management staff would experience an increase in travel time during their daily activities. Similar to visitor use, impacts from the increase in travel time would range from negligible to moderate, depending how far down island staff needed to go. Throughout the year, Facility Management staff conducts hazardous materials clean-up runs which currently require a full day to complete. Under a 15 mph speed limit, this task would take two days to complete, including an overnight stay, resulting in a long-term moderate adverse impact on Seashore operations and management. Facility Management tasks would not be impacted outside of the reduced speed limit time period.

Division of Science and Resource Management staff response time for rescues of sea mammals and other wildlife would take additional time. Extra time would be required for resource monitoring and research projects for staff as well as non-government researchers resulting in a long-term negligible to minor adverse impact.

Overall, alternative 2 would result in long-term negligible to moderate adverse impacts on Seashore operations and management due to the additional cost of sign maintenance and additional time required for Seashore staff to perform duties along South Beach, and for additional time and budget for the law enforcement division to be trained in enforcement of the 100-yard buffer.

### **Cumulative Impacts**

One future project, the acquisition of GLO lands, has the potential to impact Seashore operations and management within Padre Island National Seashore. The proposed acquisition would result in long-term negligible adverse impacts on Seashore operations and management due to the increased area for the Seashore to manage with existing Seashore funding and resources. Alternative 2 would have short- and long-term negligible to moderate adverse impacts on Seashore operations and management. When combined with the impacts from the cumulative actions, alternative 2 would result in an overall long-term minor adverse impact on Seashore operations and management.

## **Conclusion**

Implementation of alternative 2 would result in short- and long-term negligible to moderate adverse impacts on Seashore operations and management. Cumulative impacts on Seashore operations and management would be long term minor adverse.

## **IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)**

Impacts on Seashore operations and management under alternative 3 would be generally similar to alternative 2. Under alternative 3, however, additional staff training would not be required, as the 100-yard safety buffer element would not be implemented. A public information campaign during the initial rollout of the alternative would be required, but since alternative has clearly defined start and end dates for restrictions and no safety zone element, the alternative would be easier to convey and would result in short-term negligible adverse impacts on Seashore operations and management. Costs for the purchase and maintenance of additional signs would be similar to alternative 2, with new informational signs regarding the seasonal speed limit restriction being replaced annually. Facility Management and Law Enforcement staff would be required to adjust maintenance and patrol schedules during the seasonal speed limit restrictions to account for longer travel times along South Beach.

Similar to alternative 2, Facility Management staff would require additional time for performing standard maintenance tasks, such as removal of beach debris and hazardous materials, retrieving broken down Seashore vehicles, and maintenance of down island facilities and signs. With alternative 2, additional signage would be required to inform visitors of the speed limit restriction and when the 15 mph speed limit is put into place each year. Park staff would also monitor trends along the Seashore over time to assess the effectiveness of the seasonal speed restriction.

Overall, alternative 3 would result in long-term negligible to moderate adverse impacts on Seashore operations and management due to the additional cost of sign maintenance and additional time required for Seashore staff to perform duties along South Beach. Short-term negligible adverse impacts would be expected during the initial rollout of the alternative during the public information campaign.

## **Cumulative Impacts**

Effects to Seashore operations and management from cumulative actions would be the same as described under alternative 2. When combined with the short-term negligible adverse and long-term negligible to moderate adverse impacts from alternative 3, cumulative impacts would be long-term minor adverse.

## **Conclusion**

Impacts on Seashore operations and management under alternative 3 would be similar to impacts under alternative 2, with short-term negligible adverse impacts during the initial public information campaign and long-term negligible to moderate adverse impacts on Seashore operations and management from the cost of additional signage and travel time for Seashore staff performing regular duties. Cumulative impacts on Seashore operations and management would be long-term minor adverse.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Impacts on Seashore operations and management under alternative 4 would be similar to alternative 3, but with a more adverse effect on operations requiring longer trips or travel down island. Costs for the



purchase and maintenance of additional signs would be similar to alternative 1, with no change to the existing signs. The existing sign for the 25 mph posted speed limit would be altered to 15 mph, which would be similar to the annual sign replacement duties and budget. A public information campaign during the initial rollout of the alternative would be required, but since alternative 4 has one consistent limit, the alternative would be easier to convey. Facility Management, Resource Management and Law Enforcement staff would be required to adjust schedules permanently to account for longer travel times along South Beach year-round. Facility Management staff would require additional time for performing all tasks year round, including all hazardous materials clean-up runs, which would always require two work days, including an overnight stay. Seashore staff would not be able to schedule work projects down island to avoid speed limit reduction periods. Alternative 4 would be the easiest alternative for the Seashore to implement and for law enforcement to enforce, however, the additional time and money required to conduct routine Seashore maintenance would result in long-term moderate adverse impacts on Seashore operations and management.

Overall, alternative 4 would result in long-term moderate adverse impacts on Seashore operations and management due to the additional time required for Seashore staff to perform duties along South Beach.

### **Cumulative Impacts**

Effects to Seashore operations and management from cumulative actions would be the same as described under alternative 2. When combined with the long-term moderate adverse impacts from alternative 4; cumulative impacts would be long-term moderate adverse.

### **Conclusion**

Impacts on Seashore operations and management under alternative 4 would have long-term moderate adverse impacts on Seashore operations and management. Cumulative impacts on Seashore operations and management would be long-term moderate adverse.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTIONS A AND B**

Impacts on Seashore operations and management under alternative 5 would be similar to alternative 2. Under alternative 5 additional training for staff would be required to determine how to enforce the 100-foot safety zone buffer along South Beach. Similar to alternative 2, there would be a short-term minor adverse impact on Seashore operations and management during the initial public information campaign for the alternative. Unlike alternative 2, no schedule shifts or changes would be required as the speed limit would not change and staff would continue to perform duties at the current pace. A slight increase in travel time may be experienced during peak visitor use and within the first 20 miles of the beach, where more visitors, campsites, and pets are concentrated, but this increase would be negligible. Costs for the purchase and maintenance of additional signs to display the new safety zone requirements would be similar to alternative 2, with new informational signs being replaced annually due to normal deterioration.

Overall, alternative 5 would result in short-term minor and long-term negligible adverse impacts on Seashore operations and management from the increased training to enforce the 100-foot safety buffer, initial public information campaign, and additional sign maintenance.

## Cumulative Impacts

Effects to Seashore operations and management from cumulative actions would be the same as described under alternative 2. When combined with the short-term minor and long-term negligible adverse impacts from alternative 5, cumulative impacts would be long-term negligible adverse.

## Conclusion

Impacts on Seashore operations and management under alternative 5 would have short-term minor and long-term negligible adverse impacts from the law enforcement training, initial public information campaign, cost and maintenance of additional signs, and enforcement of the 100-foot safety buffer. Cumulative impacts on Seashore operations and management would be long-term negligible adverse.

## SOCIOECONOMICS

### METHODS AND ASSUMPTIONS

Socioeconomic data, a literature review, interviews with local businesses as well as planned and proposed projects within close vicinity to the Seashore as identified by NPS staff were considered in identifying and discussing the potential for socioeconomic effects of the action alternatives. Planning team members applied experience and professional expertise and judgment to analyze potential impacts that would result from the various project alternatives on the existing social and economic conditions in the vicinity of the project area.

### Study Area

The study area for this analysis is Nueces County, which hosts the major gateway community of Corpus Christi and communities located on North Padre Island.

### Impact Definitions

The following definitions were used to assess the intensity of adverse impacts on socioeconomics and duration of impacts. In the development of these definitions, it was assumed that adverse impacts are those that most individuals or groups would generally recognize as diminishing economic welfare, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of adverse effects include a decrease in annual revenue at local business establishments, fewer job opportunities, and increases in cost of living without matching increases in higher income. Beneficial impacts, which are addressed qualitatively, are those that individuals or groups would accept or recognize through increased economic activity, either in general or for a specific group of people, businesses, organizations, or institutions.

*Negligible:* Very few individuals, businesses, or government entities would be impacted. Impacts would be nonexistent, barely detectable, or detectable only through indirect means and with no discernable impact on regional economic conditions.

*Minor:* A few individuals, businesses, or government entities would be impacted. Impacts would be small but detectable, limited to a small geographic area, comparable in scale to typical year-to-year or seasonal variations, and not be expected to substantively alter economic conditions over the long term.

*Moderate:* Many individuals, businesses, or government entities would be impacted. Impacts would be readily apparent and detectable across a wider geographic area and may have a noticeable effect on economic conditions over the long term.

*Major:* A large number of individuals, businesses, or government entities would be impacted. Impacts would be readily detectable and observed, extend across much of the study area, and would have a substantial influence on economic conditions over the long term.

*Duration:* Short-term impacts would be immediate, occurring within three months of implementation of the alternative.

Long-term impacts would persist after implementation of the alternative.

## **IMPACTS OF ALTERNATIVE 1: NO ACTION**

Under alternative 1 the speed limit on North Beach and from mile marker 0 to mile marker 2.5 on South Beach would continue to be 15 mph. The speed limit from mile marker 2.5 to Mansfield Channel would continue to be 25 mph. Under this alternative, people would continue to travel down island on South Beach to enjoy fishing or surfing, in a remote setting. Based on a 2004 visitor study, monthly NPS visitor counts have estimated that between 10 and 15 percent of Seashore visitors drive onto South Beach. Of those driving onto South Beach, approximately 15.8 percent of those travel past mile marker 31, while approximately 52 percent of the visitors only travel within the first ten miles of South Beach (Scott and Lai 2004).

A 1987 visitor study found a considerably lower number of down island visitors (3.0 percent) travel south of mile marker 30 (Ditton and Gramann 1987). Using these percentages in combination with the 15.0 percent of visitors who travel on South Beach, it is estimated that between 2,890 and 15,219 people visited areas south of mile marker 30 in 2009. NPS staff estimates there to be between three and five vehicles at Mansfield Channel at any one given time (NPS 2010f). Assuming a stay of two days and two to five people per vehicle this totals between 1,095 and 4,563 people down island per year. Therefore estimates of down island visitation vary considerably with a low estimate of 1,000 to a high estimate of 15,000 visitors annually.

These down island visitors, primarily anglers, are typically from local communities, including Corpus Christi, many of whom visit multiple times per year. However, it is understood that there are likely some down island visitors that come from locations further away, such as San Antonio, who may also frequent areas down island more than once annually (NPS 2010f).

As mentioned in chapter 3, Seashore visitor spending – both local and non-local – totaled \$43.8 million in 2008. This spending – 95.2 percent of which is from non-local visitors – includes purchase of a variety of goods and services in the local economy (Stynes 2009). This includes hotel stays, dining, retail, gas, and other goods and services. Non-local visitors represent approximately 81 percent of the visits to the Seashore (Lee 2009), and introduce new or additional spending to the area. Local visitors to the Seashore (i.e. those who live in local communities) also spend money in the region's economy, though it is usually considerably less than non-local visitors, for they are typically employed locally, and while their spending contributes to the local economy, much of their economic contribution cannot be associated with visits to the Seashore.

Fishing is one of the primary activities enjoyed by down island Seashore visitors. It has been estimated that a group of 2-3 vehicles having 7-8 passengers purchases between \$100 and \$150 on bait and tackle supplies (LBG 2010). Additional purchases may include food, beverages, and gas, among other goods and services. Local fishermen are likely already purchasing food and beverages in the local economy so additional spending associated with down island visits would be primarily associated with bait and tackle supplies and may introduce only a small amount of revenue into the local economy. Because down island visitors represent a small percentage of total Seashore visitors and spending by local fisherman on goods and services associated with fishing activities over and above daily spending patterns is estimated to be relatively low, it is anticipated that down island spending accounts for a very small portion of the visitor spending to the Seashore.

Under alternative 1, visitors would be able to enjoy the Seashore's resources in the same way as they could prior to the 2009 and 2010 temporary seasonal restrictions were put in place. They would continue to spend their money in the local market, contributing to the region's jobs and income. In 2008, there were an estimated 839 jobs, \$16.6 million in labor income, and \$25.8 million in Gross Regional Product supported by non-local visitation to the Seashore (Stynes 2009). Seashore visitor spending accounts for approximately 4 percent of tourism and travel visitor spending in the Corpus Christi MSA, and approximately 4 percent of the jobs supported by this spending (Lee 2009). Under alternative 1, it is anticipated that that this level of visitation and visitor spending would continue, providing for short- and long-term socioeconomic benefits experienced by tourism-based businesses within close proximity to the Seashore.

### **Cumulative Impacts**

Other past, present, and future trends and activities could affect socioeconomic resources in the region. Because the local economy depends on tourism to a large extent, trends and actions that are either beneficial or adverse, as discussed in "Visitor Use and Experience," would have an impact on the economy of the study area.

Adverse effects to visitation and subsequently visitor spending may result from activities associated with human smuggling should people feel unsafe in the Seashore. Border protection protocols have been put in place to help address this issue. A visitor survey has indicated that safety is not a significant concern for Seashore visitors (Scott and Lai 2004), and this would therefore have a negligible impact on local businesses.

Other ongoing activities that would positively contribute to the overall visitor experience and could affect visitor numbers and spending in the area of analysis would include maintenance dredging of the Gulf Intracoastal Waterway and the Mansfield Channel. These areas are dredged on an as needed basis. By boat, visitors can access parts of the Seashore that are not accessible via 4WD vehicle, which may make area more attractive to certain users. Any increase in visitation as a result of such activities would result in economic benefits.

Park programs, such as the Kemp's Ridley Sea Turtle Recovery Program and volunteer clean-ups, are a big draw for visitors. People come to watch the hatchlings swim into the ocean. Economic benefits in the local economy are recognized through visitation and visitor spending associated with these programs. Beach debris and clean-up may contribute to one's overall visitor experience and whether someone returns to the Seashore in the future. Five major and several smaller beach clean-ups are performed annually. Visitation and visitor spending could be beneficially affected by cleaner beaches.

In addition to those actions occurring in and around the Seashore, it is recognized that current and future national economic conditions would affect local and regional economies in a fashion similar to that

experienced by the entire United States. Tourism is also sensitive to the cost of fuel, which has increased in the recent years and hit a peak of more than \$4.00 per gallon during the summer of 2008. A local business association has indicated that over the past two years, visitation to local businesses is down between 30 and 40 percent (LBG 2010). However, local Seashore visitation may increase as people search for more economical vacation opportunities, although local visitor spending contributes considerably less than non-local spending to local economies. Effects of national economic conditions will vary over time; however, those similar to what has been experienced in 2008 and 2009 are expected to have long-term minor to moderate adverse impacts on the study area.

In the long-term, visitation associated with the abovementioned cumulative projects would likely result in sizeable beneficial effects in the Corpus Christi area. However, continued economic stagnation at the national level could cause long-term minor to moderate adverse impacts, with the magnitude dependent on the extent of economic downturn. These effects in combination with long-term beneficial impacts associated with alternative 1 would result in overall long-term beneficial cumulative impacts in the region. The extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **Conclusion**

Under alternative 1, visitors would be able to enjoy the Seashore's resources in the same way as they could prior to the 2009 and 2010 temporary seasonal restrictions were put in place. Social and economic impacts of alternative 1 would be anticipated to continue based on current visitation and economic conditions, providing beneficial impacts on local economies. Cumulative impacts would be long-term beneficial in the region, although the extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **IMPACTS OF ALTERNATIVE 2: SHORTER SEASONAL RESTRICTIONS COMBINED WITH "SAFETY ZONE" MANAGEMENT**

This alternative would include shorter seasonal restrictions combined with "safety zone" management. A seasonal speed limit of 15 mph for the entire beach would begin with the observation of the first Kemp's ridley sea turtle nest or April 15, whichever comes first, and would last until five days after the last Kemp's ridley nest has ever been recorded in Texas, currently in mid-July. Outside of these dates, the speed limit would remain 25 mph from mile marker 2.5 to Mansfield Channel. The speed limit in safety zones of 100 yards within named hazards would also be 15 mph. This would protect people, pets, buildings, turtles, and other wildlife.

Specific user groups could be affected by the proposed actions associated with this alternative. The seasonal reduction in the speed limit would result in longer travel times to points south of mile marker 31. One-way travel times to Big Shell and Mansfield Channel would increase by 30-40 minutes and 1.5 hours, respectively. The longer travel times are likely to primarily affect those Big Shell and Mansfield visitors – possibly making the trip prohibitive for a one-day excursion during the seasonally restricted time period – and reduce the number of visits to these beaches by a small number of visitors.

As mentioned above, the seasonal speed limit would have a duration of approximately three months from mid-April to mid-July. Using monthly and annual visitation numbers from 2009, approximately 48.6 percent of all Seashore visits are between April and July (NPS 2010b, 2010c). As mentioned in alternative 1, it has been estimated that between 2,890 and 15,219 people visited points south of mile marker 31 in 2009 (Scott and Lai 2004; Ditton and Gramann 1987). With the higher visitation estimate (15,219), it is possible that 48.6 percent or 7,396 people visited points south of mile marker 31 between April and July, which represents 1.2 percent of 2009 visitation. Visitors to these down island beaches are primarily from

local communities, including Corpus Christi, and frequent those parts of the Seashore more than once per year (NPS 2010f). However, it is understood that some down island visitors likely would come from locations further away, such as San Antonio, some of whom may also visit more than once per year. Visitors to the Seashore from the local area contribute to local economies less than those that are visiting from outside the region.

Fishing is one of the primary activities enjoyed by Seashore visitors. It has been estimated that a group of 2-3 vehicles having 7-8 passengers purchases between \$100 and \$150 on bait and tackle supplies (LBG 2010). If the down island visitors are from the local area, additional purchases of food, goods, and services from local businesses cannot be directly attributable to the Seashore. Therefore, spending associated with the purchase of such goods and services represents a very small share of visitor spending at the Seashore.

As a result of a seasonal speed limit reduction, some users may elect to travel to other beaches or spend an extra night in the Corpus Christi area or at the Seashore itself. Other area beaches located close to the Seashore include other beaches on North Padre Island and Mustang Island. For some visitors, travel times to these beaches would be shorter than driving to points south of mile marker 30 on the beach at the Seashore. However, fishing and surfing conditions as well as the remoteness of the southern part of the Seashore provides a different experience than found at other nearby beaches. Should some users elect to travel to other nearby beaches, it is anticipated that they would still purchase their goods and services in the local market; therefore negligible adverse effects to local businesses are anticipated.

It is possible that some users may elect to visit a beach farther away or not to take a beach trip as a result of the longer travel time to points down island. In this case, visitor spending associated with these trips may or may not occur at a different location. The three local businesses interviewed, which includes a local business association, indicated that they do not anticipate that visitors frequenting points south of Big Shell would stop doing so because of a reduction in the speed limit (LBG 2010). It is possible that because of the longer travel times and the unique quality of the down island experience that some visitors would extend their stays to the Seashore, therefore, purchase more goods and services in the local economy. This would positively affect visitor spending in the study area.

It is believed that few visitors to points south of Big Shell stay overnight in local hotels (LBG 2010). Some family members may stay at a local hotel while others drive down island, but this represents a very small share of total annual hotel stays (LBG 2010). As a result, hotel stays and spending by hotel guests could increase or decrease slightly should down island visitors decide to travel elsewhere or spend an additional night camping at the Seashore.

Therefore, no discernible change in the economic contribution of visitor spending to local economies is anticipated with the change in management policies under alternative 2. Economic contribution from Seashore visitor spending would continue to provide beneficial effects to the local economy.

## **Cumulative Impacts**

Socioeconomic impacts of the cumulative actions unrelated to Seashore vehicle management under alternative 2 would be the same as those described under alternative 1. In the long-term, visitation associated with the abovementioned cumulative projects would likely result in benefits to the Corpus Christi area. However, continued economic stagnation at the national level could cause long-term minor to moderate adverse impacts. These effects in combination with long-term beneficial impacts associated with alternative 2 would result in overall long-term beneficial cumulative impacts in the region. The extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## Conclusion

Under alternative 2, a seasonal speed limit reduction and safety zones would be implemented. There may be a very slight change in visitation to the Seashore as a result of these policies; however, such a change is not anticipated to result in any discernible change in economic activity – either positive or negative. Current visitation levels provide beneficial impacts on local economies. Cumulative impacts would be long-term beneficial, as it is not anticipated that past, present, and future actions in combination with the alternative 2 would result in any discernible change in visitor patronage to the Seashore than experienced under current conditions. Again, the extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## IMPACTS OF ALTERNATIVE 3: LONGER SEASONAL RESTRICTIONS (PREFERRED ALTERNATIVE)

Under alternative 3, a speed limit of 15 mph for the entire beach would begin on March 1 and continue through Labor Day (early September). This is a longer restriction period than proposed under alternative 2, from three months to six months. Outside of these dates, the speed limit from mile marker 2.5 to the Mansfield Channel would be 25 mph. This alternative would protect resources by encompassing reduced speed limits during the busy visitor use period (March through September). It would also encompass most of the sea turtle nesting and hatching seasons for all turtle species, and most of the spring and fall bird migration periods.

Using monthly and annual visitation numbers from 2009, 78 percent of all Seashore visits are between March and September (NPS 2010b, 2010c). As mentioned in alternative 1, it has been estimated that between 2,890 and 15,219 people visited points south of mile marker 31 in 2009 (Scott and Lai 2004; Ditton and Gramann 1987). With the higher visitation estimate (15,219), it is possible that 78 percent or 11,870 people visited points south of mile marker 31 between March and September, which represents 2 percent of 2009 visitation. As described under alternative 2, the visitors to down island beaches are primarily from local communities and contribute to local economies less than those that are visiting from outside the region. If visitors decide to go to a substitute beach within the greater Corpus Christi region, there would be no anticipated change in visitor spending in the local economy.

It is possible that because of the longer travel times and the unique quality of the down island experience, which includes fishing, at the Seashore, visitors would extend their stays to the Seashore should it take longer to travel down island. However, it is also possible that some users may elect to go to a beach farther away or not to take a beach trip at all as a result of the longer travel time to points down island. Local businesses that were interviewed indicated they do not anticipate that visitors frequenting points south of Big Shell would stop doing so because of a reduction in the speed limit (LBG 2010). Therefore, any change in visitation as a result of the reduced speed limit would be slightly greater than under alternative 2. However, it is anticipated that any change in visitation would be so slight that beneficial effects associated with Seashore visitor spending to local economies under alternative 2 would remain unchanged.

## Cumulative Impacts

Socioeconomic impacts of the cumulative actions unrelated to Seashore vehicle management under alternative 3 would be the same as those described under alternative 1. In the long-term, visitation associated with the abovementioned cumulative projects would likely result in benefits to the Corpus Christi area. However, continued economic stagnation at the national level could cause long-term minor to moderate adverse impacts. These effects in combination with long-term beneficial impacts associated

with alternative 3 would result in long-term beneficial cumulative impacts in the region. The extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **Conclusion**

Under alternative 3, a speed limit of 15 mph for the entire beach would begin on March 1 and continue through Labor Day (early September). This is a longer restriction period than proposed under alternative 2 – from three months to six months. There may be a slight decrease in visitation to the Seashore, relative to alternative 2, as a result of these policies; however, such a change is not anticipated to result in any discernible change in economic activity. Current visitation levels provide beneficial impacts on local economies. Cumulative impacts would be long-term beneficial, as it is not anticipated that past, present, and future actions in combination with the alternative 3 would result in any discernible change in visitor patronage to the Seashore than experienced under current conditions. Again, the extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **IMPACTS OF ALTERNATIVE 4: YEAR-ROUND RESTRICTIONS**

Alternative 4 would implement a 15 mph speed limit for the entire beach year-round. This alternative would protect all resources year-round by limiting the speed limit along the entire beach to 15 mph, which is also consistent with the speed limit on state beaches.

Between 2,890 and 15,219 people visited points south of mile marker 31 in 2009 (Scott and Lai 2004; Ditton and Gramann 1987). These figures represent between 0.5 and 2.5 percent of 2009 visitation. As described under alternative 2, the visitors to down island beaches are primarily from local communities and contribute to local economies less than those that are visiting from outside the region. If visitors decide to go to a substitute beach within the greater Corpus Christi region, there would be no anticipated change in visitor spending in the local economy.

It is possible that because of the longer travel times and the unique quality of the down island experience, which includes fishing, at the Seashore, visitors would extend their stays to the Seashore should it take longer to travel down island. However, it is also possible that some users may elect to go to a beach farther away or not to take a beach trip at all as a result of the longer travel time to points down island. Local businesses that were interviewed indicated they do not anticipate that visitors frequenting points south of Big Shell would stop doing so because of a reduction in the speed limit (LBG 2010). Therefore, any change in visitation as a result of the reduced speed limit would be slightly greater than under alternatives 2 and 3. However, it is anticipated that any change in visitation would be so slight that beneficial effects associated with Seashore visitor spending to local economies under alternatives 2 and 3 would remain unchanged.

## **Cumulative Impacts**

Socioeconomic impacts of the cumulative actions unrelated to Seashore vehicle management under alternative 4 would be the same as described those under alternative 1. In the long-term, visitation associated with the abovementioned cumulative projects would likely result in benefits to the Corpus Christi area. However, continued economic stagnation at the national level could cause long-term minor to moderate adverse impacts. These effects in combination with long-term beneficial impacts associated with alternative 4 would result in long-term beneficial cumulative impacts in the region. The extent to which these impacts are experienced may in large part be attributable to national economic conditions.



## **Conclusion**

Alternative 4 would implement a 15 mph speed limit for the entire beach year-round. This alternative would protect all resources year-round by limiting the speed limit along the entire beach to 15 mph, which is also consistent with the speed limit on state beaches. There may be some change in visitation to the Seashore as a result of the year-round decrease in the beach speed limit; however, such a change is not anticipated to result in any discernible change in economic activity – either positive or negative. Current visitation levels provide beneficial impacts on local economies. Cumulative impacts would be long-term beneficial, as it is not anticipated that past, present, and future actions in combination with the alternative 4 would result in any discernible change in visitor patronage to the Seashore than experienced under current conditions. Again, the extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **IMPACTS OF ALTERNATIVE 5: CITIZENS FOR ACCESS AND CONSERVATION ALTERNATIVE, OPTIONS A AND B**

Under alternative 5, the speed limit would be a continuation of the management policies prior to the temporary seasonal restrictions implemented in 2009 and 2010. Similar to alternative 1, the speed limit would continue to be 15 mph on North Beach and from mile marker 0 to 2.5 on South Beach. Once beach drivers are beyond the 2.5 mile marker, the speed limit would be 25 mph until visitors reached Mansfield Channel. The beach would continue to be closed during high tide and storm events. Similar to alternative 2, alternative 5 would implement a safety zone year-round. The safety zone would require beach drivers to reduce their speed to 15 mph within 100 feet of a person not in a vehicle, pet, parked vehicle, or a structure under Option A; Option B adds wildlife to that list.

Alternative 5 would not result in additional driving time for visitors wishing to travel to any point down island other than the additional time spent slowing down for safety zone triggers along the way. Under alternative 5, it is anticipated that the current level of visitation and visitor spending would continue providing both short- and long-term socioeconomic benefits experienced by local tourism-based businesses. Economic benefits under this alternative would be the same as under alternative 1.

## **Cumulative Impacts**

Socioeconomic impacts of the cumulative actions would be the same as those described under alternative 1. In the long-term, visitation associated with the abovementioned cumulative projects would likely result in benefits to the Corpus Christi area. However, continued economic stagnation at the national level could cause long-term minor to moderate adverse impacts. These effects in combination with long-term beneficial impacts associated with alternative 5 would result in long-term beneficial cumulative impacts in the region. The extent to which these impacts are experienced may in large part be attributable to national economic conditions.

## **Conclusion**

Under alternative 5, social and economic impacts are anticipated to continue based on current visitation and economic conditions, providing long-term beneficial impacts on local economies. Cumulative impacts would be long-term beneficial. Again, the extent to which these impacts are experienced may in large part be attributable to national economic conditions.

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## **CHAPTER 5: CONSULTATION AND COORDINATION**

The intent of NEPA is to encourage the participation of federal- and state-involved agencies and affected citizens in the assessment procedure, as appropriate. This chapter describes the consultation that occurred during development of this EA. This chapter also includes a description of the public involvement process and a list of the recipients of the document.

### **THE SCOPING PROCESS**

As described in chapter 1, the NPS divides the scoping process into two parts: internal scoping and external or public scoping. Internal scoping involved discussions among NPS personnel regarding the purpose of and need for management actions, issues, management alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, available references and guidance, and other related topics. Public scoping is the early involvement of the interested and affected public in the environmental analysis process. The public scoping process helps ensure that people have an opportunity to comment and contribute early in the decision-making process. For this planning document, project information was distributed to individuals, agencies, and organizations early in the scoping process, and people were given opportunities to express concerns or views and to identify important issues or even other alternatives. Taken together, internal and public scoping are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this EA.

#### **INTERNAL SCOPING**

An internal scoping was held on May 18-19, 2010 with involved Seashore personnel to define the purpose and need for the project, identify objectives, review potential issues and impact topics, gather information on potential impacts, and identify preliminary alternatives. Agency consultation was discussed. Consultation with the USFWS will be conducted because federally listed threatened and endangered species are present in the study area. Consultation will also be conducted with the Texas Historic Commission and Tonkawa Tribe to ensure that listed or eligible historic properties and cultural resources are not adversely affected. Agency consultation letters can be found in appendix B.

#### **PUBLIC SCOPING**

The NPS initiated public scoping for the Beach Vehicle EA by issuing a scoping brochure on July 23, 2010. The brochure was sent to a mailing list consisting of 502 recipients and was posted to the Seashore's PEPC website. The brochure described the EA process and the preliminary purpose, need, objectives, and alternatives that were developed by the Seashore during internal scoping. In accordance with NEPA and Director's Order 12, the issuance of the scoping brochure began the at minimum 30-day requirement for public comment. The public scoping comment period began on July 23, 2010, and was subsequently extended to September 29, 2010, to allow for additional comment and accommodate a public meeting. On September 14, 2010, a public meeting describing draft project alternatives was held in Corpus Christi, Texas at the Harte Research Institute from 6:00 pm to 9:00 pm. A meeting notice was published in a local paper and a public notice was posted on the Seashore's website. Seventy-five people signed in to the meeting.

The NPS provided several methods for the community to provide input on the proposed project during the public comment period. Comment sheets were provided at the public meeting. Those attending the meetings were also given a brochure providing additional opportunities for comment on the project including directing comments to the NPS PEPC website at <http://parkplanning.nps.gov/pais/>.

## **Public Scoping Comments**

During the comment period, 154 pieces of correspondence were received, containing a total of 387 comments. Comments received were very diverse and represented a wide range of views. A large percentage of commenters (about 18 percent) offered ideas for new alternatives or alternative elements. Other comments posed by a relatively large percentage of commenters included questions on the scientific data used and NEPA issues.

Commenters both supported and opposed the preliminary alternatives that included seasonal reductions in speed. Many commenters supported the no action alternative (retain 25 mph speed limit), but a relatively large number supported year-round reduced speeds or longer seasonal restrictions. Concern was expressed that the reduced speed would result in a lack of beach access. It was also suggested that the Seashore should ban beach driving altogether. Several concerns centered on safety and whether there is a need to reduce speeds given the safety record, while others were concerned about the effects of higher speeds on the safety of Seashore turtle patrollers and visitors. Questions and concerns were raised about the turtle program, potential beach closures, the NEPA process and possible segmentation of issues under NEPA, the range of alternatives considered, data availability and sufficiency, effects on listed species, effects on visitation and local socioeconomics, enforcement, safety zone distances proposed, and timing for seasonal reduced speeds.

Many commenters offered suggestions for different alternatives or elements, and several supported the alternative that had been brought forth by the CAC. As a result, this alternative was included for full analysis in this EA.

## **AGENCY CONSULTATION**

In accordance with Section 5.5 of Director's Order 12, coordination and public involvement in the planning and preliminary design of the proposed action was initiated early in the process. As required by NPS policies and planning documents, it is the Seashore's objective to work with state, federal, and local governments and private organization to ensure that the Seashore and its programs are coordinated with theirs, are supportive of their objectives, and that their programs are similarly supportive of Seashore programs. The following agencies were consulted when preparing this EA:

### **Federal Departments and Agencies**

- U.S. Department of the Interior, U.S. Fish and Wildlife Service

### **Texas State Agencies**

- Texas Parks and Wildlife Department
- State Historic Preservation Office, Texas

### **Affiliated Native American Groups**

- Tonkawa Tribe

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## LIST OF RECIPIENTS

To inform the public of the availability of the EA, the NPS will publish and distribute a press release and distribute a notification letter to the various agencies, tribes, and members of the public on the project mailing and e-mail lists. The EA will also be available electronically on the NPS PEPC website at

<http://www.parkplanning.nps.gov/pais>. Copies of the document will also be available for review at the Seashore's visitor center and will be provided to interested parties upon request.

The EA is subject to a minimum 30-day public comment period. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment, as needed.

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## APPENDIX A: IMPAIRMENT DETERMINATION

### THE PROHIBITION ON IMPAIRMENT OF PARK RESOURCES AND VALUES

The National Park Service (NPS) *Management Policies 2006*, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

### WHAT IS IMPAIRMENT?

NPS *Management Policies 2006*, Section 1.4.5, “What Constitutes Impairment of Park Resources and Values,” and Section 1.4.6, “What Constitutes Park Resources and Values,” provide an explanation of impairment.

...impairment...is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Section 1.4.5 of NPS *Management Policies 2006* states:

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park’s general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per Section 1.4.6 of NPS *Management Policies 2006*, park resources and values that may be impaired include

- the park’s scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the



- ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
  - the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
  - any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park, but this would not be a violation of the *Organic Act* unless the NPS was in some way responsible for the action.

## HOW IS AN IMPAIRMENT DETERMINATION MADE?

Section 1.4.7 of *NPS Management Policies 2006* states:

In making a determination of whether there would be an impairment, an NPS decision-maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under section 106 of the National Historic Preservation Act (NHPA), relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision.

*NPS Management Policies 2006* further define “professional judgment” as “a decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker’s education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relating to the decision.”

## IMPAIRMENT DETERMINATION FOR THE PREFERRED ALTERNATIVE

This determination on impairment has been prepared for alternative 3 described in chapter 2 of this environmental assessment (EA). An impairment determination is made for all resource impact topics analyzed for alternative 3. An impairment determination is not made for visitor and employee safety, visitor use and experience, Seashore operations and management, or socioeconomics because impairment findings relate back to park resources and values, and these impact areas are not generally considered to

be a park resource or value according to the *Organic Act*, and cannot be impaired in the same way that an action can impair park resources and values.

The NPS has determined that the implementation of the NPS alternative 3 would not constitute an impairment to the resources or values of the Padre Island National Seashore. This conclusion is based on consideration of the thorough analysis of the environmental impacts described in the EA, relevant scientific studies, the comments provided by the public and others, and the professional judgment of the decision-maker guided by the direction in *NPS Management Policies 2006*. Implementation of the NPS selected alternative would not result in impairment of park resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the park's establishing legislation, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified in the park's management plan or other relevant NPS planning documents as being of significance.

## **FINDINGS ON IMPAIRMENT FOR THE BEACH VEHICLE ENVIRONMENTAL ASSESSMENT AT PADRE ISLAND NATIONAL SEASHORE**

### **WILDLIFE**

Implementation of alternative 3 would not result in impairment to wildlife as sufficient population numbers and functional habitat would remain to maintain sustainable populations of mammals, invertebrates and other bird species in the Seashore.

Mammals are not commonly found on the Gulf beach because suitable habitat and fresh water are scarce there; however rodents and coyotes visit the beach while foraging, and deer have been documented on the beach side of the dune line. Typically two to three accidents a year are reported where deer or coyotes have been hit by vehicles on the beach and others may go unreported. Accidents resulting in injury or mortality of mammals would be expected to continue even with a 15 mph speed limit for 6 months of the year, but the slower speed would allow drivers more time to slow down, change course, or stop to avoid the more readily visible and mobile mammals. At the slower speed limit under alternative 3 vehicles would still be expected to temporarily displace mammals upon approach, but the animals would be able to readily return to their pre-disturbance behavior once the vehicle passed. Due to the relatively few vehicle accidents with mammals that currently exist and the slight benefits that driving at a slower speed would provide, the EA analysis deemed the adverse impacts on mammals from the implementation of alternative 3 to be negligible to minor.

The Seashore's Gulf beach ecosystem is home to a vast quantity of invertebrates, which form a valuable link in the coastal food chain and provide a vital food source for birds, particularly migrating birds that need to store up energy reserves before continuing their spring or fall migration. Vehicle use on the beach has adverse impacts on invertebrate species and populations due to mortality of individuals by crushing, rutting, and compaction under vehicle tires. Access to the intertidal zone often requires vehicles to cross over the *Sargassum* wrack line, crushing, scattering, or burying invertebrates. Speed is not a major factor in vehicle impacts on invertebrates, so reducing the speed limit to 15 mph for six months of the year under alternative 3 would not provide much protection to invertebrates. However, given the size of the Gulf beach habitat (65 miles long), the large amount of *Sargassum* on the beach, and the fact that over 50 percent of vehicle use on the beach is confined to the northern 10 miles of South Beach, the EA analysis deemed the adverse impacts from alternative 3 on invertebrates to be minor.

Over 380 species of migratory and resident birds have been documented as occurring within the Seashore including shorebirds, waterfowl, neo-tropical songbirds and raptors. The Seashore lies along the Central

Flyway, a migratory path for birds as they travel from North America to the Gulf Coast, Mexico, Caribbean and for some species as far south as Argentina and Chile. Its range of habitats makes the Seashore an essential stopover point for migrating and resident birds seeking areas for rest, food, nesting and breeding, and many birds winter on the island as well. Birds on the Seashore's Gulf beach are found either resting or foraging. Vehicle impacts on birds on the beach can result in mortality from birds being run over and from colliding with vehicles. They can also flush birds, thereby keeping them from foraging and resting within their preferred habitats and expending energy stores needed for their migration. Flushing of birds is primarily caused by their presence and their distance of approach rather than their speed. If speed contributes to the impact at all, a faster speed may cause a bird to flush sooner and stay in flight slightly longer; however, it is not expected that their response would be substantially different for 15 mph than for 25 mph. Additionally, the risk of vehicles colliding with birds would likely be similar between 15 mph and 25 mph since collisions are rare events at any speed due to the bird's flushing behavior. The EA analysis deemed these adverse impacts, along with the impacts on invertebrates (i.e., bird forage species) to have a negligible to minor impact on birds.

Overall, the EA analysis deemed the adverse impacts on wildlife from the implementation of alternative 3 to be negligible to minor, because, although occasional disturbance and harm to wildlife or their habitat would occur, it would not be outside the level of disturbance or harm that would occur naturally and the Seashore would maintain sustainable populations of mammals, invertebrates and birds species.

Cumulative impacts from combining the effects of alternative 3 with effects of other past, present and future planned actions in the Seashore would likely result in disturbance, injury, and/or mortality of some wildlife species. Even with these adverse effects, population numbers and functional habitat would remain to maintain sustainable populations in the Seashore. Therefore, impacts on wildlife would not result in impairment to these species.

## **SPECIAL-STATUS SPECIES**

Implementation of alternative 3 would not result in impairment to special status species as sufficient population numbers and functional habitat would remain to maintain sustainable populations of federal and state listed species.

Federal and state listed species analyzed in the EA occurring on the Seashore's Gulf beach include five species of sea turtles that nest on the beach (Kemp's ridley, green, hawksbill, loggerhead, and leatherback sea turtles) and several species of birds: eastern brown pelican, reddish egret, white-faced ibis, sooty tern, and the piping plover. At the Seashore, the Kemp's ridley sea turtle nesting population has increased since 2000 from 5 nests to 74 nests in 2010 with a peak of 117 nests in 2009, and population models predict the world wide population to continue to grow at an estimated 12 to 16 percent annually. The other four species of sea turtles are rare nesters at the Seashore, though green sea turtles, along with Kemp's ridley sea turtles, commonly strand at the Seashore. The listed bird species can be found resting or foraging on the beach.

Kemp's ridley sea turtles are small, often become covered in sand when nesting and their color blends in with vegetation and sand. By reducing the speed limit from 25 mph to 15 mph, this provides a shorter vehicle stopping distance and a greater likelihood that vehicle operators could avoid directly impacting nesting or stranded sea turtles as well as hatchlings emerging from an undetected nest. Requiring vehicles to travel at 15 mph would also prevent visitors from necessarily passing turtle patrollers and possibly directly impacting turtles on the beach or running over and obliterating crawl tracks prior to turtle patrollers finding them, enhancing the ability of the patrollers to find and protect nests. By restricting vehicle speeds to 15 mph from March 1 through Labor Day, the protective measures of a slower speed limit would encompass all of the Kemp's ridley nesting and hatching season and most of the nesting and

hatching seasons for the other four species of sea turtles that nest at the Seashore. The EA analysis deemed the impacts from a reduction in vehicle speed under alternative 3 to be wholly beneficial for sea turtles occurring on the Seashore, allowing sufficient population numbers and functional habitat to exist and maintain a sustainable population in the Seashore.

The analysis in the EA of cumulative impacts combined with the effects of alternative 3 with effects of other past, present and future planned actions in the Seashore, including the sea turtle rescue program, and deemed the cumulative impacts to be beneficial. Therefore, the impacts on federal and state listed sea turtles would not result in impairment.

As discussed under “Wildlife” above, vehicle speed is not believed to substantially contribute to the overall adverse impact on birds from vehicles. Flushing of birds by vehicles is due more to the presence and distance of encroachment of a vehicle than its speed of approach. Collisions of birds with vehicles are rare at any speed, and would likely not be dissimilar between 25 mph and 15 mph, though they may be slightly reduced at the slower speed. The EA analysis deemed the impacts from restricting the speed limit under alternative 3 as negligible to minor for federal and state listed bird species on the Seashore’s Gulf beach.

The analysis in the EA of cumulative impacts combined the effects of alternative 3 with effects of other past, present and future planned actions in the Seashore. The cumulative impacts were deemed to be minor adverse because impacts on federal and state listed bird species and their habitats would be barely perceptible and sufficient habitat would remain functional to maintain a sustainable population in the Seashore. Therefore, the impacts on federal and state listed bird species would not result in impairment.

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## APPENDIX B: SOCIOECONOMIC LITERATURE REVIEW

### SOCIOECONOMIC LITERATURE REVIEW

A literature review was conducted to ensure that this document adequately and appropriately considers how existing social and economic conditions may be affected by proposed project alternatives. The following presents a summary of those reports considered the most applicable to this project.

#### SOCIAL EFFECTS TO USERS OF PADRE ISLAND NATIONAL SEASHORE RESOURCES

The change in management of beach driving at the Seashore could have social implications for certain user groups, which could affect the quality of life enjoyed by certain visitors. The following reports were reviewed in an attempt to fully understand how such a change could result in social impacts on certain users.

***Situation Assessment Report: Padre Island National Seashore Management Issues and Potential Approaches to Resolution (CDR Associates 2009).*** This report was prepared by an independent third party so recommendations would be impartial; the study was done to evaluate conflicting views of management policies for the Seashore. The goal of the study was to identify and explore issues of Padre Island National Seashore management with a diverse group of current resource users and to develop suggestions for procedures identifying possible ways to address and resolve concerns. Twenty-six individuals or groups who had registered a complaint with the National Park Service (NPS) or others who were concerned with issues associated with the Seashore were interviewed. Interviewed parties included: the Seashore leaders of fishing, recreation, and conservation organizations, including the Citizens for Access and Conservation (CAC); staff of the state of Texas; and NPS staff at the Regional Office; among others.

The following identifies just a few of the main points with which all interviewees agreed to varying extents:

- Protection and recovery of the Kemp's ridley sea turtle, nesting, and nesting habitat are critical for preserving multiple uses in the Seashore
- Management of vehicle traffic is important to consider as one means to protect both the endangered turtles and assure public safety
- The fishing community is an important user and constituency of the Seashore, and their interests need to be solicited and considered when making decisions about Seashore management
- Efforts should be made to preserve and enhance fishing at the Seashore
- More communication is needed by the Seashore with the public and more opportunities for public involvement should be implemented.

CAC has specifically criticized the current management at the Seashore with respect to poor public engagement and that such lack of communication has made visitors not want to return.

The report highlights several subject areas where there are conflicting ideas about how best to approach the issue at hand. For purposes of this assessment, the following will identify those specific to beach driving and management policies. The following identifies just a few of the issues that have or will be discussed between NPS officials and concerned stakeholders.

- What role might regulation of speed limits play at critical periods of the year when the turtles are nesting?
- Are there ways to assure the protection of sea turtles from vehicle traffic and at the same time allow speed limits above 15 mph on the whole or designated section of the beach? Are there possibilities of having different speed limits for different times of the day, based on weather, surf or sand conditions? Could specific zones on the beach be checked and “cleared” by turtle patrols so that higher driving speeds could be allowed?
- What considerations should go into setting speed limits in areas on the beach up to mile marker 5 or further down the beach, which are often congested with people? What can or should be done to assure their safety?
- What measures should be taken on other stretches of beaches, i.e., beyond marker 5 to assure that rapidly moving vehicles do not pose safety risks to stationary beachgoers.

***A Survey of Down-Island Visitors and Their Use Patterns at Padre Island National Seashore (Ditton and Gramann 1987).*** Visitor information was obtained through a series of interviews and surveys conducted in 1985; however, the report itself was not released until 1987. While somewhat dated, the information presented in the report shows visitor use patterns and resources and activities of particular importance to user groups and is therefore still relevant today. A self-administered questionnaire was sent to 517 beach users and 198 fishermen to better understand trip motives and satisfactions, perceptions and reactions to environmental conditions, patterns of down island use, and user evaluation of management policies. Both user groups had a response rate of around 70 percent.

Of those who completed the questionnaire, the majority of beach users were from Texas with about 16 percent of this group being from Nueces, Kleberg, or San Patricio Counties. Similarly, the majority of fishermen were also from Texas. However, almost half of those from Texas resided within one of the abovementioned counties. Almost half of the fishermen had been frequenting the Seashore for more than ten years as compared to one-third of beach users.

More than half of those interviewed at the Seashore did not travel more than four miles of the paved road. Approximately 70 percent of visitors stated that their destination was the beach area north of the 4WD sign. While beach users tend to stay in this part of the Seashore, fishermen were more likely to travel to the Yarbrough Pass and points south. Almost 18 percent of visitors travel to Little Shell Beach, however, individual destinations south of there do not display high visitation. Local residents are more likely to travel south past the 4-wheel drive sign than non-local users. There are more overnight stays and fewer day trips to the southern beaches.

When asked about management policies to protect the Kemp’s ridley sea turtle, the vast majority of fishermen stated that they would prefer the use of a beach patrol to find and remove sea turtle eggs than the closure of the beach itself. Almost half of beach users were somewhat or very much in favor of closing beaches to vehicles from May through August if it protected nesting sea turtles. Only 17 percent of fishermen are in favor of such policies. As a whole, fishermen were more favorable than beach users in their reaction to cut back visitor services in order to pay for a turtle patrol program.

***Shoreline Management at Padre Island National Seashore: An Investigation of Angler Relationships to the Beach (Aldrich 2009).*** The purpose of this graduate school thesis was to better understand angler relationships to the Seashore and the NPS to inform policy decisions and to help minimize and manage conflict. Interviews, a literature review, and other background research were conducted as part of this thesis.

Anglers who visit the Seashore describe it as a place a multi-faceted uniqueness that is incomparable to other nearby beaches. Additionally, the ability to drive on the beach is a large contributing factor to the remote beach experience. Anglers have expressed concern that a change in management policies would disturb their existing practices. Anglers have argued that they have been using the Seashore since before it became designated as a park unit and should therefore be able to maintain their practices. It has also been suggested that some anglers are opposed to management policies because they are resistant to federal ownership of Texas lands. However, anglers are very protective of the Seashore and therefore often question management policies of the governing entity (the NPS).

Twenty anglers were interviewed for this report. Many of the interviewed anglers are engaged in activities to educate the public on appropriate conservation efforts and sustainable fishing practices. They often times regulate their own fishing behavior and have developed conservation practices of their own to protect the beach. Other subjects that are of concern to anglers include safety, increased visitation and other types of visitors, and lack of communication. The concern over increased visitation stems from anglers observation that the high beach section has eroded and dropped in height over the years. They are unsure if this is because of beach driving or storms but they are interested in working with the scientific community to address these concerns. Second, many anglers consider themselves as protectors of the beach and become frustrated when NPS fails to leverage them as equal partners and protectors of the environment.

In terms of safety, anglers support NPS law enforcement patrolling at night, partnering with other law enforcement agencies to help cover and patrol the beach, and keeping the public aware of safety incidents on the beach, and how NPS is dealing with such events. Anglers have expressed concern that people drive too fast and irresponsibly near camps and families.

Anglers enjoy driving on the beach because it provides access to fishing locations far from crowds. Some indicated that driving on the beach is a freedom and a luxury not possible on all beaches. They are concerned about the protection of the Kemp's ridley sea turtle; however, they also fear that increasing numbers of sea turtles may ultimately lead to the end of beach driving as priorities could shift to greater protections for the turtles.

## **ECONOMIC CONTRIBUTIONS TO LOCAL ECONOMIES**

Various reports were reviewed to summarize the role of Padre Island National Seashore visitor spending on the larger region. The reports summarized below represent some of the most detailed reports on spending patterns by those visiting the Seashore and Corpus Christi.

***2008 National Park Visitor Spending and Payroll Impacts Report (Stynes 2009).*** This report – prepared by Daniel Stynes from Michigan State University – provides estimates of NPS visitor spending for 2008 in addition to estimates of economic impacts associated with visitor and NPS employee spending on local economies. Visitor spending is presented for local and non-local visitors. Non-local visitors are those

travelling 50 miles or more to enjoy the resource<sup>1</sup>. Economic impacts are only estimated for non-local visitor spending.

The report estimates 635,925 visitors to Padre Island National Seashore in 2008 and total visitor spending to be approximately \$43,838,000. The report attributes 95.2 percent of visitor spending or \$41,735,000 to be generated by non-local visitors. There were 57,312 overnight stays in the Corpus Christi area as a result of people visiting the Seashore.

Stynes estimates that 839 jobs in the Corpus Christi area are directly attributable to non-local visitor spending and an additional 91 jobs are sustained by spending from the 65 NPS employees at Padre Island National Seashore. One job is supported for every \$49,743.74 in non-local visitor spending.

***The Economic Significance of Tourism and Nature Tourism in Corpus Christi (Lee 2009).*** The report is based on data through 2008 and quantitatively estimates the extent to which Corpus Christi visitors contribute to the region's economic activity, household income, and employment. Corpus Christi is the sixth most popular tourist destination in Texas with more than 7.2 million visitors in 2008. The average size party was 2.3 people. Texas residents represent more than 80.0 percent of this visitation. These visitors spent more than \$1 billion in the local economies on goods and services such as dining, lodging, local transportation, shopping, and recreation and entertainment. Estimated daily spending per person was \$110.70.

Non-local visitor spending directly affects the core tourism industries<sup>2</sup>. Employment in these industries (12,999 employees) represents approximately 7 percent of the Corpus Christi workforce. The non-local spending supports \$275.6 million in wages and salaries, \$514.4 million in value added in the core tourism industries. Approximately \$23.2 million in local taxes and \$59.7 million in state taxes were attributable to tourism and visitor spending in the Corpus Christi Metropolitan Statistical Area. Total economic contribution associated with non-local visitation spending, including ripple or multiplier effects supported \$1.2 billion in value added, \$457.5 million in wages and salaries, and 21,737 jobs.

There are a number of reasons people visit the Corpus Christi area for its attractions, including nature activities, outdoor sports, touring, culture, and other attractions. Nature tourism includes visits to beaches and state and national parks, and hunting, fishing, camping, hiking, and bird-watching, among others. Nature tourism accounts for the largest proportion of visitation to the Corpus Christi region, accounting for approximately 40 percent of visitor trips. Total economic impacts generated by those enjoying nature tourism were \$668.4 million in sales, \$371.7 million in value added, and 8,748 jobs.

## BEACH RECREATION VALUES

***Valuing Beach Closures on the Padre Island National Seashore (Parsons et al. 2009).*** This study estimates the economic loss due to hypothetical beach closures on Padre Island National Seashore. The authors utilize a travel-cost random-utility maximization models, utilizing beach trips data from 884 Texas residents living within 200 miles of the Gulf Coast. The authors analyzed day-use beach visitation for 65 Gulf Coast beaches, six of which are part of the Seashore. The model simulates the closure of all beaches at the Seashore during the five-month peak season, the three northern-most beaches, and the three

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<sup>1</sup> The 50-mile radius is a general average representing the primary impact region around most parks. The radius is closer to 30 miles in urban settings and as large as 100 miles for some western parks.

<sup>2</sup> Core tourism industries include restaurants and bars, hotels/motels, amusements, and retail trade.



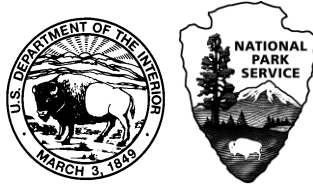
southern-most beaches. The survey of 884 residents indicated that a total of 2,692 trips were taken to these beaches over the five-month spring and summer period. Ten percent of these trips were to the Seashore, and the three northernmost beaches accounted for 95 percent of the 269 visits to the Seashore. Two models were utilized to estimate welfare losses from beach closures: multinomial logit and mixed local models. Total welfare losses were estimated to be approximately \$70 million for the closure of the six Seashore beaches. Closing the three northernmost beaches caused a welfare loss of \$18.6 million, while closing the lower three beaches at the Seashore caused a welfare loss of \$1.0 million. It is important to note that these consumer surplus welfare estimates measure the value of beaches to users above and beyond what they pay (i.e., hotels, access fees, gas costs, food and beverage, etc.) to recreate there.

**TABLE B-1. NUECES COUNTY AND CORPUS CHRISTI METROPOLITAN STATISTICAL AREA (MSA) EMPLOYMENT BY INDUSTRY, 2001 AND 2008**

Industry	Nueces County					Corpus Christi MSA				
	2001		2008		% Change (2001-2008)	2001		2008		% Change (2001-2008)
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
Agriculture, forestry, fishing, and related activities	1,587	0.9%	1,469	0.7%	-7.4%	3,831	1.8%	3,307	1.3%	-13.7%
Mining	3,615	2.0%	6,768	3.2%	87.2%	4,213	2.0%	7,980	3.2%	89.4%
Utilities	820	0.4%	757	0.4%	-7.7%	975	0.5%	891 E	0.4%	-8.6%
Construction	16,303	8.9%	20,223	9.7%	24.0%	18,860	8.8%	25,049	10.2%	32.8%
Manufacturing	10,274	5.6%	9,594	4.6%	-6.6%	13,319	6.2%	11,939	4.8%	-10.4%
Wholesale Trade	5,386	2.9%	6,414	3.1%	19.1%	5,808	2.7%	6808 E	2.8%	17.2%
Retail Trade	19,651	10.8%	22,374	10.7%	13.9%	23,290	10.9%	26,695	10.8%	14.6%
Transportation and warehousing	5,175	2.8%	5,751	2.8%	11.1%	5,973	2.8%	6,599	2.7%	10.5%
Information	3,560	1.9%	2,708	1.3%	-23.9%	3,731	1.7%	3,003	1.2%	-19.5%
FIRE	12,713	7.0%	16,847	8.1%	32.5%	14,681	6.9%	19,891	8.1%	35.5%
Professional, scientific, and technical services	8,050	4.4%	9,899	4.7%	23.0%	8775 E	4.1%	11,495	4.7%	31.0%
Management of companies and enterprises	257	0.1%	684	0.3%	166.1%	288 E	0.1%	755 E	0.3%	162.2%
Administrative and waste services	12,084	6.6%	13,264	6.3%	9.8%	13,470	6.3%	14363 E	5.8%	6.6%
Educational services	1,650	0.9%	1,916	0.9%	16.1%	1706 E	0.8%	2075 E	0.8%	21.6%
Health care and social assistance	23,067	12.6%	26,815	12.8%	16.2%	23557 E	11.0%	28473 E	11.5%	20.9%
Arts, entertainment, and recreation	2,435	1.3%	3,003	1.4%	23.3%	2,899	1.4%	3,624	1.5%	25.0%
Accommodation and food services	15,186	8.3%	17,226	8.2%	13.4%	17,557	8.2%	20,544	8.3%	17.0%
Other services (except public administration)	11,245	6.2%	11,864	5.7%	5.5%	13,278	6.2%	14,243	5.8%	7.3%
Government and government enterprises	29,695	16.2%	31,323	15.0%	5.5%	38,009	17.7%	38,803	15.7%	2.1%
TOTAL	182,753		208,899		14.3%	214,220*		246,537*		15.1%

Note: \*The E in certain industries represents the estimate of the major portion of the true estimate. Since they are estimates, all employment for the MSA is not captured in these figures. Total Corpus Christi MSA employment in 2001 was 216,682 and 247,857 in 2008.

Source: U.S. Department of Commerce, Bureau of Economic Analysis 2010c.



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.