National Park Service
U.S. Department of the Interior

ENVIRONMENTAL ASSESSMENT

Wabash Avenue / Porter Access Site
Indiana Dunes National Lakeshore

July 2013

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CHAPTER 1. INTRODUCTION

The National Park Service (NPS) at Indiana Dunes National Lakeshore (national lakeshore) proposes to address traffic, access, resource, aesthetic, and safety problems at the Wabash Avenue/Porter Access Site. This environmental assessment (EA) analyzes the proposed action alternatives and their impacts on the environment. It has been prepared in accordance with the National Environmental Policy Act of 1969, the regulations of the Council on Environmental Quality (40 CFR 1508.9), and NPS Director's Order #12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision-making*.

The proposed project would address vehicle and pedestrian circulation problems, lack of access to the beach and restrooms that is compliant with the Americans with Disabilities Act of 1990 (ADA), lack of accessible picnic area, inadequately designed parking lots, maintenance and safety issues, and resource damage.

1.1 DESCRIPTION OF THE NATIONAL LAKESHORE

The national lakeshore is located in northern Indiana along the south shore of Lake Michigan, between Gary and Michigan City, Indiana, approximately 50 miles southeast of Chicago (Map 1). It is loosely bounded by Lake Michigan to the north and U.S. 20 to the south (Map 2) and is divided into an East Unit and a West Unit, with several small noncontiguous satellite areas. A variety of residential, commercial, and industrial developments are adjacent to the boundaries, including several small communities that are completely surrounded by national lakeshore land (NPS 1997a).

The national lakeshore was established by the U.S. Congress as a unit of the national park system on November 5, 1966, in order to "preserve for the educational, inspirational, and recreational use of the public certain portions of the Indiana Dunes and other areas of scenic, scientific, and historic interest and recreational value in the State of Indiana."

Today, the national lakeshore totals 15,067 acres and receives nearly two million visitors each year. It offers many amenities such as hiking, biking, and horseback riding trails; camping; beach access; visitor centers; picnic tables and shelters; and interpretive programs. In addition, the national lakeshore is home to four National Natural Landmarks and one National Historic Landmark.

The national lakeshore is comprised of dunes, oak savannas, swamps, bogs, marshes, prairies, rivers, and forests that support a great diversity of plant and animal species. Almost 1,200 native plant species are distributed throughout the national lakeshore, and over 300 bird species have been observed within its boundaries. There are 292 rare species in the park, 235 plants and 57 animals.

MAP 1. REGIONAL LOCATION OF INDIANA DUNES NATIONAL LAKESHORE

MAP 2. INDIANA DUNES NATIONAL LAKESHORE
(WITH PROJECT AREA IDENTIFIED)

1.2 DESCRIPTION OF THE PROJECT AREA

The roughly 15-acre project area is bounded by Indiana Dunes State Park (state park) to the east, Lake Michigan to the north, Wabash Avenue to the west, and an east-west boundary just south of the south NPS parking lot (Map 3). This east-west boundary, from Wabash Avenue to the state park, has been identified specifically for this project, and any NPS land south of this east-west line has been excluded due to steep slopes. The site has undulating topography, due to extensive dune formations, with dunes over 100 feet tall in the eastern section and south of the project area.

The national lakeshore was established after the region had been politically developed. Therefore, all areas within the national lakeshore lie within the political boundaries of a town, city, or county. Each of these local governments owns land within the national lakeshore. The NPS has purchased thousands of tracts of land in establishing the national lakeshore, but in many cases, the local governments retain ownership of public lands and roads in and around the federally-owned tracts. As a result, there are a number of developed streets in the project area that are owned in fee simple title (not rights-of-way) by the Town of Porter (Town), including Wabash Avenue, which is the west boundary of the project area, Johnson Beach Road (127th Avenue), Duneland Drive, and Dabbert Drive. In addition, there are platted, but undeveloped streets and alleys throughout the site that are also owned by the Town in fee simple title (Map 4). North-south-running streets have a 50-foot-wide ownership, east-west-running streets have a 60-foot-wide ownership, and alleys have a 15-foot-wide ownership. Johnson Beach Road serves as a paved permit parking area for approximately 25 vehicles. Permits are available to Town residents for $25/year, Indiana residents for $50/year, and to non-residents for $85/year. Permits allow parking in the lot based on availability, as many more permits are sold than spaces are available.

All Lake Michigan bottomlands and beach below the Ordinary High Water Mark (OHWM) are State Trust Lands owned and managed by the State of Indiana. In addition, the national lakeshore was donated a walking easement above the OHWM to the west of the project area to allow visitor access along the beach (Map 5). Table 1 identifies the ownership data along Porter Beach.

There are roughly 70 residences located just west of the project area, with Wabash Avenue providing the only access for them (Map 3). Due to heavy traffic on Wabash Avenue, particularly on summer weekends, these adjacent residents sometimes find it hard to exit their homes. Some residents have complained about beach use in front of their homes, as well as littering and theft. One residence, the Johnson's Inn on the corner of Johnson Beach Road and Wabash Avenue, provides a private parking area for beach users at a cost of $20-25/day.

The 2,182-acre Indiana Dunes State Park adjoins the project site on the east side, and the boundary is fenced (Map 3). The state park charges a $5/day (resident) and $10/day (non-resident) entrance fee and has had a yearly visitation of roughly 1.1 million visitors for each of the past two years. The three parking lots (West Lot, Pavilion Lot, and Auxiliary Lot) have a total capacity of over 1,000 vehicles, and the state park fills these lots nearly every summer weekend day. Often spaces in these lots turn over two to three times per weekend day. According to the state park manager, there are a significant number of people who enter the state park illegally from Porter Beach, since the beach boundary is not fenced. The Bird Observation Platform (near the NPS boundary), owned by the state park, is almost complete, and the state park is planning to convert the beach pavilion to a year-round restaurant and conference facility (personal communication with state park manager). The Dunes Prairie Nature Preserve, an area within the state park, is located just southeast of the project area.

The project area is heavily used by visitors in the summer, particularly on weekends. Vehicle counts for June 2011 indicated 62,310 visits in June; 81,133 in July; and 54,480 in August. These numbers may be skewed, however, due to vehicles continually driving through the site ("orbiting" as one ranger put it),

until a parking space can be found. No formal visitor use studies have been conducted for the site. On summer weekends, the parking spaces typically are full by 10:00 a.m. Since no parking is permitted or physically feasible along Waverly Road and Wabash Avenue, the only available parking is at the two NPS parking lots, the Town permit lot, or at privately-owned areas, such as the Johnson's Inn lot.

Passengers often are dropped off in the cul-de-sac area nearest the beach, and the driver circulates the parking lots to find an available space. This "orbiting" results in queues extending from the parking areas to Waverly Road, with queue lengths of 0.5 miles or more on summer weekends. Demand for parking exceeds the available parking spaces during most summer weekends. Available parking limits visitation to the beach.

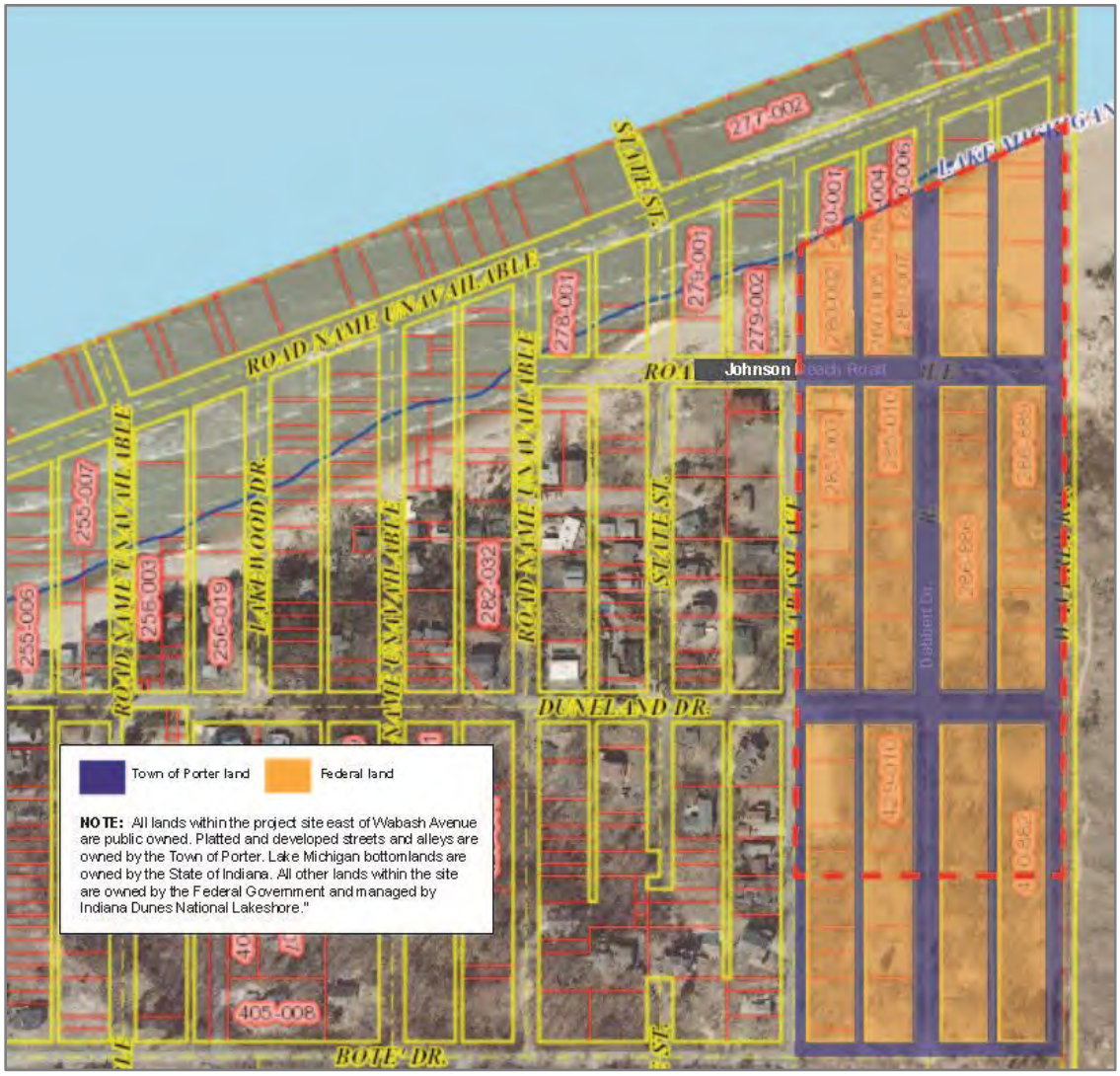
On overflow days (roughly 25 per year based on observations), the Town dispatches police to clear congestion. Due to the width of Wabash Avenue and the number of vehicles and pedestrians using this street, emergency vehicles have had difficulty accessing the residential area or the beach. Large vehicles, such as motorhomes, have been observed accessing the site and have had difficulty turning around at the end of the street. Due to frequent traffic backups, residents have complained of exhaust fumes from idling vehicles.

Existing NPS facilities at the site include two parking areas with a total capacity of 72 vehicles, a modern restroom with changing facilities and benches, a foot wash station, a bicycle rack, and accessible decking ("Superdeck") to the beach. Town of Porter facilities include the paved permit parking area (about 25-vehicle capacity), a bicycle rack, and a paved sidewalk along Wabash Avenue.

Much of the project area has been degraded by past uses. However, there are high-quality plant communities in the foredune and sand prairie land-vegetation cover types. Wildlife species observed at the site are common to the general area. Vegetation and wildlife are discussed in more detail in Chapter 3, "Affected Environment."

MAP 3. GENERAL PROJECT AREA/SITE DETAIL

MAP 4. AREA OWNERSHIP



MAP 5. LAKE MICHIGAN BEACH WALKING EASEMENT

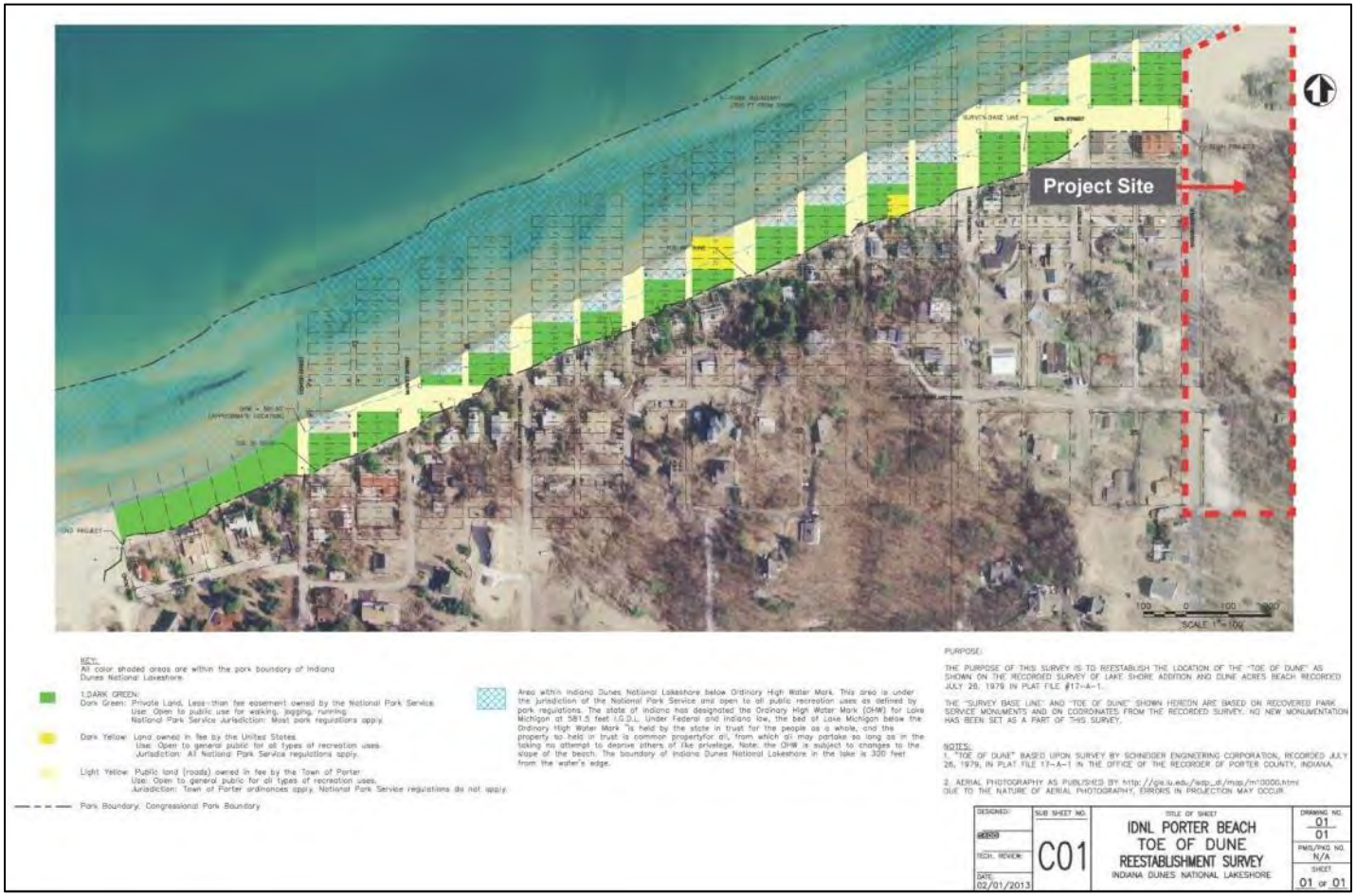


Table 1. Porter Beach Parcel Data

Disposition of Lands on the beach, West of Wabash to the town line of Dune Acres, within Indiana Dunes National Lakeshore:

Approximate total acres of beach west of Wabash, east of Dune Acres: 7.14 Acres

- State Trust Land (defined as beach below the Ordinary High Watermark – OHW): approximately 3 acres. This area can change with elevation changes on the shore. OHW is a fixed line at 581.5 feet International Great Lakes Datum
- Public Land owned by the Town of Porter above the OHW: approximately 1.5 acres
- Public Land owned by the NPS above the OHW: approximately 0.1 acres
- Walking easements – private property in which the NPS holds a less-than-fee interest allowing the public to traverse the property above the OHW: approximately 2.4 acres
- The private land above the OHW where there is no deeded public use: approximately 0.24 acres

Total percentage of beach west of Wabash open to all public use: 63.1%
Total percentage of beach west of Wabash open to limited (walking) public use: 33.6%
Total percentage of beach held as private land with no public use: 3.3%

East of Wabash:

Approximate total acres of beach east of Wabash, west of the state park:

- State Trust Land (defined as beach below the Ordinary High Watermark – OHW): approximately 0.51 acres. This area can change with elevation changes on the shore. OHW is a fixed line at 581.5 feet International Great Lakes Datum
- Public Land owned by the Town of Porter above the OHW: approximately 0.61 acres
- Public Land owned by the NPS above the OHW: approximately 3.31 acres
- Walking easements – private property in which the NPS holds a less-than-fee interest allowing the public to traverse the property above the OHW: None
- The private land above the OHW where there is no deeded public use: None

Total percentage of beach east of Wabash open to all public use: 100%

1.3 PLANNING CONTEXT

Project Background

The Indiana Dunes National Lakeshore enabling legislation (Public Law 89-761), as amended, identifies recreation as a primary purpose of the national lakeshore:

> "…to preserve for the educational, inspirational, and recreational use of the public certain portions of Indiana dunes and other areas of scenic, scientific, and historic interest and recreational value in the State of Indiana…"

The Act further states the authorization to construct visitor use and educational facilities as appropriate:

> "In order that the lakeshore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken therein which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures as the Secretary may designate: Provided, That the Secretary may provide for the public enjoyment and understanding of the unique natural, historic, and scientific features within the lakeshore by establishing such trails, observation points, and exhibits and providing such services as he may deem desirable for such public enjoyment and understanding: Providing further, That the Secretary may develop for appropriate public uses such portions of the lakeshore as he deems especially adaptable for such uses."

The *1997 East Unit General Management Plan Amendment* (NPS 1997a) identifies this site as a location for expanded parking and NPS restrooms. It also states:

> "Parking at Porter Beach will be expanded on NPS-owned former reservation of use sites by 25-50 spaces to accommodate more beach oriented recreation in the East Unit. New restrooms will replace the portable toilets now in use at Porter Beach.
>
> A new accessible boardwalk hiking trail near Porter Beach will lead to a nearby dune ridge, a good location for watching migrating hawks. This short trail will provide visitors with opportunities to learn about and watch the soaring hawks and to see the surrounding landscape, including the high dunes in the state park. Waysides or brochures at the new hawk watch platform will interpret the resources."

As a result of the 1997 GMP Amendment, the national lakeshore has added modern restrooms, a new 30-vehicle parking lot, and a drinking fountain. The national lakeshore has since determined that construction of a viewing platform at this location is not feasible due to the inability to construct an accessible ramp to the site. This Wabash Avenue/Porter Access Site project may provide an alternate experience at the site that is fully accessible and will offer wayside interpretation.

Other portions of the *1997 East Unit General Management Plan Amendment* (GMP) identify the intention of the national lakeshore to provide additional visitor use facilities:

> Visitor Use (page 40): "Recreational facilities at the East Unit of the national lakeshore will include walking, picnicking, camping (no utility hookups provided), nature study, bicycling on paved paths or roads, swimming at designated beaches, sunbathing, horseback riding on designated trails in the Ly-co-ki-we trail system, cross-country skiing, boating, and fishing…" and

> "Access to and use of national lakeshore facilities by disabled visitors will continue to be provided in conformance with applicable laws and regulations, specifically the Architectural Barriers Act of 1968 (PL 90-480), the Rehabilitation Act of 1973 (PL 93-112), and the Americans with Disabilities Act of 1990 (PL 101-336). Visitors with disabilities will be able to enjoy the national lakeshore and participate in recreational activities using the same facilities and programs as all visitors, to the greatest extent possible, commensurate with their abilities. Sensitive planning and design will facilitate this goal."

This project is consistent with this element in the GMP that calls for picnicking as a national lakeshore use and identifies the need to provide access for people with disabilities.

Picnicking is also addressed in the GMP in a separate section:

> Picnicking (page 42): "Picnic facilities at Tremont and other existing picnic areas will continue. A new picnic facility and overlook will be constructed on previously disturbed land near the east end of Lake Front Drive. Primary use and access will be by hikers and bikers. However, limited parking restricted to visitors with disabilities will be developed on former reservations of use sites."

Since 1997, the national lakeshore has taken steps to implement these plans at Porter Beach. About 10 years ago, a modern restroom facility was constructed to replace the portable toilets. The parking areas were improved and native plant beds were planted between the parking areas and Wabash Avenue. Accessible walkways were installed between Wabash Avenue and the beach. The national lakeshore has submitted formal funding requests and has some donated funds available for this project.

As recently as 2011, the national lakeshore was working closely with the Porter Town Council (Town Council) on plans for the site. Because of the potential impacts associated with this project, in 2011 the national lakeshore determined that an EA would be required.

Relationship to Other National Lakeshore Plans and Projects

A *Deer Management Plan/Environmental Impact Statement* was completed in June 2012. This document addresses the impacts of high deer densities (currently about 98 deer per square mile) on vegetation and wildlife in the national lakeshore, including one federally-listed and 135 state-listed plant species and many of the 113 species of birds that are considered regular nesters. The plan also identifies a number of actions that the NPS can take, in concert with other entities, including federal, state, and local communities that have previously taken deer management actions, in order to protect valuable resources, promote safety (especially involving vehicle accidents), and ensure a high-quality visitor experience. Without management, deer populations are expected to increase in the future due to continued lack of predators and favorable habitat conditions that are a result of human alterations to the landscape. (NPS 2012a)

A *Shoreline Restoration and Management Plan/Environmental Impact Statement* is currently underway for the national lakeshore's 13 miles of the southern Lake Michigan Shoreline. Development and installation of navigational harbors and shoreline stabilization structures (e.g., jetties, breakwaters, revetments, and bulkheads) has altered southern Lake Michigan's natural east to west littoral drift, resulting in significant accretion of sands east (up drift) of Michigan City and Burns International harbors, and the subsequent sand starvation to the west (down drift) of these harbors. The lack of continued sand replenishment from natural littoral drift has further resulted in extensive beach and dune erosion, threatening both public and private resources. The project area includes areas off-shore, the shoreline, and the foredunes. (NPS 2012b)

The *Great Marsh-Dunes Creek Lakeplain Prairie Restoration: Phase I-Inventory* project is currently underway to conduct inventories within the historic range of Great Marsh-Dunes Creek's Lakeplain wet-mesic prairie. Three work zones have been defined: Pepoon, Kurz, and Peattie. Inventory work will include vegetation analyses, mapping of the existing ditch system, and data collection that will include seedbank sampling, sampling for soil chemistry, and installation of shallow groundwater wells. Five phases of work will be required to restore the subject wetland: Phase I - Inventory; Phase II - Design; Phase III - Landscape modification (hydrology restoration, removal of woody growth); Phase IV - Establishment of native plant assemblages; and Phase V - Follow-up management. (NPS 2012c)

The *Porter Brickyard Trail Environmental Assessment* (NPS 2011a) was completed in 2011. This document identified alternative routes within the national lakeshore to connect with another Porter Brickyard Trail segment to the south on non-federal land. The result was the construction of the roughly four-mile-long Porter Brickyard Trail that connects the Calumet Trail (to the north) and the Prairie Duneland Trail to the south. The paved trail, with bridges over U.S. 12 and U.S. 20, was completed in the fall of 2012.

Purpose and Significance of the National Lakeshore

This project is consistent with the purpose and significance statements for the national lakeshore. Purpose statements convey the reason(s) for which the national park unit was set aside as part of the national park system. Grounded in an analysis of park legislation and legislative history, purpose statements also provide primary criteria against which the appropriateness of plan recommendations, operational decisions, and actions are tested. Significance statements capture the essence of the national park unit's importance to the nation's natural and cultural heritage. They describe the unit's distinctiveness and describe why an area is important within regional, national, and global contexts. This helps managers focus their efforts and limited funding on protection and enjoyment of attributes that directly relate to the significance of the national park unit.

The purpose of the national lakeshore is:

1) To preserve, restore, and protect outstanding ecological and biological diversity, along with the geologic features that characterize the southern shore of Lake Michigan.
2) To provide access for large, diverse populations to experience natural scenic open spaces, historic features, as well as educational, scientific, inspirational, and recreational opportunities.

The significance of the national lakeshore includes the following:

1) The national lakeshore is the natural laboratory from which Dr. Henry Cowles described his theory of ecological succession, and it offers outstanding opportunities for scientific research due to the outstanding plant diversity (nearly 1,200 native species) and complexity of its natural systems.
2) The wind-driven sand dunes at the national lakeshore are over 13,000 years old and have a rare east-to-west orientation. This mosaic of dunes and interdunal areas gave rise to the establishment and retention of a complex juxtaposition of eastern deciduous forests, prairies, savannas, wetlands, pannes, and boreal forests on which dune successional stages and processes can be observed in close proximity to each other.
3) The national lakeshore, as one of the first parks specifically created to bring national parks close to urban areas, provides outstanding scenic beauty and varied outdoor recreational activities on the Lake Michigan shoreline.
4) The landscape of the national lakeshore tells the story of 10,000 years of settlement, urbanization, industrialization, and the rise of environmental conservation and restoration.

This project is consistent with, and helps satisfy, purpose statement #2 and significance statement #3.

1.4 IMPAIRMENT

NPS *Management Policies 2006* (NPS 2006) require analysis of potential effects to determine if actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts to these resources and values.

However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within a park, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited 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 these resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment, but an impact is more likely to constitute an impairment when there is a major or severe adverse effect upon a resource or value for which 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
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

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

1.5 PURPOSE AND NEED FOR THE PROJECT

The purpose of this proposed project is to provide visitors with a safe and pleasing park experience, while protecting park resources. The project is needed to address a number of problems relating to vehicle and pedestrian circulation, lack of ADA access to the beach and restrooms, no accessible picnic area, inadequately designed parking lots, maintenance and safety issues, and resource damage.

Purpose and need statements, as provided to the public at the June 28, 2012, public scoping open house and on the NPS Planning, Environment, and Public Comment (PEPC) website, are as follows:

- The existing site has a number of current problems that need to be addressed, including vehicle and pedestrian circulation, lack of ADA-compliant accessibility to the beach and restrooms, no ADA-compliant picnic or seating area, inadequately designed parking lots, a no formal picnic area, and maintenance and safety issues.
- Create an attractive and distinctive venue that will complement the adjacent residential area and showcase the national lakeshore.
- Restore damaged dunes and prevent future dune damage by developing appropriate visitor facilities.

- Harmonize with the Town's purpose for the beach area (i.e., the Town's "front porch").
- Be compliant with state and federal laws relative to the shore, state trust lands, and national parks.

1.6 PROJECT OBJECTIVES

In order for the project to be a success, the following objectives must be addressed. These objectives were also provided to the public at the June 28, 2012, public scoping open house and on the NPS PEPC website:

- Reduce the impacts of traffic and visitors on residents through better facility design.
- Improve emergency access for fire, police, and ambulances to the beach and to local residents.
- Provide better traffic flow for everyone.
- Create a "showcase" destination, for the NPS and the community that will benefit all.
- Eliminate or reduce vehicle and pedestrian circulation problems, and include ADA access and safe pedestrian access.
- Develop a formal picnic area (including a picnic shelter and platform) that provides lake views, easy access to the beach, and is ADA-compliant.
- Emphasize better visitor accommodation for existing levels of visitation; the project is not designed as an effort to increase the number of visitors.
- Reduce Town maintenance costs related to erosion, facilities maintenance, and periodic sand removal.
- Improve the use and management of parking areas.
- The previous Town Council asked that the site have provisions for food service/concessions. The NPS is neutral on this element and will defer to the Town's interest in this particular attribute.

1.7 DRAFT ISSUES

During internal scoping, a number of draft issues were identified. These draft issues were also provided to the public at the June 28, 2012, public scoping open house and on the NPS PEPC website:

- Adjacent landowner concerns (including State Park management plans) – this is a national park and state trust beach.
- Visitor use (numbers, safety, accommodation, available facilities). Visitor use continues to increase and this trend is likely to continue. This is due to increased population, not NPS efforts to attract visitors.
- Traffic (circulation, parking, safety). Difficult for residents to get to and from their homes when traffic is heavy. Emergency vehicles cannot access the site during high-use times.
- The beach is public property under Indiana state law and the public want, and have the right, to use it.

- Dunes damage and sand movement (the dunes continue to slough off into roads and parking lots).
- Maintenance (mainly from dune damage, with maintenance costs to Town). Sand plowing from the parking lot is depositing asphalt, garbage, and toxic fluids onto NPS beach.
- Safety (the current inadequate sidewalks and poorly-designed shower lead to unsafe pedestrian routes)
- ADA compliance. Town and NPS are both required by law to provide ADA access to the waterline. There is no ADA accessible seating or picnic areas. Handicapped parking spots must meet the legal requirements for slope and safe access to the restroom and the beach.
- The Town is now forced to expend law enforcement time and costs in traffic management.
- Natural resources (especially Threatened and Endangered species and state sensitive species, designated habitat)
- Cultural resources
- Town does not want to lose revenue opportunities of their paid parking lot. NPS does not have an authority that allows NPS to charge a parking fee.
- Steep slopes

1.8 SCOPING

Scoping is the effort to involve agencies and the public in determining the issues to be addressed in the environmental assessment. Among other tasks, scoping determines:

- important issues and eliminates issues that are ultimately unimportant; allocates assignments among the interdisciplinary team members and other participating agencies;
- identifies related projects and associated documents;
- identifies permits, surveys, or consultations required by other agencies; and
- creates a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made.

The problems and needs at the site have been recognized for years, and the NPS has attempted to address them. About ten years ago, a modern restroom facility was constructed to replace the portable toilets. The parking areas were improved, and native plant beds were planted between the parking areas and Wabash Avenue. Accessible walkways were installed between Wabash Avenue and the beach. The national lakeshore submitted formal funding requests and has secured some donated funds for this project. As recently as 2011, the national lakeshore was working closely with the Town Council on plans for the site. National lakeshore staff made some presentations that provided conceptual drawings for some facilities (e.g., a picnic pavilion and viewing platform). In the fall of 2011, the national lakeshore decided to take a "fresh look" at problems and opportunities at the site. The national lakeshore decided that the EA process would be the appropriate action to take to identify possible alternatives and the impacts of those alternatives, and to encourage public participation in the process (Table 2). Funds were secured for development of the EA, and the project began early in 2012.

TABLE 2. THE ENVIRONMENTAL ASSESSMENT PROCESS

STEP 1	Define purpose and need, goals and objectives, and issues (internal scoping)
STEP 2	**Conduct external (public) scoping**
STEP 3	Prepare draft alternatives and impacts
STEP 4	Prepare environmental assessment
STEP 5	**Public review of environmental assessment**
STEP 6	Analysis of public comment
STEP 7	Prepare decision document
STEP 8	Release decision document to the public

Internal (agency) and external (public) scoping occurred prior to preparation of this EA. Internal scoping involved an interdisciplinary process to identify issues, develop a public involvement plan, identify data needs, and develop a planning process schedule. An internal scoping meeting was held on February 2, 2012, which was attended by members of the project planning team. Based on this meeting, a public involvement plan was developed that identified two stages in the process in which public comment would be solicited and considered: step 2, the public scoping stage and step 5, the public review of environmental assessment stage (highlighted in Table 2).

The public scoping open house press release was distributed to media outlets on June 6, 2012. A public scoping open house was held at the national lakeshore Visitor Center on June 28, 2012, attended by 48 persons. The open house consisted of a welcome station; initial public review of display materials in the exhibits room at the Indiana Dunes National Lakeshore Visitor Center, including purpose and need statements, goals and objectives, draft issues, and the planning process; brief project presentations in the auditorium; and more discussion in the exhibits room. Four identical stations, staffed by national lakeshore employees, were established in the exhibits room, each displaying a project area map and easel with flipchart paper. Participants were encouraged to provide comments on index cards available at the open house, on the four flipcharts provided, or via cards, letters, emails, and PEPC comments during the 30-day public scoping review period (June 28-August 1, 2012).

In addition to the comments noted on index cards or the flipcharts during the public open house, eight comments were received via the NPS PEPC website and one email. A summary of public comments is included in Chapter 5, “Consultation and Coordination.”

A meeting with some members of the Town Council was held on June 29, 2012, in order to better identify concerns and opportunities. A national lakeshore employee and two contractors participated.

An alternatives development workshop (Step 3 in Table 2) was held at the national lakeshore on August 13, 2012, with national lakeshore staff and contractors in attendance. The purpose of this workshop was to review and discuss the public comments received during public scoping, discuss issues and opportunities, identify draft alternatives, and identify the impacts of these alternatives on national lakeshore resources, adjacent landowners, and visitors.

1.9 SUMMARY OF IMPACT TOPICS

Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. Impact topics were identified based on legislative requirements, topics specified in Director's Order #12 and Handbook (NPS 2001), national lakeshore-specific resource information, as well as input during agency and public scoping.

Impact Topics Selected for Detailed Analysis

Geology and Soils (including Drainage Issues and Topography)

According to NPS *Management Policies 2006* (NPS 2006), the NPS actively seeks to understand and preserve the soil resources of parks, to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, and to prevent its contamination of other resources.

Excavation for construction of any proposed developments would disturb soils. Also, there are drainage issues at the site that must be addressed, and beach erosion occurs during storm events. Therefore, Geology and Soils is retained as an impact topic to allow for evaluation of these impacts.

Vegetation (including state-listed species)

The National Environmental Policy Act of 1969 (42 USC 4321 *et seq*.) calls for an examination of the impacts on all components of affected ecosystems prior to beginning a project. According to NPS *Management Policies 2006* (NPS 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. Vegetation would be affected by construction of any proposed developments; therefore, Vegetation is retained as an impact topic.

Wildlife (including state-listed species)

The national lakeshore supports a variety of wildlife. The NPS Organic Act, which directs national park units to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the national lakeshore's natural ecosystem. Removal of vegetation and the construction of facilities could affect the national lakeshore's wildlife; therefore, Wildlife is retained as an impact topic and will be addressed further.

Visitor Use and Experience

Visitor use and experience would change as a result of implementing this project. Therefore, Visitor Use and Experience has been retained as an impact topic.

Park Facilities and Operations

Any developments and activities proposed at this site will have an impact on park operations and maintenance. Therefore, Park Facilities and Operations has been retained as an impact topic.

Adjacent Landowners

There are roughly 70 residences at adjacent Porter Beach that could be affected by actions proposed in this document. In addition, the Town of Porter government and Indiana Dunes State Park, among others could be impacted. Therefore, Adjacent Landowners has been retained as an impact topic.

Traffic Patterns and Volume

The lack of vehicle circulation affects residents due in part to the existing dead-end roadway network. Visitors to the national lakeshore are affected due to the lack of connectivity between parking lots. Parking demand exceeds the number of available parking spaces, resulting in vehicles circulating within the parking lots and on Wabash Avenue to find available spaces. Pedestrians and bicyclists share the narrow roadway with vehicular traffic. Frequency and response times of emergency personnel may be adversely affected by congestion and the lack of circulation within the study area. Therefore, Traffic Patterns and Volume has been retained as an impact topic.

Air Quality

Section 118 of the 1963 Clean Air Act (42 U.S.C. 7401 *et seq*.) requires a national park system unit to meet all federal, state, and local air pollution standards. The national lakeshore is a Class II air quality area under the Clean Air Act, as amended. A Class II designation 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.

Construction activities, including equipment operation and the hauling of material, could result in temporarily increased vehicle exhaust and emissions, as well as inhalable particulate matter. Construction dust associated with exposed soils would be controlled, if necessary, with the application of water or other approved dust palliatives. In addition, any hydrocarbon, nitrogen dioxide, or sulfur dioxide emissions, as well as airborne particulates created by fugitive dust plumes, would be rapidly dissipated because the location of the park and prevailing winds that allow for good air circulation. However, changes in vehicle circulation could still affect exhaust emissions. Therefore, Air Quality has been retained as an impact topic.

Impact Topics Dismissed

The alternatives being evaluated in this environmental assessment will not impact the following topics.

Natural Soundscapes

NPS Director's Order #47: *Soundscape Preservation and Noise Management* (NPS 2000) and NPS *Management Policies 2006* (NPS 2006) direct NPS managers to protect, maintain, or restore natural soundscapes unimpaired by inappropriate or excessive noise. Under this directive, noise is defined as "an unwanted or undesired sound, often unpleasant in quality, intensity or repetition."

None of the alternatives addressed in this analysis would introduce long-term inappropriate sounds to the national lakeshore. The temporary sounds produced during construction would result in negligible, short-term, localized adverse impacts. Therefore, Natural Soundscapes was dismissed as an impact topic.

Night Sky/Lightscapes

The NPS Night Sky Initiative and NPS *Management Policies 2006* (NPS 2006) direct the NPS to "preserve to the greatest extent possible, the natural lightscapes of the parks, which are natural resources and values that exist in the absence of human-cause light." The NPS is currently developing the Night Sky Initiative to formulate a policy to protect views of the stars and planets in our national parks. Since no artificial lighting is proposed in this project, Night Sky/Lightscapes was dismissed as an impact topic for further consideration.

Floodplains

According to the Indiana Department of Natural Resources floodplain map, the Lake Michigan beach wash zone is considered an "Effective Floodplain," and is further characterized as "1% Annual Chance Flood Hazard – Zone AE (Detailed)" (Indiana DNR 2012). All developments proposed in this project, in any alternative and including picnic platforms and shelters, lie outside the Effective Floodplain, except the accessible decking to the beach. However, decking such as this is considered an *excepted action*, according to NPS Procedural Manual 77-2: Floodplain Management (NPS 2012d), since this type of development is located near water, specifically to provide water access. Therefore, Floodplains was dismissed as an impact topic for further consideration.

Wetlands

Executive Order 11990, *Protection of Wetlands*, requires federal agencies to avoid, where possible, adversely impacting wetlands. The goal of NPS wetlands management is to strive to achieve no net loss of wetlands, as defined by both acreage and function. According to Director's Order #77, Procedural Manual #77-1: *Wetland Protection* (NPS 2011b), for proposed new developments that have the potential for direct or indirect adverse impacts to wetlands, the NPS will employ a sequence of 1) avoiding the adverse wetland impacts to the extent practicable, 2) minimizing the impacts that could not be avoided, and 3) compensating for remaining unavoidable adverse wetland impacts via restoration of degraded wetlands. Because there are no wetlands in the project area, Wetlands was dismissed as an impact topic.

Water Quality

NPS Management Policies 2006 (NPS 2006) require protection of water quality consistent with the Clean Water Act. Water quality at the national lakeshore is managed in accordance with this Act, Executive Order 12088, and NPS Management Policies. No action alternative will have measurable changes in the water quality at the site. Therefore, Water Quality was dismissed as an impact topic for further consideration.

Federally-listed Threatened and Endangered Species

There are no federally-listed threatened or endangered species in the project area and no federally-listed species that would be affected by the project. Piping Plover critical habitat has been designated in Unit IN-1: Indiana Dunes National Lakeshore and Indiana Dunes State Park Beaches, and the critical habitat extends from the western boundary of the Cowles Bog Unit to Kemil Road. However, according to the U.S. Fish and Wildlife Service (FWS 2012), existing developments, such as the project area, are not critical habitat, even when included within the designated critical habitat boundaries, because they lack the "primary constituent elements," one of which is a low level of disturbance. Therefore, Federally-listed Threatened and Endangered Species was dismissed as an impact topic.

Prime and Unique Agricultural Lands

Prime farmland, as defined by the Council on Environmental Quality 1980 memorandum, has 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. These designations were established by the Natural Resource Conservation Service, following soil and resource analyses. There are 16 soil units classed as prime or unique in Porter County, and five of those 16 occur in the East Unit of the national lakeshore. However, no soils within the project site are defined as prime or unique. Therefore, Prime and Unique Agricultural Lands was dismissed as an impact topic.

Land Use

The project area is located within the boundaries of the national lakeshore. The overall use and purpose of the site is consistent with planning documents and adjacent land use; therefore, Land Use was dismissed as an impact topic.

Environmental Justice

Presidential Executive Order 12898, General 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 the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to 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 a 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 "fair treatment" is not to shift risks among populations, but to identify potential adverse effects that are disproportionately distributed and identify alternatives that may mitigate these impacts. The general vicinity of the national lakeshore contains both minority and low-income populations; however, Environmental Justice was dismissed as an impact topic for the following reasons:

- The national lakeshore staff and planning team solicited public participation as part of the planning process and gave equal consideration to all input from persons, regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the preferred alternative would not result in any identifiable a verse human health effects. Therefore, there would be no direct or indirect adverse effects on any minority or low-income population.
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The national lakeshore staff and planning team do not anticipate any impacts on the socioeconomic environment to appreciably alter the physical and social structure of the nearby communities.

Cultural Resources

The National Historic Preservation Act, as amended (16 USC 470 *et seq*.); the National Environmental Policy Act (42 USC 4321 *et seq*.); Director's Order #28: *Cultural* Resource Management Guideline (NPS 1997b), Management Policies 2006 (NPS 2006); and Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision Making (NPS 2001) all require the consideration of potential impacts on archeological resources, Indian trust resources, historic structures, cultural landscapes, museum collections, and ethnographic resources listed in or eligible for listing in the National Register of Historic Places.

Archeological Resources

Archeological resources are the material remains or physical evidence of past human life or activities. There is very little known for archeological resources within the project area, and there are currently no known archeological sites recorded. The area has been heavily impacted by previous development. These developments have substantially reduced the likelihood that intact archeological sites could be located in the area. However, there may be small areas that have escaped previous development and could contain archeological resources that have not yet been identified, but there has been no systematic archeological investigation within this area that could provide information on the presence or absence of archeological resources. The closest archeological inventory was conducted by Forest Frost more than 0.3 miles south of the proposed project area (Frost 2001). The closest recorded archeological sites, as identified by Frost, are nearly 0.6 miles south of the proposed project area.

Prior to any construction on the site, an archeological inventory will be conducted for any areas within the project area that feature intact landforms and have not been disturbed by previous development. The areas that require archeological inventory can be determined based on additional detailed project information that illustrates disturbed areas and places in which intact landforms may exist.

Indian Trust Resources

Indian trust assets are owned by American Indians, but are held in trust by the United States. Requirements are included in the Secretary of the Interior's Secretarial Order 3206, *American Indian* Tribal Rites, Federal – Tribal Trust Responsibilities, the Endangered Species Act, and Secretarial Order 3175, *Departmental Responsibilities for Indian Trust Resources*. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. 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, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in the national lakeshore. The lands comprising the national lakeshore are not held in trust by the Secretary of the Interior for the benefit of Indians. Therefore, Indian Trust Resources was dismissed as an impact topic in this environmental assessment.

Historic Structures

The National Historic Preservation Act, as amended (16 USC 470 *et seq*.); the National Environmental Policy Act (42 USC 4321 *et seq*.); Director's Order #28: *Cultural Resource Management Guideline* (NPS 1997b), *Management Policies 2006* (NPS 2006); and Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001) all require the consideration of potential impacts on archeological resources, historic structures, and cultural landscapes listed in or eligible for listing in the National Register of Historic Places.

Historic structures on or near the project area include:

The Solbeck Property

Built circa 1930, this property is an example of the Craftsman-influenced vernacular beach house that was common in the Indiana Dunes during the 1920s and 1930s, but that rarely survives in an unaltered state. As such, the house was found eligible for the National Register of Historic Places by the NPS, with concurrence from the Indiana Department of Natural Resources, Division of Historic Preservation & Archeology (State Historic Preservation Office). However, the house was built on wood pilings and, due to the natural movement of the dunes, is slipping down the north face of the dune. The site, which has no vehicular access, is also located adjacent to bird nesting areas. To preserve the house would entail substantial damage to the adjacent dune area (and natural resources), associated with bringing in construction equipment, and would disturb the nesting areas. As such, the NPS is considering the removal of the house.

Johnson's Inn

Built circa 1925, this property was found potentially eligible for the National Register of Historic Places during the county-wide inventory under the themes of Architecture and Entertainment/Recreation. The inventory was completed under the guidance of the Indiana Department of Natural Resources, Division of Historic Preservation & Archeology (State Historic Preservation Office).

The Solbeck property will likely be removed because of issues discussed above and Johnson's Inn is outside the project and will not be affected by it. Therefore, Historic Structures was dismissed as an impact topic.

Cultural Landscapes

According to Director's Order #28: *Cultural Resource Management Guideline* (NPS

1997b), 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. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions."

Thus, cultural landscapes are the result of the long interaction between people and the land and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land use and management practices, politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past and a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge.

There are no formal or informal cultural landscapes in the project area; therefore, Cultural Landscapes was dismissed as an impact topic.

Ethnographic Resources

Ethnographic resources are defined by the NPS 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" (Director's Order #28: *Cultural Resource Management Guideline*, 181) (NPS 1997b). There are no known ethnographic resources or traditional cultural properties in the vicinity of the project area. Copies of the environmental assessment will be forwarded to each tribe traditionally associated with park lands for review and comment. If the tribes subsequently identify the presence of ethnographic resources, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of ethnographic sites would not be made public. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed. Because there are no known ethnographic resources within the area of potential effects, Ethnographic Resources was dismissed as an impact topic.

CHAPTER 2. ALTERNATIVES

A range of alternatives was developed to address the issues identified in Chapter 1 and have been evaluated throughout the preparation of this environmental assessment. Several alternatives were considered and dismissed because they did not meet project objectives or because they had the potential to produce unacceptable levels of adverse impacts. The alternatives dismissed from further consideration in this document are described later in this chapter, under the heading "Alternatives Considered but Dismissed."

Although the option of continuing current management (No Action) does not address the identified issues, current conditions are used as the baseline against which the action alternatives are analyzed. This is the context for determining the relative magnitude and intensity of impacts (NPS 2006). The No Action Alternative is referred to as "Alternative 1, Continue Current Management (No Action)" in this environmental assessment.

2.1 ALTERNATIVE 1 – CONTINUE CURRENT MANAGEMENT (NO ACTION)

Under Alternative 1, no major developments on the site would occur. The Indiana Dunes National Lakeshore (national lakeshore) staff would continue to manage the site as at present, ensuring that visitors and resources are protected.

2.2 ALTERNATIVE 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed to provide for greater pedestrian safety. Methods to improve access to the beach at the end of Wabash Avenue would continue to be explored and implemented. Both of these actions would require Town of Porter (Town) cooperation and approval for implementation. Additionally, the south parking lot would be upgraded (e.g., wheel stops and improved surface) within the existing footprint. (Map 6)

2.3 ALTERNATIVE 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue. Five-foot-wide bike lanes would be constructed along Wabash Avenue to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. A picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. Paths that are compliant with the American's with Disabilities Act of 1990 (ADA) would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. This lot would be constructed of gravel or some other permeable surface. Additionally, the south parking lot would be upgraded (e.g., wheel stops and improved surface) within the existing footprint. Many of these proposed developments would require Town of Porter cooperation and approval for implementation. (Map 7)

2.4 ALTERNATIVE 4

Alternative 4 would provide a variety of improvements to the site. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue. This circulating roadway would increase the space available for moving vehicles when searching for available parking spaces; a distance of 0.2 miles or more is possible to reduce the length of the queues on the existing public street network. Construction of a new looped roadway could utilize emerging concepts for green roadways that define and quantitatively measure roadway sustainability, including permeable pavements, storm water management, and the use of local materials. Individual picnic platforms and shelters would be constructed east of and adjacent to the two National Park Service (NPS) parking lots. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities. The south parking lot would be upgraded (e.g. wheel stops and improved surface) within the existing footprint. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. This overflow lot could be constructed along the loop connector, or alternatively, a separate lot could be constructed and located as in Alternative 3. Either lot would be constructed of gravel or some other permeable surface. The sidewalk along Wabash Avenue would be raised, widened, and curbed to provide for greater pedestrian safety. Many of these proposed developments would require Town of Porter cooperation and approval for implementation. (Map 8)

2.5 ALTERNATIVE 5 (THE PREFERRED ALTERNATIVE)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot with an approximate 100 vehicle capacity would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. Entrance to this parking lot would be from Wabash Avenue, and vehicles would be notified by signage that this new parking lot is the *only* general parking available. When the parking lot is full, it would be closed, and vehicles would make the short loop back to Wabash Avenue, then be required to turn left (southbound). Vehicles parked in this new parking lot would also be required to turn left (southbound) on Wabash Avenue when exiting. The existing north lot would be open only during the summer months to visitors with valid handicapped placards. In the off-season, the new south parking lot would be closed, and all visitors would use the north parking lot. Adjacent residents and vehicles with valid Town parking permits would have access north on Wabash Avenue. Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. An additional picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the beach picnic facility to the beach. Many of these proposed developments would require Town of Porter cooperation and approval for implementation. (Map 9)

2.6 ACTIONS COMMON TO ALL ACTION ALTERNATIVES

The erosion problems associated with the foot-wash station would be corrected and interpretive waysides would be developed. Measures would be taken to protect the fragile dunes. Barriers, such as snow fencing and 4 x 4 posts with vinyl cables, as used in other areas of the national lakeshore, would be placed in needed areas. Signs would be posted and native vegetation plantings or spreading woody debris could be used to discourage social trails. The national lakeshore would also cooperate with the state park to develop ways to eliminate or reduce damage to the dune environment.

Additionally, options for developing an advanced warning sign system would be evaluated. An advanced warning sign to indicate when long queues are present would provide information to motorists wanting to access Porter Beach prior to reaching the queues. Options include a range of sign and message possibilities that assume alternate route markers are used to redirect traffic to State Park Road to reduce congestion near the Porter Beach area, including:

- A series of ground-mounted signs warning of seasonal congestion along Waverly Road.
- A pedestal-mounted warning sign (yellow) with a legend of "Congestion Ahead" may be supplemented with a flashing beacon. Placement of advance signing on Waverly Road is proposed to be 500 feet in advance of State Park Road and on the north leg of the U.S. 12 intersection. The flashing beacon could be activated by using a standard inductive loop that senses the presence of a stopped vehicle on 130th Street.
- Variable message signs may be deployed to provide congestion, beach safety, national lakeshore information, and public safety information as beachgoers approach Porter Beach. Specific information related to congestion may include estimated delay times, alternate route options, and vehicle/pedestrian safety tips. Telephone or Ethernet connections could enable changes to standard messages from a remote location.

Installation of signs may include video surveillance of road conditions to help manage traffic congestion during peak periods. Video surveillance images could be accessed by local public safety agencies and the national lakeshore.

MAP 6. ALTERNATIVE 2

MAP 7. ALTERNATIVE 3

MAP 8. ALTERNATIVE 4

MAP 9. ALTERNATIVE 5 (THE PREFERRED)

2.7 ALTERNATIVES CONSIDERED BUT DISMISSED

A number of possible options were offered by the public during scoping:

- **Transfer the NPS land to the Town of Porter or Indiana Dunes State Park**. The NPS land in the project area was acquired to protect valuable resources and provide for appropriate visitor use. While the NPS does transfer lands to other political entities, it is not done without a full analysis of the impacts of such action. A land transfer is not within the scope of this document.
- **Consider a remote parking lot with beach access by tram.** This is an interesting idea that could be considered in a future study of the site. There are a number of questions that would need to be addressed, such as who would provide the service and who would pay for the service.
- **Perform a beach carrying capacity study to determine maximum beach capacity**. The beach area is not overcrowded. The number of visitors is limited to available parking, not the area of the beach.
- **Split beach traffic and resident traffic further out and provide a way for traffic to turn around and get out without causing more congestion**. Try to develop another road—one in, one out. The NPS retained the services of a Transportation Engineer to analyze the situation. Any new access road developments would be very costly and infeasible to describe in this plan.
- **Return the area to its natural state**. This site was addressed in the 1997 East Unit General Management Plan Amendment (GMP) as a location for expanded parking and NPS restrooms (see section 1.3, "Planning Context"). This project is consistent with the GMP, which was prepared with full public involvement. Returning the site to a natural state would not be consistent with the intent of the GMP.
- **Pavement widening of the existing public roadway network**. A possible option was identified during planning for this project. Pavement widening of the existing public roadway network between the project area and Highway U.S.-12 could be conducted to accommodate pedestrian and bicycle traffic. Existing pavement widths of 18 to 20 feet could be increased to 30 feet to provide a minimum lane width of 10 feet and a paved shoulder/bike lane of 5 feet on both sides of the road. Improvements to Wabash Avenue, 130th Street, Waverly Road, and State Park Road were identified. The increased shoulder width would also provide additional pavement for vehicles to accommodate emergency vehicle traffic. A minimum path of 15 feet would be available to emergency vehicles if traffic moved to the edge of the improved roadway section. This option was not included in any proposed alternative because it was determined to be very costly and would impact adjacent wetlands along much of the route.
- **Provide a new public street connection between East Road and Dudley Drive**. During the transportation analysis, an option was identified to provide a new public street connection between E Road and Dudley Drive. A path is currently closed where residents between Porter Beach and the Dune Acres development could have alternate access. Emergency response, in the event that Waverly Road or County Road 100W was closed, would be greatly improved if this connection between the existing roadways was made permanent. This option was not included in any proposed alternative because it was deemed to be an alternative that would not be favored by residents in that area and would require major road development.

2.8 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

As stated in Section 2.7D of the Director's Order #12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001), the environmentally preferable alternative is the alternative that would promote the national environmental policy expressed in the National Environmental Policy Act.

Section 101(b) of the National Environmental Policy Act identifies six criteria to help determine the environmentally preferable alternative. The act directs that federal plans should:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- 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;
- Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources, and approach the maximum attainable recycling of depletable resources.

Generally, this means the alternative that causes the least damage to the biological and physical environment. It also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources (Council on Environmental Quality 1981).

Continuing the current conditions under Alternative 1, No Action, would result in no major developments and would not meet the project objectives stated in section 1.6.

Alternative 2 would provide a sidewalk along Wabash Avenue and improve pedestrian beach access. This alternative would have little impact on the natural environment, but would not fully satisfy project objectives.

Alternative 3 would provide a picnic facility near the beach, a system of ADA-compliant paths, a direct connection between the two NPS parking lots, overflow parking, and bike lanes and better emergency vehicle access through widening Wabash Avenue. There would be long-term, minor, adverse impacts to geology and soils and vegetation from development of the picnic facility and paths, but these could be mitigated by careful siting (e.g., placing the picnic area at the site of two former houses, west of the high-quality foredune area). This alternative fully addresses most project objectives.

Alternative 4 would provide picnic areas near the parking lots, limited ADA-compliant paths, a looped connection between the two NPS parking lots, and overflow parking. There would be long-term, minor, adverse impacts to geology and soils and vegetation from development of the paths and looped connection, but these could be mitigated by careful siting. This alternative fully addresses many of the project objectives, except notably a picnic facility near the beach.

Alternative 5 would provide a larger parking lot near Duneland Drive, handicapped parking only at the north lot during the summer, small picnic areas adjacent to each NPS parking lot and near the beach, and ADA-compliant paths. There would be long-term, minor, adverse impacts to geology and soils and vegetation from development of the paths and new parking lot, but these could be mitigated by careful siting. The new larger parking lot location is in an area of heavily-degraded vegetation. This alternative fully addresses many of the project objectives, in that it reduces congestion on Wabash Avenue and provides a variety of picnicking experiences at three locations.

Therefore, Alternative 2 is the environmentally preferable alternative since it causes the least damage to the biological and physical environment.

2.9 COMPARISON OF IMPACTS BY ALTERNATIVE

The following Table 3 summarizes the impacts under each alternative.

TABLE 3. COMPARISON OF IMPACTS BY ALTERNATIVE

IMPACT TOPIC	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (PREFERRED ALTERNATIVE)	ACTIONS COMMON TO ALL ACTION ALTERNATIVES
GEOLOGY AND SOILS	Erosion from social trails, drainage problems, wind-blown sand, and beach erosion during storm events. Impacts would be long-term, minor, and adverse.	Most development on previously disturbed soils (except for ADA-compliant path impacting dune near Wabash Avenue end). Impacts would be long-term, minor, and adverse.	Development of ADA-compliant paths, picnic area near beach, direct connection between the two NPS lots, and overflow parking lot would result in long-term, minor, and adverse impacts.	Development of ADA-compliant path from parking to the beach, looped connection between the two NPS parking lots, and overflow parking lot would result in long-term, minor, and adverse impacts.	Development of new larger south parking lot, ADA-compliant paths, and picnic areas would result in long-term, minor, and adverse impacts.	Some long-term, minor, and beneficial impacts from actions common to all alternatives (foot-wash station erosion correction, dune restoration, and south lot upgrades).
VEGETATION	Trampling from social trails, especially on steep slopes, would result in long-term, minor, and adverse impacts.	All development on previously disturbed soils (except for ADA-compliant path impacting dune near Wabash Avenue end). Will avoid "high-quality areas." Impacts would be long-term, minor, and adverse.	Development of ADA-compliant path from parking to the beach and paths surrounding the picnic area, development of direct connection between the two NPS lots (area has been heavily degraded), potential bisection of "high-quality areas" by picnic area near the beach if located to east to avoid high erosion areas, and heavily degraded possible overflow parking lot site (old house sites). Impacts would be long-term, minor, and adverse.	Development of ADA-compliant path from parking to the beach, development of looped connection between two NPS lots (will bisect "high-quality areas"), and heavily degraded possible overflow parking lot site (old house sites). Impacts would be long-term, minor, and adverse.	Development of new larger south parking lot, ADA-compliant paths, and picnic areas would result in long-term, minor, and adverse impacts.	Some beneficial impacts particularly from dune restoration. Impacts would be short-term, negligible, and adverse during restoration and in the long-term, minor and beneficial.

IMPACT TOPIC	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (PREFERRED ALTERNATIVE)	ACTIONS COMMON TO ALL ACTION ALTERNATIVES
WILDLIFE	Social trails impact wildlife by destroying habitat, resulting in long-term, minor, and adverse impacts.	Wildlife in project area is common to the general area and may be displaced by proposed actions. Impacts would be short-term, negligible, and adverse.	Wildlife in project area is common to the general area and may be displaced by proposed actions. Impacts would be short-term, negligible, and adverse.	Wildlife in project area is common to the general area and may be displaced by proposed actions. Impacts would be short-term, negligible, and adverse.	Wildlife in project area is common to the general area and may be displaced by proposed actions. Impacts would be short-term, negligible, and adverse.	Some beneficial impacts particularly from dune restoration. Impacts would be short-term, negligible, and adverse during restoration and in the long-term, minor and beneficial (improved habitat).
VISITOR USE AND EXPERIENCE	Unsafe pedestrian access along Wabash Avenue, traffic problems, little shade and no formal picnic facilities, and beach not universally accessible. Impacts are long-term, minor, and adverse.	Improved pedestrian access to beach and no increase in number of visitors. Impacts would be long-term, minor, and beneficial.	Improved pedestrian access to beach and formal picnic area with ADA-compliant paths to beach and parking. Some increase in visitors on summer weekends (due to overflow parking). Impacts would be long-term, moderate, and beneficial.	Improved pedestrian access to beach and formal picnic area at parking lots. Some increase in visitors on summer weekends (due to overflow parking). Impacts would be long-term, moderate, and beneficial.	Improved pedestrian access to beach and formal picnic areas at parking lots and beach. Increase in visitors in summer (due to new, larger parking lot). Impacts would be long-term, moderate, and beneficial.	Some long-term, minor, and beneficial impacts from actions common to all alternatives (foot-wash station erosion correction, dune restoration, and south lot upgrades, wayside exhibits, and advanced traffic warning system).
NATIONAL LAKESHORE FACILITIES AND OPERATIONS	NPS would continue to maintain existing facilities, resulting in long-term, minor, and beneficial impacts to facilities, but long-term, minor, and adverse impacts to operations.	Actions would result in less maintenance for sand removal on ADA-compliant path (due to design), but additional staff time required to construct and maintain ADA-compliant path to beach. Impacts would be long-term, minor, and adverse.	Actions would result in less maintenance for sand removal on ADA-compliant paths (due to design), but more paths required to be maintained. Increased maintenance of new picnic facilities. Impacts would be long-term, moderate, and adverse.	Actions would result in less maintenance for sand removal on ADA-compliant paths (due to design), but more paths required to be maintained. Increased maintenance of new picnic facilities. Impacts would be long-term, moderate, and adverse.	Actions would result in less maintenance for sand removal on ADA-compliant paths (due to design), but more paths required to be maintained. Impacts would be long-term, moderate, and adverse.	Increased law enforcement time to manage new traffic control system. Increased effort to develop and maintain interpretive waysides. Increased maintenance and monitoring of restored dunes. Increased maintenance of upgraded south parking lot. Impacts would be long-term, minor, and adverse.

IMPACT TOPIC	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (PREFERRED ALTERNATIVE)	ACTIONS COMMON TO ALL ACTION ALTERNATIVES
ADJACENT LANDOWNERS	Adjacent landowners would continue to experience access problems and complain about litter, vandalism, and noise. Impacts would continue to be long-term, moderate, and adverse.	Actions would result in less pedestrian traffic on Wabash Avenue. Impacts would be long-term, negligible, and beneficial.	Actions would result in better traffic flow due to parking lot connection that may reduce traffic on Wabash Avenue from "orbiting." Bike lanes provide safe bicycling and improve emergency access. ADA-accessible picnicking and paths available for adjacent landowners and all visitors. Overflow parking (summer weekends) may reduce traffic on Wabash Avenue from "orbiting." Additional site visitors (due to increased parking capacity in the overflow lot) could increase noise and congestion. Impacts would be long-term, minor, and beneficial.	Actions would result in better traffic flow due to parking lot looped connection that may reduce traffic on Wabash Avenue from "orbiting." ADA-accessible picnicking and paths available for adjacent landowners and general public. Overflow parking (summer weekends) may reduce traffic on Wabash Avenue from "orbiting." Additional site visitors (due to increased parking capacity in the overflow lot) could increase noise and congestion. Impacts would be long-term, minor, and beneficial.	Actions would result in better traffic flow due to new south parking and requirement to exit site when leaving parking. ADA-accessible picnicking and paths available for adjacent landowners and general public. Additional visitors (due to increased parking capacity in the south lot) could increase noise and congestion. Impacts would be long-term, moderate, and beneficial (for vehicle traffic) and long-term, minor, and adverse (due to more visitors on the site and potential conflicts).	Advanced warning system, if implemented and successful, would reduce traffic congestion on roads leading to site. Impacts would be long-term, minor, and beneficial.
TRAFFIC PATTERNS AND VOLUME	Traffic patterns and volume would continue as at present, making it difficult for residential and visitor access. Impacts would continue to be long-term, moderate, and adverse.	Greater pedestrian safety from raised sidewalk. Impacts would be long-term, negligible, and beneficial.	Better traffic flow due to parking lot connection may reduce traffic on Wabash Avenue from "orbiting." Greater visitor safety from off-street paths and bike lanes. Overflow parking (summer weekends) may reduce traffic on Wabash Avenue from orbiting. Impacts would be long-term, minor, and beneficial.	Better traffic flow due to parking lot looped connection may reduce traffic on Wabash Avenue from "orbiting." Greater pedestrian safety from raised sidewalk. Overflow parking (summer weekends) may reduce traffic on Wabash Avenue from orbiting. Impacts would be long-term, minor, and beneficial.	Better traffic flow due to new south parking lot and requirement to exit site when leaving parking. Greater pedestrian safety from off-street ADA-compliant paths. Impacts would be long-term, moderate, and beneficial.	Advanced warning system, if implemented and successful, would reduce traffic congestion on roads leading to site. Impacts would be long-term, minor, and beneficial.

IMPACT TOPIC	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (PREFERRED ALTERNATIVE)	ACTIONS COMMON TO ALL ACTION ALTERNATIVES
AIR QUALITY	Air quality would remain as at present, with long-term, negligible, and adverse impacts from idling vehicle exhaust emissions.	Sidewalk construction activities would result in short-term, negligible, and adverse impacts.	Construction activities would result in short-term, negligible, and adverse impacts. Reduced "orbiting" from parking connection would reduce the amount of auto exhaust emission, resulting in long-term, negligible, and beneficial impacts.	Construction activities would result in short-term, negligible, and adverse impacts. Reduced "orbiting" from looped parking connection would reduce the amount of auto exhaust emission, resulting in long-term, negligible, and beneficial impacts.	Construction activities would result in short-term, negligible, and adverse impacts. Reduced traffic on Wabash Avenue due to new south parking lot and requirement to exit site when leaving parking would reduce the amount of auto exhaust emission, resulting in long-term, negligible, and beneficial impacts.	Advanced warning system, if implemented and successful, would reduce traffic congestion on roads and reduced vehicle emissions. Impacts would be long-term, minor, and beneficial.

2.10 PROJECT OBJECTIVES BY ALTERNATIVE

The following Table 4 illustrates how well each alternative addresses the objectives defined in section 1.6 of Chapter 1 of this environmental assessment.

TABLE 4. PROJECT OBJECTIVES BY ALTERNATIVE

OBJECTIVE	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (THE PREFERRED)
Reduce the impacts of traffic and visitors on residents through better facility design.	Does not address this objective.	Does not address this objective.	Partially addresses this objective: provides a direct connection between the south and north parking areas (keeping vehicles off Wabash Avenue longer), and provides an overflow parking lot during summer weekends.	Partially addresses this objective: provides a looped connection between the south and north parking areas (keeping vehicles off Wabash Avenue longer), and provides an overflow parking lot during summer weekends.	Addresses this objective: Provides a new south parking lot that requires visitors to exit parking to the south, away from the residential areas.
Improve emergency access for fire, police, and ambulances to the beach and to local residences.	Does not address this objective.	Does not address this objective.	Partially addresses this objective: develops bike lanes on either side of Wabash Avenue that could be used as temporary parking areas during emergencies, and provides for better access to the beach with compliant paths.	Partially addresses this objective: the connection between the two NPS lots may reduce traffic on Wabash Avenue, and the overflow lot may reduce traffic congestion on Wabash Avenue.	Addresses this objective: Provides a new south parking lot that requires visitors to exit parking to the south, away from the residential areas.
Provide better traffic flow for everyone.	Does not address this objective.	Does not address this objective.	Partially addresses this objective: provides a direct connection between the south and north parking areas (keeping vehicles off Wabash Avenue), and provides an overflow parking lot during summer weekends.	Partially addresses this objective: provides a looped connection between the south and north parking areas (keeping vehicles off Wabash Avenue), and provides an overflow parking lot during summer weekends.	Addresses this objective: Provides a new south parking lot that requires visitors to exit parking to the south, away from the residential areas.
Create a “showcase” destination, for the NPS and the community that will benefit all.	Does not address this objective.	Does not address this objective.	Fully addresses this objective: develops picnicking facilities near the beach with ADA-compliant paths to the beach and from parking, develops an ADA-compliant path from the NPS lots, and provides better traffic flow with the direct connection between the two NPS lots and the overflow lot.	Partially addresses this objective: develops picnic facilities near the NPS lots (not the beach), develops an ADA-compliant path from the NPS lots, and provides better traffic flow with the direct connection between the two NPS lots and the overflow lot.	Addresses this objective: develops picnicking at numerous locations, provides ADA-compliant paths, and improved parking and traffic flow.

OBJECTIVE	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5 (THE PREFERRED)
Eliminate or reduce vehicle and pedestrian circulation problems, and include ADA access and safe pedestrian access.	Does not address this objective.	Partially addresses this objective: widens sidewalk and constructs curb along Wabash Avenue, and develops ADA-compliant path to beach.	Fully addresses this objective: develops picnic facilities near the beach with ADA-compliant paths to the beach and from parking lot, develops an ADA-compliant path from the NPS lots, and provides better traffic flow with the direct connection between the two NPS lots and the overflow lot.	Fully addresses this objective: develops picnicking facilities near the beach with ADA-compliant paths to the beach and from parking, develops an ADA-compliant path from the NPS lots, and provides better traffic flow with the direct connection between the two NPS lots and the overflow lot.	Fully addresses this objective: develops numerous picnicking facilities with ADA-compliant paths to the beach and from parking, develops an ADA-compliant path from the NPS lots, and provides better traffic flow with the new south parking lot.
Develop a formal picnic area (including a picnic shelter and platform) that provides lake views, easy access to the beach, and is ADA-compliant.	Does not address this objective.	Does not address this objective: no picnicking provided.	Fully addresses this objective: picnicking near the beach provided.	Does not address this objective: picnicking is provided but not near the beach.	Fully addresses this objective: provides for picnicking near the beach as well as adjacent two NPS parking lots.
Emphasize better visitor accommodation for existing levels of visitation; the project is not designed as an effort to increase the number of visitors.	Does not address this objective.	Partially addresses this objective: widens sidewalk and constructs curb along Wabash Avenue, develops ADA-compliant path to beach.	Fully addresses this objective: the overflow lot would only be open on summer weekends, when demand is high and visitors "orbit" the area searching for parking spaces.	Fully addresses this objective: the overflow lot would only be open on summer weekends, when demand is high and visitors "orbit" the area searching for parking spaces.	Partially meets this objective: provides for better accommodation but also allows for more visitors due to larger south parking lot.
Reduce Town maintenance costs related to erosion, facilities maintenance, and periodic sand removal.	Does not address this objective.	Fully addresses this objective: erosion problems associated with foot-wash station would be addressed. New ADA-compliant path would be developed at end of Wabash Avenue.	Fully addresses this objective: erosion problems associated with foot-wash station would be addressed. New ADA-compliant path would be developed at end of Wabash Avenue.	Fully addresses this objective: erosion problems associated with foot-wash station would be addressed. New ADA-compliant path would be developed at end of Wabash Avenue.	Fully addresses this objective: erosion problems associated with foot-wash station would be addressed. New ADA-compliant path would be developed at end of Wabash Avenue.
Improve the use and management of parking areas.	Does not address this objective.	Does not address this objective.	Fully addresses this objective: upgrades to south lot, connection between lots, overflow lot.	Fully addresses this objective: upgrades to south lot, connection between lots, overflow lot.	Fully addresses this objective: new and improved south lot with improved traffic flow, handicapped lot (north lot).

CHAPTER 3. AFFECTED ENVIRONMENT

This chapter provides brief descriptions of the resources (defined as "impact topics" in Chapter 1), that may potentially be affected by the project.

3.1 GEOLOGY AND SOILS (INCLUDING DRAINAGE ISSUES AND TOPOGRAPHY)

Soils in the Indiana Dunes National Lakeshore (national lakeshore) vary from clay-rich soils in the southern portion to sand with little clay in the dune ridges. These soils were derived from glacial deposition originating from the underlying bedrock layer consisting of limestone, dolomite, sandstone, and shale.

The East Unit of the national lakeshore is a sand plain with many dunes interspersed with areas of wetlands. Topographical relief varies almost 200 feet from the Lake Michigan shore to dune tops. The lowest elevation is at the Lake Michigan shoreline, about 585 feet above sea level, whereas Mt. Baldy, at the eastern end of the national lakeshore, is 706 feet above sea level.

Water, wind, plant and animal communities, and human activities are all elements in the geomorphology of the dunes area, but glaciation is responsible for most of the current landform and drainage patterns. Glaciers alternately retreated and advanced until about 11,000 years ago, when moraines of glacial till and outwash materials were deposited.

The silt, sand, and clay sediments found in the national lakeshore are of the Pleistocene and Holocene ages and overlie Antrim shale of Devonian age. The underlying bedrock consists of limestone, dolomite, sandstone, and shale of the Paleozoic age.

Many fluctuations and a general lowering of the water level of Lake Michigan have created as many as seven successive lake shorelines, including beach, dune, and wetland areas.

According to the 1976 Soil Survey of Porter County, Indiana (Porter 1976), there is only one soil type in the project area, dune land. This steep and very steep, deep, excessively drained map unit is on low sand dunes and beach ridges. These areas are elongated and continue in an almost unbroken line along the shore of Lake Michigan. Included in mapping are narrow bands or lake beach. Also included are small areas of stabilized sand dunes and areas on which dwellings have been built. This unit has poor potential for all uses because of the slopes and instability of the sand. Attempts have been made to stabilize some areas with beach grasses, but the low available water capacity and continuous shifting of the sands make it difficult for plants to grow. The sand moves with the winds and shifts continuously. The slopes and loose sand hinder the use of equipment (Porter 1976).

Topography on the site ranges from nearly on the Lake Michigan beach to the 40 percent slopes on the sand dune in the northeast area of the site, adjacent to the Indiana Dunes State Park (Map 10). Elevations at the site range from about 580 feet above sea level at Lake Michigan to 670 feet above sea level at the top of the dune in the northeast area.

Water drains in a generally northerly direction toward Lake Michigan. Water draining down Wabash Avenue pools at the northern end of the road. Drainage from the National Park Service (NPS) foot wash station, as well as surface drainage off Wabash Avenue, causes erosion of sand near the accessible decking on the Lake Michigan beach (**photographs 1-3**).

As explained by Mr. Steve Davis, Lake Michigan Specialist, Indiana Department of Natural Resources, Division of Water (August 24, 2011), Lake Michigan storm events, particularly in the fall, winter, and spring, can highly erode the beach. As recently as last winter, a storm resulted in 25-foot waves that eroded the beach, causing 10- to15-foot sand cliffs (**photograph 4**). Low lake levels lessened the damage that might have occurred. High lake levels in 1986 eliminated any beach, and many seawalls and groins were required to be constructed as a result. Dune-bluff erosion during the March 9, 1998, blizzard and high lake levels threatened the two houses located near the beach, just north of the current restroom building.

Photographs 1-4 courtesy of National Park Service.

During low lake levels, such as in 2003 and currently, wide beaches form, creating a deceptive appearance of safety for existing coastal structures. While wide beaches are great for recreation, they are no match for the erosive forces of Lake Michigan, especially when high lake levels are combined with massive storms that attack the shoreline and highly erodible beaches and dunes. The following photographs (**photographs 5-7**), provided by Mr. Davis, depict changes in the shoreline with changing lake levels.

NARROW BEACH --- Porter Beach – 1987 – after the 1986 'record high' lake level of 582.35'

STORM EROSION --- Porter Beach – 1998 – after the 03/09/1998 blizzard and high lake level

WIDE BEACH --- Porter Beach – 5/13/2003 – near the 1964 record low lake level of 576.05'

Photographs 5-7courtesy of Steve Davis, Indiana DNR Division of Water

MAP 10. TOPOGRAPHY

3.2 VEGETATION

Because the national lakeshore is located in several ecological transition zones, the diversity of vegetation is many times greater than most areas of similar size. Remnant species from past climatic changes have survived in sheltered habitats. The moderating effect of Lake Michigan, along with the great variety of habitats in close proximity, explains much of the plant diversity (NPS 2007). The national lakeshore has a remarkably rich flora. NPSpecies data indicate 1,501 species of vascular plants have been identified (NPS 2011c). There are 1,196 species of native plants and 304 non-native plant species within the national lakeshore's boundaries. Many of these non-natives are invasive and, once established, can severely alter natural succession (NPS 1997a). The national lakeshore is home to populations of thirty percent of Indiana's listed endangered, threatened, and rare plant species. Shaped by glacial events and changing climates, the dunes landscape contains disjunct flora representative of eastern deciduous forests, boreal forest remnants, and species with Atlantic coast affinities. In addition, the national lakeshore is part of the uppermost and easternmost limits of the tallgrass prairie peninsula and supports high-quality remnants of this ever-diminishing vegetation type. The presence of many unique dune and wetland plant community types has led to a long history of botanical exploration and research.

Because no project-specific inventory of vegetation had been conducted at the site, the NPS retained the services of a contractor to conduct such inventory. Based on this inventory conducted in August 2012, four land cover types were identified: beach/foredune community, dry sand prairie community, heavily degraded/no natural community identity, and developed/structures.

Within the beach/foredune community, high-quality areas of foredune are present (Map 11). These high-quality foredune areas are dominated by marram grass (Ammophila breviligulata, state watch list) and sand reed (Calamovilfa longifolia var. magna). Also present in this area are dwarf fragrant sumac (Rhus aromatica var. arenaria, state rare) and dune goldenrod (Solidago racemosa var. gillmanii, state threatened). The invasive Siberian elm (Ulmus pumila) is also present. This community is bisected by active foot trails.

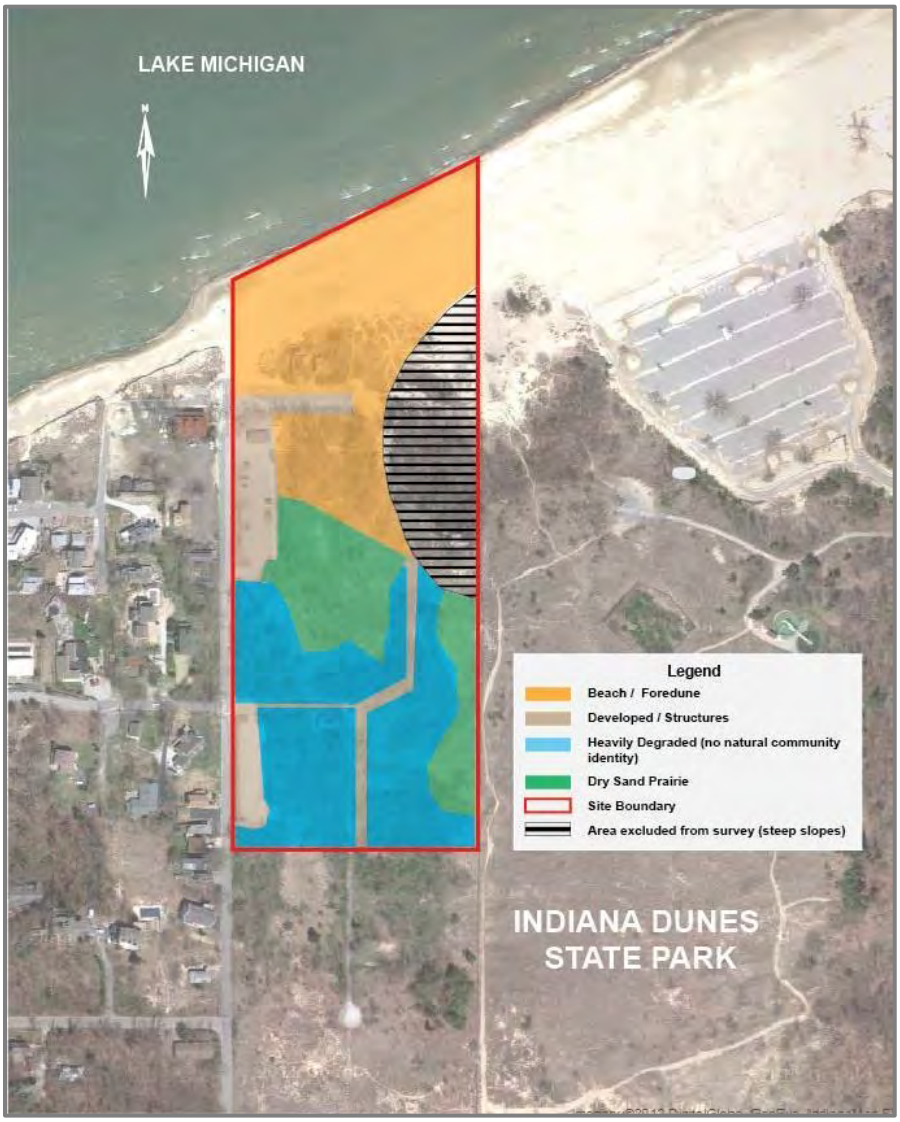
Two areas of high-quality dry sand prairie community are found on the site. One area is dominated by little bluestem (Andropogon scoparius) and sand reed, with multiple populations of dwarf fragrant sumac. Non-native trees such as black locust (Robinia pseudoacacia) and Lombardy poplar (Populus nigra "Italica") are encroaching in this area. The other area is dominated by little bluestem, sand reed, and marram grass, with some occurrences of dwarf fragrant sumac.

The remainder of the site (heavily degraded foredune and heavily degraded woods) is considered low-quality in terms of natural areas, since it has been disturbed by past activities.

There are no federally endangered or threatened plant species present on the site. Three plant species on the Indiana list of endangered, threatened, and rare species are present: Jack pine (*Pinus banksiana*, state rare), dwarf fragrant sumac, and dune goldenrod. Jack pine only occurs in the NPS-developed planting beds around the north parking lot.

A number of other plant species were identified during the August 2012 inventory. These are listed in the report attached as Appendix A. This vegetation inventory should not be considered exhaustive, due to the time of year in which it was conducted. For a complete vegetation inventory, field surveys would need to be conducted at various times throughout the year.

MAP 11. VEGETATION IN THE PROJECT AREA



3.3 WILDLIFE

The national lakeshore is home to not only a diverse population of plants, but also a diverse wildlife population. Forty-six species of mammals, 15 species of amphibians, 22 species of reptiles, 71 species of fish, 60 species of butterflies, and 60 species of dragonflies and damselflies are present. This biological diversity is one of the most significant features of the national lakeshore, and a primary reason for its establishment. Because the national lakeshore is located in several ecological transition zones, the wildlife diversity is many times greater than most areas of similar size. Remnant species from past climatic changes have survived in sheltered habitats. The moderating effect of Lake Michigan, along with the great variety of habitats in close proximity, explains much of the plant and animal diversity (NPS 2007).

More than 350 species of birds have been identified in the area along the entire southern shore of Lake Michigan (Brock 1997), with 113 of these being regular nesters. The national lakeshore also provides

habitat for feeding great blue herons and ideal nesting habitat for the heron. Due to maturing forests, the pileated woodpecker is making a comeback in the national lakeshore and the red-shouldered hawk, though a state species of concern, is nesting in good numbers. Sandhill cranes and great egrets have begun nesting in the area in the last three years due to wetland restoration efforts. Common resident species include mallard, blue jay, American crow, great horned owl, song sparrow, ring-billed gull, house finch, and northern cardinal. Summer breeding species include pied-billed grebe, red-shouldered hawk, sora, Acadian flycatcher, yellow-billed cuckoo, and chestnut-sided warbler.

The national lakeshore is also a focal point for migrating avian species. Spring and fall migrants include numerous wildfowl species, olive-sided flycatcher, Swainson's thrush, solitary vireo, Cape May warbler, bay-breasted warbler, and many other species.

During spring, the Lake Michigan shoreline channels numerous migrating raptor species through the East Unit, along the dune ridge tops. About a dozen raptor species, including red-tailed hawk, bald eagles, peregrine falcons, sharp-shinned hawks, American kestrels, and turkey vultures, take advantage of uplifting south breezes on their northward journey. Thousands of migrating raptors and sandhill cranes have been identified and are counted annually by volunteer birdwatchers.

Most mammals have relatively stable populations. They include white-tailed deer, woodchuck, coyote, red fox, red squirrel, eastern gray squirrel, beaver, striped skunk, eastern chipmunk, muskrat, meadow vole, eastern cottontail, and white-footed mouse. High white-tailed deer populations are a concern, however, and the national lakeshore completed a *Deer Management Plan/Environmental Impact Statement* in 2012 to address this issue.

Because no project-specific wildlife inventory had been conducted at the site, the NPS retained the services of a contractor to conduct such inventory. Based on this inventory conducted in August 2012 in conjunction with the vegetation inventory described above, the following wildlife species were observed (Table 5):

TABLE 5. WILDLIFE OBSERVATIONS (2012)

SCIENTIFIC NAME	COMMON NAME
BIRDS	
Archilochus colubris	Ruby-throated Hummingbird
Baeolophus bicolor	Tufted Titmouse
Cardinalis cardinalis	Northern Cardinal
Carduelis tristis	American Goldfinch
Carpodacus mexicanus	House Finch
Corvus brachyrhynchos	American Crow
Cyanocitta cristata	Blue Jay
Dumetella carolinensis	Gray Catbird
Hirundo rustica	Barn Swallow
Larus argentatus	Herring Gull
Larus delawarensis	Ring-billed Gull
Picoides pubescens	Downy Woodpecker
Pipilo erythrophthalmus	Eastern Towhee
Poecile atricapillus	Black-capped Chickadee

SCIENTIFIC NAME	COMMON NAME
BIRDS	
Polioptila caerulea	Blue-gray Gnatcatcher
Progne subis	Purple Martin
Scolopax minor	American Woodcock
Sitta carolinensis	White-breasted Nuthatch
Spizella pusilla	Field Sparrow
Troglodytes aedon	House Wren
Zenaida macroura	Mourning Dove
INSECTS / SPIDERS	
Bombus sp.	Unidentifiable bumblebee
Epargyreus clarus	Silver-spotted Skipper
Libellula lactuosa	Widow Skimmer
Phyciodes tharos	Pearl Crescent
Pieris rapae	Cabbage White
Polygonia interrogationis	Question Mark
Sphecius speciosus	Cicada Killer
Sympetrum sp.	Unidentifiable meadowhawk
Tabanus sp.	Unidentifiable horsefly
	Unidentifiable cicada
	Unidentifiable mantid
MAMMALS	
Odocoileus virginianus	White-tailed Deer
Sylvilagus floridanus	Eastern Cottontail
REPTILES	
Cnemidophorus sexlineatus	Six-lined Racerunner

3.4 VISITOR USE AND EXPERIENCE

Roughly two million visitors come to the national lakeshore annually, with the majority of the visitation in the summer months. A variety of recreational opportunities are offered, such as bird watching, picnicking, swimming, hiking, horseback riding, camping, fishing and boating, bicycling, special events, and winter activities (e.g., hiking, cross-country skiing, and snowshoeing) (NPS 2011d). The *Indiana Dunes National Lakeshore Visitor Study* (NPS 2010) describes the results of a visitor survey conducted at the national lakeshore from August 1-14, 2009. The most common sites visited within the national lakeshore were Mt. Baldy (38 percent) followed by the beach in the central part of the park (37 percent). Beach activities were the most common visitor activity (79 percent) followed by walking/hiking (51 percent). United States visitors made up 98 percent of total visitation during the survey period, with 40 percent from Indiana, 40 percent from Illinois, and smaller proportions from 27 other states. International visitors were from seven countries and made up 2 percent of total visitation. Among visitors that visited other places in the surrounding area (from Gary, Indiana, to Michigan City, Indiana), 42 percent of visitor

groups visited Indiana Dunes State Park (state park). Of those using trails during their visit, 55 percent used Mt. Baldy and 45 percent used a variety of other trails.

Vehicle traffic counts at the two parking lots provide an estimate of annual visitor use (Table 6). Based on 2011 traffic counts, 279,610 people visited the site, with nearly 200,000 visitors in the three summer months. This visitation level may be skewed, however, due to vehicles continually driving through the site ("orbiting," as one ranger put it), until a parking space can be found. No formal visitor use studies have been conducted for the site. On summer weekends, the parking spaces typically are full by 10:00 a.m. Since no parking is permitted or physically feasible along Waverly Road and Wabash Avenue, the only available parking is at the two NPS parking lots, the Town of Porter permit lot, or in privately-owned areas, such as the Johnson's Inn lot. A very few visitors access the site by bicycle.

Visitors come to the site for the beach and typically stay for the day, bringing coolers (alcohol is not permitted), chairs, and other beach gear. Some visitors walk along the beach, to the west and east, since the beach area is not fenced. The state park beach is life-guarded and no alcohol is allowed.

Anecdotal evidence suggests that visitors are generally pleased with their beach experience, once a parking space is secured. Other concerns expressed by visitors include the lack of accessibility, no picnicking areas, safety along Wabash Avenue, and damage to the dunes.

TABLE 6. VISITOR USE AT PORTER BEACH (2007-2011)

	2007	2008	2009	2010	2011
June	63,618	31,630	70,956	71,167	62,310
July	55,983	95,515	99,302	88,887	81,133
August	50,945	61,529	76,926	80,969	54,480
3-month Total	170,546	188,674	247,184	241,023	197,923
Yearly Total	277,307	268,398	332,082	374,731	279,610

3.5 PARK FACILITIES AND OPERATIONS

Existing NPS facilities at the site include two parking areas with a total capacity of 72 vehicles, a modern restroom, a bicycle rack, and accessible decking ("Superdeck") to the beach.

The north paved parking area with curbs can accommodate about 30 parking spaces. Solar-powered street lights provide lighting for the parking lot. No drainage facilities are present within the parking lot to manage storm water. No signs require one-way operation within the parking lot, but the north access has a limited width of 12 feet. A sidewalk on the east side of the parking lot provides a pedestrian path to the restroom. Wooden gates (south end) and cables (north end) are used to close the parking lot 30 minutes after dusk. A second parking area is located south of the Duneland Drive and Wabash Avenue intersection and accommodates about 42 vehicles. Bumper blocks are used to designate parking spaces in the gravel lot. Traffic is directed to circulate in a one-way pattern by posting "Do Not Enter" signs at the north access to Duneland Drive. Wood gates are used to close the parking area 30 minutes after dusk

The restroom contains typical restroom facilities, changing facilities, benches, and a foot-wash station. The septic system for the restrooms was designed to accommodate a higher volume of wastewater than currently needed.

The national lakeshore's maintenance division spends about $18,000 annually and 0.4 full-time equivalent employees to maintain the site. No cost or labor data are available for other park divisions.

3.6 ADJACENT LANDOWNERS

The NPS has purchased thousands of tracts of land in establishing the national lakeshore, but in many cases, the local governments retain ownership of public lands and roads in and around the federally-owned tracts. As a result, there are a number of developed streets in the project area that are owned in fee simple title (not rights-of-way) by the Town of Porter (Town), including Wabash Avenue, which is the west boundary of the project area, Johnson Beach Road (127th Avenue), Duneland Drive, and Dabbert Drive. In addition, there are platted but undeveloped streets and alleys throughout the site that are also owned by the Town in fee simple title (Map 4). North-south-running streets have a 50-foot-wide ownership, east-west-running streets have a 60-foot-wide ownership, and alleys have a 15-foot-wide ownership. Johnson Beach Road serves as a paved permit parking area for approximately 25 vehicles. Permits are available to Town residents for $25/year, Indiana residents for $50/year, and to non-residents for $85/year. Permits allow parking in the lot based on availability, as many more permits are sold than spaces are available.

The State of Indiana's information that the area below the Ordinary High Water Mark is public beach can be found on the state's website at www.state.in.us/nrc_dnr/lakemichigan/recacc/recaccb.html:

"A public beach in Indiana includes the portion of the Indiana Lake Michigan coastline lying lakeward of the ordinary high water mark, as well as those held in parks or other public ownership. The presence of a wide diversity of natural physical shoreline characteristics practically renders a physical description of the term beach meaningless."

There are roughly 70 residences located just west of the project area, with Wabash Avenue providing the only principal access for them (Map 3). Due to heavy traffic on Wabash Avenue, particularly on summer weekends, these adjacent residents sometimes find it hard to exit their homes. Some residents have complained about beach use in front of their homes, as well as littering and theft. One residence, the Johnson's Inn on the corner of Johnson Beach Road and Wabash Avenue, provides a private parking area for beach users at a cost of $20-25/day.

The 2,182-acre Indiana Dunes State Park lies adjacent to the site on the east side, and the boundary is fenced (Map 3). The state park charges a $5/day resident and $10/day non-resident entrance fee and has had a yearly visitation of roughly 1.1 million visitors for each of the past two years. The three parking lots (West Lot, Pavilion Lot, and Auxiliary Lot) have a total capacity of over 1,000 vehicles, and the state park fills these lots nearly every summer weekend day. Often spaces in these lots turn over two to three times per weekend day. According to the state park manager, there are a significant number of people who enter the state park illegally from Porter Beach, since the beach boundary is not fenced. The Bird Observation Platform (near the NPS boundary), owned by the state park, is almost complete, and the state park is planning to convert the beach pavilion to a year-round restaurant and conference facility (personal communication with state park manager). Other state park facilities include a campground, nature center, and hiking trails. The state park also cooperates with the Porter County Tourism Bureau and the National Park Service to staff the visitor center at the junctions of highways US-20 and US-49. The Dunes Prairie Nature Preserve, an area within the state park, is located just southeast of the project area.

3.7 TRAFFIC PATTERNS AND VOLUME

Passengers often are dropped off in the cul-de-sac area nearest the beach, and the driver circulates the parking lots to find an available space. This "orbiting" results in queues extending from the parking areas to Waverly Road, with queue lengths of 0.5 miles or more on summer weekends. Demand for parking exceeds the available parking spaces during most summer weekends. Available parking limits visitation to the beach.

On overflow days (roughly 25 per year based on observations), the Town dispatches police to clear congestion. Due to the width of Wabash Avenue (18-20 feet) and the number of vehicles and pedestrians using this street, emergency vehicles have had difficulty accessing the residential area or the beach. Large vehicles, such as motorhomes, have been observed accessing the site and have had difficulty turning around at the end of the street.

3.8 AIR QUALITY

Section 118 of the 1963 Clean Air Act (42 U.S.C. 7401 et seq.) requires a national park system unit to meet all federal, state, and local air pollution standards. The national lakeshore is a Class II air quality area under the Clean Air Act, as amended. A Class II designation 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.

Construction activities, including equipment operation and the hauling of material, could result in temporarily increased vehicle exhaust and emissions, as well as inhalable particulate matter. Construction dust associated with exposed soils would be controlled, if necessary, with the application of water or other approved dust palliatives. In addition, any hydrocarbons, nitrogen dioxide, sulfur dioxide emissions, as well as airborne particulates created by fugitive dust plumes, would be rapidly dissipated because the location of the park and prevailing winds that allow for good air circulation. However, changes in vehicle circulation could affect exhaust emissions.

Due to frequent traffic backups, residents have complained of exhaust fumes from idling vehicles. The relative changes in the amount of exhaust fumes under each alternative will be discussed in Chapter 4, "Environmental Consequences."

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

A determination of the probable impacts of each alternative on Indiana Dunes National Lakeshore (national lakeshore) resources has been made in accordance with the National Environmental Policy Act. The analysis for each impact topic includes the identification of impacts of the various actions comprising the alternative, characterization of the impacts, an assessment of cumulative impacts, and a conclusion.

In addition to determining the environmental consequences of the alternatives, National Park Service (NPS) *Management Policies 2006* and Director's Order #12 require an analysis of potential effects to determine if actions would impair park resources.

4.1. METHODOLOGY

For each impact topic, the analysis includes an evaluation of effects resulting from implementation of each alternative discussed in Chapter 2. The impact analyses were based on professional judgment using information provided by national lakeshore staff, relevant references and technical literature citations, and subject matter experts. Evaluation of alternatives takes into account whether the impacts would be negligible, minor, moderate, or major. These thresholds are defined for each impact topic.

Duration of impact is evaluated based on the approximate length of time an impact of an alternative would affect existing conditions, denoted as either short-term or long-term. Type of impact refers to the beneficial versus adverse consequences of implementing a given alternative. More exact interpretations of intensity, duration, and type of impact are given for each impact topic examined.

4.2 CUMULATIVE IMPACTS

The Council on Environmental Quality regulations for implementing the National Environmental Policy Act (Council on Environmental Quality, 1978) and NPS Director's Order #12 *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001) require assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are considered for both the "No Action" and action alternatives.

Cumulative impacts were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions at the national lakeshore and in the surrounding region. These include actions by the NPS as well as other entities such as Indiana Dunes State Park, the Town of Porter, and private residents. These actions, in conjunction with this project, are intended to preserve and restore natural resources and to improve visitor experience. The actions and developments include:

- A *Shoreline Restoration and Management Plan/Environmental Impact Statement* is currently underway for the national lakeshore's 13 miles of the southern Lake Michigan Shoreline. Development and installation of navigational harbors and shoreline stabilization structures (e.g., jetties, breakwaters, revetments, and bulkheads) has altered southern Lake Michigan's natural east to west littoral drift, resulting in significant accretion of sands east (up drift) of Michigan City and Burns International harbors, and the subsequent sand starvation to the west (down drift) of these harbors. The lack of continued sand replenishment from natural littoral drift has further resulted in extensive beach and dune erosion, threatening both public and private resources.

- NPS developments at the site during the past ten years, including constructing modern restrooms, improving the parking areas, constructing native plant beds, and creating accessible walkways between Wabash Avenue and the beach.
- The Town of Porter operates the Johnson Beach Road paved permit parking lot that provides parking for approximately 25 vehicles.
- Indiana Dunes is completing a Bird Observation Platform near the NPS boundary and plans to convert the beach pavilion to a year-round restaurant and conference facility. The three state park parking lots have a total capacity of over 1,000 vehicles and are full almost every summer weekend day.
- The privately-owned Johnson's Inn provides a private parking area for beach users.

4.3 GEOLOGY AND SOILS

Intensity

Negligible: Soils would not be affected, or the effects to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight. Changes in drainage characteristics, including water flow, soils, and topography, within the project area would not be detectable using standard measurement techniques.

Minor: The effects to soils would be detectable. Effects to soil productivity or fertility would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful. Changes in drainage characteristics within the project area would be detectable but would have a local and temporary impact. Mitigation could possibly be required to offset adverse impacts and would be relatively simple to implement (e.g., increasing culvert size, configuration, or placement).

Moderate: The effect on soil productivity or fertility would be readily apparent and would result in a change to the soil character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful. Changes in drainage characteristics within the project area would be detectable, would impact a large area, and could result in some localized flooding during rain events. Mitigation measures would be necessary to offset adverse impacts and would likely be successful.

Major: The effect on soil productivity or fertility would be readily apparent and would substantially change the character of the soils over a large area in and outside of the national lakeshore. Mitigation measures to offset adverse effects would be necessary and extensive, and their success could not be guaranteed. Changes in drainage characteristics within the project area would be readily apparent and widespread, and could result in increased flooding during rain events.

Duration

Short-term: Recovers in less than three years.

Long-term: Takes more than three years to recover.

Impacts to Geology and Soils by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. There would continue to be long-term, minor, and adverse impacts to geology and soils from social trails, drainage problems, wind-blown sand, and beach erosion during storm events.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils under the No Action Alternative. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of the No Action Alternative would result in long-term, minor, and adverse impacts to geology and soils.

Impacts to Geology and Soils by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Some long-term, minor, and adverse impacts to the dune near the end of Wabash Avenue would occur due to placement of a path that is compliant with the Americans with Disabilities Act of 1990 (ADA). The south parking lot would be upgraded within the existing footprint. No impacts to geology and soils would occur as a result of this work.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils under Alternative 2. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of Alternative 2 would result in long-term, minor, and adverse impacts to geology and soils.

Impacts to Geology and Soils by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue. This connection would bisect an area of considerable relief, and cut and fill would be required. Five-foot-wide bike lanes would be constructed along Wabash Avenue, limited to the project area, if approved by the Town of Porter (Town), to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. Widening Wabash Avenue would occur in previously disturbed areas. A picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. The facility could be located on the disturbed foredune (previous house sites) to reduce impacts to soils and topography. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach. Some minor impacts to soils and topography would occur to meet required grades for these facilities. The south parking lot would be upgraded within the existing footprint. No impacts to geology and soils would occur as a result of this work. An overflow parking lot would be constructed on previously disturbed land, for use on busy summer weekends, resulting in no new impact to soils and topography. This lot would be constructed of gravel or some other permeable surface to

eliminate runoff and possible erosion. Impacts to geology and soils would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils under Alternative 3. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of the Alternative 3 would result in long-term, minor, and adverse impacts to geology and soils.

Impacts to Geology and Soils by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue. This connection would use previously existing transportation corridors to the extent possible to reduce potential impacts to geology and soils; however, some grading would be required. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots on previously disturbed areas. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities, and some impact would occur to meet grade requirements. The south parking lot would be upgraded within the existing footprint. No impacts to geology and soils would occur as a result of this work. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, resulting in no new impacts to soils and topography; it would be constructed of gravel or some other permeable surface to eliminate runoff and possible erosion. Alternatively, this overflow lot could be constructed along the loop connector. The sidewalk along Wabash Avenue would be raised, widened, and curbed in a previously disturbed area to provide for greater pedestrian safety. Impacts to geology and soils would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils under Alternative 4. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of the Alternative 4 would result in long-term, minor, and adverse impacts to geology and soils.

Impacts to Geology and Soils by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would also provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive, in a previously disturbed area. Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots in previously disturbed areas. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic facilities to the beach, and some impact to geology and soils would occur to meet grade requirements. Impacts to geology and soils would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils under Alternative 5. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of the Alternative 5 would result in long-term, minor, and adverse impacts to geology and soils.

Impacts to Geology and Soils by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Impacts to geology and soils from foot-wash station improvements and dune restoration would be long-term, minor, and beneficial. Short-term, negligible, adverse impacts would result from placing interpretive wayside exhibits. There would be no impact to geology and soils in the project area from developing the advance warning sign system.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to geology and soils. The *Shoreline Restoration and Management Plan/Environmental Impact Statement* may identify actions that may be taken to reduce the impact of beach erosion, but the level of this impact is unknown.

Conclusions: Implementation of the actions common to all action alternatives would result in long-term, minor, and beneficial impacts to geology and soils.

4.4 VEGETATION

Intensity

Negligible: No native vegetation would be affected, or some individual native plants could be affected on a small scale as a result of the alternative, but there would be no effect on native species populations. Special concern species would not be affected, or the effects would be at or below the level of detection and would not be measurable or of perceptible consequence to these species.

Minor: The alternative would temporarily affect some individual native plants and would also affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective. Effects on special concern species or habitats would be measurable or perceptible, but localized within a small area. While the mortality of individual species could occur, the viability of populations would not be affected, and the community, if left alone, would recover.

Moderate: The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected. Changes in special concern populations or habitats would occur over a relatively large area. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. Mitigation measures would be necessary to offset adverse effects on special concern species, and would likely be successful.

Major: The alternative would have a considerable long-term effect on native plant populations, including species of special concern, and would affect a relatively large area in and outside of the national lakeshore. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed. Effects on populations or habitats would be readily apparent and would substantially change populations over a large area in and outside of the national lakeshore. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.

Duration

Short-term: Following treatment, recovery would take less than two years.

Long-term: Following treatment, recovery would take more than two years.

Impacts to Vegetation by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. However, some long-term, minor, and adverse impacts to vegetation would occur from continued trampling on social trails, especially in areas of steep slopes.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation under the No Action Alternative.

Conclusions: Implementation of the No Action Alternative would result in long-term, minor, and adverse impacts to vegetation.

Impacts to Vegetation by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Some impacts to the dune and native dune grass near the end of Wabash Avenue would occur due to placement of an ADA-compliant path. Impacts to vegetation would be long-term, minor, and adverse. The south parking lot would be upgraded within the existing footprint. No impacts to vegetation would occur as a result of this work.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in long-term, minor, and adverse impacts to vegetation.

Impacts to Vegetation by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue. This connection would bisect an area of degraded woods, avoiding the high-quality dry sand prairie. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. Widening Wabash Avenue would occur in previously disturbed areas. A picnic facility (group or

individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. The facility could be located on the disturbed foredune (previous house sites) to reduce impacts to the high-quality foredune vegetation. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach. Some minor impacts to vegetation (principally marram grass) would occur to meet required grades for these paths, and efforts would be made to avoid impacting the state threatened dune goldenrod when placing them. The south parking lot would be upgraded within the existing footprint. No impacts to vegetation would occur as a result of this work. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, resulting in no new impact to vegetation. Impacts to vegetation would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation under Alternative 3.

Conclusions: Implementation of the Alternative 3 would result in long-term, minor, and adverse impacts to vegetation.

Impacts to Vegetation by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue. This connection would use previously existing transportation corridors to the extent possible to reduce potential impacts to vegetation and would avoid, to the extent possible, the high-quality dry prairie area. However, some grading would be required. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots in degraded and disturbed areas. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities. Some minor impacts to vegetation (principally marram grass) would occur to meet required grades for these picnic facilities and paths near the end of Wabash Avenue. The south parking lot would be upgraded within the existing footprint. No impacts to vegetation would occur as a result of this work. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, resulting in no new impact to vegetation. Alternatively, this overflow lot could be constructed along the loop connector. Impacts to vegetation would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation under Alternative 4.

Conclusions: Implementation of the Alternative 4 would result in long-term, minor, and adverse impacts to vegetation.

Impacts to Vegetation by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would also provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive, in a previously disturbed area. Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots in previously disturbed areas. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic

facilities to the beach, and some vegetation would be removed to develop them. Impacts to vegetation would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation under Alternative 5.

Conclusions: Implementation of the Alternative 5 would result in long-term, minor, and adverse impacts to vegetation.

Impacts to Vegetation by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Impacts to vegetation from these activities would be short-term, negligible, and adverse, and in the long-term, minor and beneficial. Short-term, negligible, adverse impacts would result from placing interpretive wayside exhibits. There would be no impact to vegetation in the project area from developing the advance warning sign system.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to vegetation.

Conclusions: Implementation of the actions common to all action alternatives would result in short-term, negligible, and adverse and long-term, minor, and beneficial impacts to vegetation.

4.5 WILDLIFE

Intensity

Negligible: Any effects to wildlife would be at or below the level of detection, site-specific, and so slight that they would not be of any measurable or perceptible consequence to the wildlife populations. Special concern species would not be affected, or the effects would be at or below the level of detection and would not be measurable or of perceptible consequence to these species.

Minor: Effects to wildlife would be detectable, site-specific, small, and of little consequence to the wildlife populations. Mitigation measures, if needed to offset adverse impacts, would be simple and successful. Effects on special concern species or habitats would be measurable or perceptible, but localized within a small area. While the mortality of individual species might occur, the viability of populations would not be affected, and the community, if left alone, would recover.

Moderate: Effects to wildlife would be readily detectable and site-specific, with consequences at the population level. Mitigation measures, if needed to offset adverse impacts, would be extensive and likely successful. A change in populations or habitats, including for special concern species, would occur over a relatively large area. The change would be readily measurable in terms of abundance, distribution, quantity, or quality of population. Mitigation measures would be necessary to offset adverse effects, and would likely be successful.

Major: Effects to wildlife would be obvious and either local or regional, and would have substantial consequences to wildlife populations in the area. Extensive mitigation measures would be needed to offset any adverse impacts, and their success would not be guaranteed. Effects on populations or habitats, including for special concern species, would be readily apparent, and would substantially change

populations over a large area in and outside of the national lakeshore. Extensive mitigation would be needed to offset adverse effects, and the success of mitigation measures could not be assured.

Duration

Short-term: Following treatment, recovery would take less than two years.

Long-term: Following treatment, recovery would take more than two years.

Impacts to Wildlife by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. However, some long-term, minor, and adverse impacts to wildlife would occur from continued trampling on social trails, resulting in habitat destruction, especially in areas of steep slopes.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife.

Conclusions: Implementation of the No Action Alternative would result in long-term, minor, and adverse impacts to wildlife.

Impacts to Wildlife by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Impacts to wildlife would be short-term, negligible, and adverse. The south parking lot would be upgraded within the existing footprint. No impacts to wildlife would occur as a result of this work.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in short-term, negligible, and adverse impacts to wildlife.

Impacts to Wildlife by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue. This connection would bisect an area of degraded woods and could displace some of the common wildlife species listed in Chapter 3. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. Widening Wabash Avenue would occur in previously disturbed areas with little wildlife. A picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. The facility could be located on the disturbed foredune (previous house sites), with little impact to wildlife species inhabiting that area. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach. Some displacement of wildlife would occur to meet required grades for these facilities. The south parking lot would be upgraded within the existing footprint. No impacts to wildlife would occur as a result of this work. An overflow parking lot

would be constructed on previously disturbed land for use on busy summer weekends, resulting in negligible impact to wildlife. Impacts to wildlife would be short-term, negligible, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife under Alternative 3.

Conclusions: Implementation of the Alternative 3 would result in short-term, negligible, and adverse impacts to wildlife.

Impacts to Wildlife by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue. This connection would use previously existing transportation corridors to the extent possible to reduce potential impacts to wildlife. However, some grading would be required. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots in degraded and disturbed areas. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities. Some displacement of wildlife would occur to meet required grades for these facilities. The south parking lot would be upgraded within the existing footprint. No impacts to wildlife would occur as a result of this work. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, resulting in no negligible impact to wildlife. Alternatively, this overflow lot could be constructed along the loop connector. Impacts to wildlife would be short-term, negligible, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife.

Conclusions: Implementation of the Alternative 4 would result in short-term, negligible, and adverse impacts to wildlife.

Impacts to Wildlife by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would also provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive, in a previously disturbed area. Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots in previously disturbed areas. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic facilities to the beach. Most of these actions would occur on previously-disturbed areas with poor wildlife habitat. Some minor displacement of smaller wildlife may occur during construction activities. Impacts to wildlife would be short-term, negligible, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife under Alternative 5.

Conclusions: Implementation of the Alternative 5 would result in short-term, negligible, and adverse impacts to wildlife.

Impacts to Wildlife by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Impacts to wildlife from these activities would be short-term, negligible, and adverse. Long-term, minor, beneficial impacts to wildlife would occur from dune restoration and improved habitat. There would be no impact to wildlife in the project area from developing the advance warning sign system.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to wildlife.

Conclusions: Implementation of actions common to all action alternatives would result in short-term, negligible, and adverse and long-term, negligible, and beneficial impacts to wildlife.

4.6 VISITOR USE AND EXPERIENCE

Intensity

Negligible: Visitors would not be affected, or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor use and/or experience would be detectable. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor use and/or experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.

Major: Changes in visitor use and/or experience would be readily apparent and have important consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.

Duration

Short-term: Occurs only during proposed implementation activities.

Long-term: Occurs after proposed implementation activities.

Impacts to Visitor Use and Experience by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. However, some long-term, minor, and adverse impacts would occur to visitors due to unsafe pedestrian access along Wabash Avenue, traffic congestion problems, little available shade and no formal picnic facilities, and the beach access not being universally accessible.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience under the No Action Alternative.

Conclusions: Implementation of the No Action Alternative would result in long-term, minor, and adverse impacts to visitor use and experience.

Impacts to Visitor Use and Experience by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Impacts to visitor use and experience would be long-term, minor, and beneficial. The south parking lot would be upgraded within the existing footprint. No impacts to visitors would occur as a result of this work, since it would be conducted in low-use periods.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in long-term, minor, and beneficial impacts to visitors.

Impacts to Visitor Use and Experience by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. Reduced traffic and idling would reduce exhaust emissions and associated noxious odors. This connection would also allow visitors using the parking lots to access the beach without walking along Wabash Avenue. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. Visitors would benefit by having safer bicycling opportunities and a more timely response should an emergency situation arise. An ADA-accessible picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach, providing visitors with the only one of its kind in the East Unit of the national lakeshore. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. No impacts to visitors would occur as a result of this work, since it would be conducted in low-use periods. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. The availability of overflow parking could have both beneficial and adverse effects. Additional parking opportunities would be available for visitors on busy summer weekends; however, visitors expecting parking opportunities because of this lot may be dismayed if the lot is full and no nearby parking opportunities are available. Impacts to visitor use and experience would be long-term, moderate, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience under Alternative 3.

Conclusions: Implementation of Alternative 3 would result in long-term, moderate, and beneficial impacts to visitor use and experience.

Impacts to Visitor Use and Experience by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. Reduced traffic and idling would reduce exhaust emissions and associated noxious odors. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. Picnicking near the parking lots would be convenient, reducing the distance to carry picnic supplies, but would not provide lake views and breezes as in Alternative 3. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. No impacts to visitors would occur as a result of this work, since it would be conducted in low-use periods. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. Alternatively, this overflow lot could be constructed along the loop connector. The availability of overflow parking could have both beneficial and adverse effects. Additional parking opportunities would be available for visitors on busy summer weekends; however, visitors expecting parking opportunities because of this lot may be dismayed if the lot is full and no nearby parking opportunities are available. Impacts to visitor use and experience would be long-term, moderate, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience under Alternative 4.

Conclusions: Implementation of Alternative 4 would result in long-term, moderate, and beneficial impacts to visitor use and experience.

Impacts to Visitor Use and Experience by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. Entrance to this parking lot would be from Wabash Avenue, and vehicles would be notified that this new parking lot is the *only* general parking available. When the parking lot is full, it would be closed and vehicles would make the short loop back to Wabash Avenue, then be required to turn left (southbound), away from the beach. Vehicles parked in this new parking lot would also be required to turn left (southbound) on Wabash Avenue when exiting. The existing north lot would be open only during summer months to visitors with valid handicapped placards. In the off-season, the new south parking lot would be closed, and all visitors would use the north parking lot. Adjacent residents and vehicles with valid Town parking permits would have access north on Wabash Avenue. Reduced traffic and idling on Wabash Avenue would reduce exhaust emissions and associated noxious odors. This alternative would offer increased opportunities for visitors to use the beach (due to more parking and ADA-compliant paths) and provide for a less confusing method of parking. The increased availability of parking could have both beneficial and adverse effects. Since parking is the limiting factor for beach use, more available parking will result in more opportunities for visitors to use the beach. However, increased use may also result in crowding and associated conflicts. Also, visitors expecting parking opportunities because of this larger parking lot may be dismayed if the lot is full and no nearby parking opportunities are available.

Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic facilities to the beach. These developments would provide a variety of picnicking and access opportunities not currently afforded at the site. Impacts to visitor use and experience would be long-term, moderate, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience under Alternative 5.

Conclusions: Implementation of Alternative 5 would result in long-term, moderate, and beneficial impacts to visitor use and experience.

Impacts to Visitor Use and Experience by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Options for developing an advanced traffic warning sign system would also be evaluated. As a result, impacts to visitors would be long-term, minor, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to visitor use and experience.

Conclusions: Implementation of actions common to all alternatives would result in long-term, minor, and beneficial impacts to visitor use and experience.

4.7 NATIONAL LAKESHORE FACILITIES AND OPERATIONS

Intensity

Negligible: National lakeshore operations would not be affected, or the effect would be at or below the lower levels of detection and would not have an appreciable effect on national lakeshore operations.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on national lakeshore operations. If mitigation were needed to offset adverse effects, it would be relatively simple and would likely be successful.

Moderate: The effects would be readily apparent, and would result in a substantial change in national lakeshore operations in a manner noticeable to staff and the public. Mitigation measures would probably offset adverse effects and would likely be successful.

Major: The effects would be readily apparent, would result in a substantial change in national lakeshore operations in a manner noticeable to staff and the public, and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be necessary and extensive, and their success could not be guaranteed.

Duration

Short-term: Effects occur only during proposed implementation activities.

Long-term: Effects persist beyond the period of implementation activities.

Impacts to National Lakeshore Facilities and Operations by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. Impacts on national lakeshore facilities would continue to be long-term, minor, and beneficial. Impacts on national lakeshore operations would continue to be long-term, minor, and adverse due to staff time to manage the site.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations under the No Action Alternative.

Conclusions: Implementation of the No Action Alternative would result in long-term, minor, and beneficial impacts to national lakeshore facilities and long-term, minor, and adverse impacts to operations.

Impacts to National Lakeshore Facilities and Operations by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Good design of ADA-compliant paths would require less maintenance for sand removal. However, additional maintenance efforts would be required to construct and maintain the ADA-compliant paths. The south parking lot would be upgraded within the existing footprint. Some short-term increased maintenance efforts would be required (if the work was done in-house), but in the long-term, impacts to park facilities and operations would be minor and beneficial.

The current annual national lakeshore maintenance labor directed to this site is 0.4 full-time equivalent (FTE) employees, at a cost of $18,000. Labor and costs for maintenance would likely increase slightly under this alternative due to erosion work. No current labor or cost figures are available for other national lakeshore divisions, but they likely would increase slightly. The overall impact to national lakeshore facilities and operations from Alternative 2 would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in long-term, minor, and adverse impacts to national lakeshore facilities and operations.

Impacts to National Lakeshore Facilities and Operations by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. Once constructed, this connection would be maintained by the national lakeshore maintenance division. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. Little maintenance would be required for these lanes, other than sand and snow removal and occasional surface maintenance, all of which may be performed by the Town. An ADA-accessible picnic facility (group or individual picnic

platforms and shelters) would be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. Some short-term increased maintenance efforts would be required (if the work was done in-house), but in the long-term, impacts to park facilities and operations would be minor and beneficial. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. These additional facilities would require routine maintenance and, in addition to the parking lot attendant, would have a long-term, moderate, and adverse impact to facilities and operations.

The current annual national lakeshore maintenance labor directed to this site is 0.4 FTE, at a cost of $18,000. Labor and costs for maintenance would likely increase moderately under this alternative. No current labor or cost figures are available for other national lakeshore divisions, but they likely would increase slightly. The overall impact to national lakeshore facilities and operations from Alternative 3 would be long-term, moderate, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations under Alternative 3.

Conclusions: Implementation of Alternative 3 would result in long-term, moderate, and adverse impacts to national lakeshore facilities and operations.

Impacts to National Lakeshore Facilities and Operations by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. Once constructed, this connection would be maintained by the national lakeshore maintenance division. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. Some short-term increased maintenance efforts would be required (if the work was done in-house), but in the long-term, impacts to park facilities and operations would be minor and beneficial. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. Alternatively, this overflow lot could be constructed along the loop connector. These additional facilities would require routine maintenance and would have a long-term, moderate, and adverse impact to facilities and operations.

The current annual national lakeshore maintenance labor directed to this site is 0.4 FTE, at a cost of $18,000. Labor and costs for maintenance would likely increase moderately under this alternative. No current labor or cost figures are available for other national lakeshore divisions, but they likely would increase slightly. The overall impact to national lakeshore facilities and operations from Alternative 4 would be long-term, moderate, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations under Alternative 4.

Conclusions: Implementation of Alternative 4 would result in long-term, moderate, and adverse impacts to national lakeshore facilities and operations.

Impacts to National Lakeshore Facilities and Operations by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. The existing north lot would be open only during summer months to visitors with valid handicapped placards. In the off-season, the new south parking lot would be closed, and all visitors would use the north parking lot. Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic facilities to the beach. These additional facilities would require routine maintenance, and the new larger parking lot would require NPS attendants. This would mean a long-term, moderate, and adverse impact to facilities and operations.

The current annual national lakeshore maintenance labor directed to this site is 0.4 FTE, at a cost of $18,000. Labor and costs for maintenance would likely increase moderately under this alternative. No current labor or cost figures are available for other national lakeshore divisions, but they likely would increase slightly. The overall impact to national lakeshore facilities and operations from Alternative 5 would be long-term, moderate, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations under Alternative 5.

Conclusions: Implementation of Alternative 5 would result in long-term, moderate, and adverse impacts to national lakeshore facilities and operations.

Impacts to National Lakeshore Facilities and Operations by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Options for developing an advanced traffic warning sign system would be evaluated. Dune restoration activities, wayside exhibits (planning, construction, and maintenance), and law enforcement activities associated with traffic control and any new advance warning system would increase labor and costs for national lakeshore divisions. As a result of these increased efforts, impacts to national lakeshore facilities and operations activities would be long-term, minor, and adverse.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to national lakeshore facilities and operations.

Conclusions: Implementation of actions common to all action alternatives would result in long-term, minor, and adverse impacts to national lakeshore facilities and operations.

4.8 ADJACENT LANDOWNERS

Intensity

Negligible: Adjacent landowners would not be affected, or the effect would be at or below the lower levels of detection and would not have an appreciable effect on them.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on adjacent landowners. If mitigation were needed to offset adverse effects, it would be relatively simple and would likely be successful.

Moderate: The effects would be readily apparent and would result in a substantial change in the ability of adjacent landowners to conduct normal activities. Mitigation measures would probably offset adverse effects and would likely be successful.

Major: The effects would be readily apparent, would result in a substantial change in the ability of adjacent landowners to conduct normal activities, and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be necessary and extensive, and their success could not be guaranteed.

Duration

Short-term: Effects occur only during proposed implementation activities.

Long-term: Effects persist beyond the period of implementation activities.

Impacts to Adjacent Landowners by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. Impacts to adjacent landowners would be long-term, moderate, and adverse due to continued vehicle access problems and complaints about litter, vandalism, and noise.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners under the No Action Alternative.

Conclusions: Implementation of the No Action Alternative would result in long-term, moderate, and adverse impacts to adjacent landowners.

Impacts to Adjacent Landowners by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. Implementation of Alternative 2 would result in long-term, negligible, and beneficial impacts to adjacent landowners. The south parking lot would be upgraded within the existing footprint, resulting in no impact to adjacent landowners.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in long-term, negligible, and beneficial impacts to adjacent landowners.

Impacts to Adjacent Landowners by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. The connection between the two parking lots would provide for a negligible reduction in traffic congestion, but would remove much of the pedestrian traffic from along Wabash Avenue. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. The bike lanes would eliminate most vehicle-bicycle conflicts and assist with emergency access. An ADA-accessible picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach, ensuring adequate pedestrian access for all visitors. The picnic facility and ADA-compliant paths would be available for use by adjacent landowners, as well as the general public. The south parking lot would be upgraded within the existing footprint, resulting in no impact to adjacent landowners. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, which would increase use at the site. Implementation of Alternative 3 would result in long-term, minor, and beneficial impacts to adjacent landowners.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners under Alternative 3.

Conclusions: Implementation of Alternative 3 would result in long-term, minor, and beneficial impacts to adjacent landowners.

Impacts to Adjacent Landowners by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. The looped connection between the two parking lots would provide for a moderate reduction in traffic congestion, and the raised sidewalk would remove much of the pedestrian traffic from travel lanes on Wabash Avenue. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities, ensuring adequate pedestrian access for all visitors. The picnic facilities and ADA-compliant paths would be available for use by adjacent landowners, as well as the general public. The south parking lot would be upgraded within the existing footprint, resulting in no impact to adjacent landowners. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, which would increase use at the site, including the Lake Michigan Beach. Alternatively, an option to include parking along the looped connection could be considered. Implementation of Alternative 4 would result in long-term, minor, and beneficial impacts to adjacent landowners.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners under Alternative 4.

Conclusions: Implementation of Alternative 4 would result in long-term, minor, and beneficial impacts to adjacent landowners.

Impacts to Adjacent Landowners by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. Entrance to this parking lot would be from Wabash Avenue, and vehicles would be notified that this new parking lot is the *only* general parking available. When the parking lot is full, it would be closed, and vehicles would make the short loop back to Wabash Avenue, then be required to turn left (southbound), away from the beach. Vehicles parked in this new parking lot would also be required to turn left (southbound) on Wabash Avenue when exiting. The existing north lot would be open only during summer months to visitors with valid handicapped placards. In the off-season, the new south parking lot would be closed, and all visitors would use the north parking lot. Adjacent residents and vehicles with valid Town parking permits would have access north on Wabash Avenue. Reduced traffic and idling on Wabash Avenue would reduce exhaust emissions and associated noxious odors, as well as overall traffic congestion in this vicinity.

This alternative would offer increased opportunities for visitors to use the beach. The availability of increased parking could have both beneficial and adverse effects. Since parking is the limiting factor for beach use, more available parking will result in more opportunities for visitors to use the beach. Increased use may result in crowding, associated conflicts, and additional noise.

Individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. A picnic facility (a few individual picnic platforms and shelters) would also be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facilities, and from the picnic facilities to the beach. These developments would provide a variety of picnicking and access opportunities not currently afforded at the site for general park visitors as well as adjacent landowners. Impacts to adjacent landowners would be long-term, moderate, and beneficial (due to reduced vehicle congestion and new available picnic facilities).

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners under Alternative 5.

Conclusions: Implementation of Alternative 5 would result in long-term, moderate, and beneficial impacts to adjacent landowners.

Impacts to Adjacent Landowners by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Options for developing an advanced traffic warning sign system would be evaluated. While most of these common actions would have negligible impact to adjacent landowners, the advanced warning system would help to reduce congestion along roads leading to the site, providing for better

access to and from residences west of the site. The overall impact to adjacent landowners from Alternative 4 would be long-term, minor, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to adjacent landowners.

Conclusions: Implementation of actions common to all action alternatives would result in long-term, minor, and beneficial impacts to adjacent landowners.

4.9 TRAFFIC PATTERNS AND VOLUME

Intensity

Negligible: Traffic patterns and volume would not be affected, or the effect would be at or below the lower levels of detection.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on traffic patterns and volume.

Moderate: The effects would be readily apparent and would result in a substantial change in traffic patterns and volume.

Major: The effects would be readily apparent, would result in a substantial change in traffic patterns and volume, and would be markedly different from existing conditions.

Duration

Short-term: Effects occur only during proposed implementation activities.

Long-term: Effects persist beyond the period of implementation activities.

Impacts to Traffic Patterns and Volume by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. Continued traffic problems, making residential and visitor access difficult, would result in long-term, moderate, and adverse impacts.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes under the No Action Alternative. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of the No Action Alternative would result in long-term, moderate, and adverse impacts to traffic patterns and volume.

Impacts to Traffic Patterns and Volume by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. The south

parking lot would be upgraded within the existing footprint, resulting in no impact to traffic patterns and volume, since it would be conducted during the off-season when visitation is low. Implementation of Alternative 2 would have a long-term, negligible, and beneficial impact on traffic patterns and volume.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes under Alternative 2. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of Alternative 2 would have a long-term, negligible, and beneficial impact on traffic patterns and volume.

Impacts to Traffic Patterns and Volume by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. The direct connection between the two parking lots would provide for a negligible reduction in traffic congestion, but would remove much of the pedestrian traffic from along Wabash Avenue. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. The bike lanes would eliminate most vehicle-bicycle conflicts and assist with emergency access. The south parking lot would be upgraded within the existing footprint, resulting in no impact to traffic patterns and volume, since it would be conducted during the off-season when visitation is low. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, which would increase use at the site, including the Lake Michigan Beach. Implementation of Alternative 3 would result in long-term, minor, and beneficial impacts to traffic patterns and volume.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes under Alternative 3. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of Alternative 3 would result in long-term, minor, and beneficial impacts to traffic patterns and volume.

Impacts to Traffic Patterns and Volume by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. The looped connection between the two parking lots would provide for a moderate reduction in traffic congestion, and the raised sidewalk would remove much of the pedestrian traffic from travel lanes on Wabash Avenue. The south parking lot would be upgraded within the existing footprint, resulting in no impact to traffic patterns and volume, since it would be conducted during the off-season when visitation is low. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends, which would increase use at the site. Implementation of Alternative 4 would result in long-term, minor, and beneficial impacts to traffic patterns and volume.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes under Alternative 4. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of Alternative 4 would result in long-term, minor, and beneficial impacts to traffic patterns and volume.

Impacts to Traffic Patterns and Volume by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. Entrance to this parking lot would be from Wabash Avenue, and vehicles would be notified that this new parking lot is the *only* general parking available. When the parking lot is full, it would be closed, and vehicles would take the short loop back to Wabash Avenue, then be required to turn left (southbound), away from the beach. Vehicles parked in this new parking lot would also be required to turn left (southbound) on Wabash Avenue when exiting. The existing north lot would be open only during summer months to visitors with valid handicapped placards. In the off-season, the new south parking lot would be closed, and all visitors would use the north parking lot. Adjacent residents and vehicles with valid Town parking permits would have access north on Wabash Avenue. Traffic volumes and idling on Wabash Avenue, as well as overall traffic congestion in this vicinity, would be reduced under this alternative. ADA-compliant paths would provide pedestrians with safe, off-street access to the beach. Impacts to traffic patterns and volume would be long-term, moderate, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes under Alternative 5. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of Alternative 5 would result in long-term, moderate, and beneficial impacts to traffic patterns and volume.

Impacts to Traffic Patterns and Volume by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Any such system, if successful, would help to reduce congestion along roads leading to the project site. The overall impact would be long-term, minor, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to traffic patterns and volumes. The majority of the state park users park at one of three parking lots in the state park, with access via another road system.

Conclusions: Implementation of actions common to all action alternatives would result in long-term, minor, and beneficial impacts to traffic patterns and volume, due to the advanced traffic warning sign system.

4.10 AIR QUALITY

Intensity

Negligible: Air quality would not be affected, or the effect would be at or below the lower levels of detection.

Minor: The effect would be detectable, but would be of a magnitude that would not have an appreciable effect on air quality.

Moderate: The effects would be readily apparent and would result in a substantial change in air quality.

Major: The effects would be readily apparent, would result in a substantial change in air quality, and would be markedly different from existing conditions.

Duration

Short-term: Effects occur only during proposed implementation activities.

Long-term: Effects persist beyond the period of implementation activities.

Impacts to Air Quality by Alternative 1 (No Action)

Under Alternative 1, no major developments on the site would occur. The national lakeshore staff would continue to manage the site as at present, ensuring that visitors and resources are protected. Air quality impacts would continue to be long-term, negligible, and adverse due to exhaust emissions from idling motor vehicles.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality under the No Action Alternative.

Conclusions: Implementation of the No Action Alternative would result in long-term, negligible, and adverse impacts to air quality.

Impacts to Air Quality by Alternative 2

Alternative 2 would provide minor improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed, in a previously disturbed area, to provide for greater pedestrian safety. Methods to improve access to the beach would continue to be explored and implemented. The south parking lot would be upgraded within the existing footprint. Implementation of Alternative 2 would result in short-term, negligible, and adverse impacts to air quality from fugitive dust, due to the minor sidewalk construction at the site and south parking lot upgrades.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality under Alternative 2.

Conclusions: Implementation of Alternative 2 would result in short-term, negligible, and adverse impacts to air quality.

Impacts to Air Quality by Alternative 3

Alternative 3 would provide greater improvements to the site. A direct vehicle and pedestrian connection between the north and south parking lots would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. Five-foot-wide bike lanes would be constructed along Wabash Avenue, if approved by the Town, to encourage bicycle access to the site and to provide temporary vehicle parking for emergency vehicle access. An ADA-accessible picnic facility (group or individual picnic platforms and shelters) would be developed between the Town parking lot and the beach. ADA-compliant paths would be constructed from the parking areas to the beach, from the parking areas to the picnic facility, and from the picnic facility to the beach, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. Constructing the parking lot connection, bike lanes, picnic facility, paths, south parking lot upgrades, and overflow parking would result in short-term, negligible, and adverse impacts to air quality from fugitive dust in the immediate project area. The connection between the two parking lots would provide for a negligible reduction in traffic congestion, resulting in reduced vehicle emissions from idling and long-term, negligible, and beneficial impacts to air quality.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality under Alternative 3.

Conclusions: Implementation of Alternative 3 would result in short-term, negligible, and adverse as well as long-term, negligible, and beneficial impacts to air quality.

Impacts to Air Quality by Alternative 4

Alternative 4 would provide a variety of improvements to the site. The sidewalk along Wabash Avenue would be raised, widened, and curbed to provide for greater pedestrian safety. A looped vehicle connection between the north and south parking lots, using the existing Duneland Drive as part of its route, would be developed to reduce traffic and backups on Wabash Avenue, between Duneland Drive and Johnson Beach Road. The individual picnic platforms and shelters would be constructed east of and adjacent to the two NPS parking lots. ADA-compliant paths would be constructed from the parking areas to the beach and from the parking areas to the picnic facilities, ensuring adequate pedestrian access for all visitors. The south parking lot would be upgraded within the existing footprint. An overflow parking lot would be constructed on previously disturbed land for use on busy summer weekends. Construction activities would result in short-term, negligible, and adverse impacts to air quality from fugitive dust in the immediate project area. The looped connection between the two parking lots would provide for a minor reduction in traffic congestion, resulting in reduced vehicle emissions from idling, and long-term, minor, and beneficial impacts to air quality.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality under Alternative 4.

Conclusions: Implementation of Alternative 4 would result in short-term, negligible, and adverse as well as long-term, minor, and beneficial impacts to air quality.

Impacts to Air Quality by Alternative 5 (The Preferred Alternative)

Alternative 5, the Preferred Alternative, would provide a variety of improvements to the site. A larger parking lot (with an approximate 100 vehicle capacity) would be constructed on the existing south parking lot and extend east of it to Dabbert Drive. Since most Wabash Avenue traffic will use this

parking lot or be required to turn south on Wabash Avenue and exit the site, traffic volumes and idling on Wabash Avenue should be greatly reduced, resulting in long-term, minor, beneficial impacts to air quality. Some short-term, negligible, adverse impacts to air quality from fugitive dust will occur due to construction activities associated with parking lot development, ADA-compliant paths, and picnic facilities.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality under Alternative 5.

Conclusions: Implementation of Alternative 5 would result in short-term, negligible, and adverse as well as long-term, minor, and beneficial impacts to air quality.

Impacts to Air Quality by Actions Common to All Action Alternatives

Activities and developments described in section 2.6, "Actions Common to All Action Alternatives," would be implemented, including correcting the erosion problems associated with the foot-wash station, dune restoration, interpretive wayside development, and options for developing an advanced warning system. Any such system, if successful, would help to reduce congestion along roads leading to the project site. The overall impact would be long-term, minor, and beneficial.

Cumulative Impacts: Increased use of the site from visitors parking on non-NPS lands and from the adjacent state park would have a negligible increase in impacts to air quality.

Conclusions: Implementation of actions common to all action alternatives would result in long-term, minor, and beneficial impacts to air quality.

CHAPTER 5. CONSULTATION AND COORDINATION

5.1 EARLY COORDINATION

Scoping is the effort to involve agencies and the public in determining the issues to be addressed in the environmental assessment (EA). Among other tasks, the scoping process determines important issues and eliminates issues that are ultimately irrelevant to the project; allocates assignments among the interdisciplinary team members and other participating agencies; identifies related projects and associated documents; identifies permits, surveys, or consultations required by other agencies; and creates a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made.

> The problems and needs at the site have been recognized for years, and the National Park Service (NPS) has attempted to address them. About 10 years ago a modern restroom facility was constructed to replace the portable toilets. The parking areas were improved, and native plant beds were planted between the parking areas and Wabash Avenue. Accessible walkways were installed between Wabash Avenue and the beach. Indiana Dunes National Lakeshore (national lakeshore) submitted formal funding requests and has secured some donated funds for this project. As recently as 2011, the national lakeshore was working closely with the Town Council on plans for the site. National lakeshore staff made some presentations that provided conceptual drawings for some facilities (e.g., a picnic pavilion and viewing platform). In the fall of 2011, the national lakeshore decided to take a "fresh look" at problems and opportunities at the site. The national lakeshore decided that the EA process would be the appropriate action to take to identify possible alternatives and the impacts of those alternatives, and to encourage public participation in the process. Funds were secured for development of the EA, and the project began early in 2012.

Internal (agency) and external (public) scoping occurred prior to preparation of this EA. Internal scoping involved an interdisciplinary process to identify issues, develop a public involvement plan, identify data needs, and develop a planning process schedule. An internal scoping meeting was held on February 2, 2012, which was attended by members of the project planning team. Based on this meeting, a public involvement plan was developed that identified two stages in the process in which public comment would be solicited and considered: the public scoping stage and the public review of environmental assessment stage.

A public scoping open house was held at the Indiana Dunes National Lakeshore Visitor Center, from 6:00 p.m.-8:00 p.m. on June 28, 2012, attended by 48 individuals. Four comment cards were received at the open house, and comments were also written on available flipcharts. During the public comment period, June 28-August 1, 2012, eight public comments were received through the NPS Planning, Environment, and Public Comment (PEPC) website and one direct email. A meeting with some members of the Town Council was held on June 29, 2012 in order to better identify concerns and opportunities. A national lakeshore employee and two contractors participated.

Based on public scoping, the following general issues were identified:

- Adequate pedestrian access
- No more parking lots
- Split beach traffic and resident traffic
- Keep the site natural, restore the dunes
- Limited choices for traffic congestion due to only one road
- Picnicking not appropriate, results in longer visitor stays

- Consider developing other beach areas
- Emergency vehicle access problems
- Impacts on residents—access, litter, vandalism
- Encourage bicycle access
- Consider a shuttle service
- Lack of ADA-accessible facilities
- Strain on Town resources—police and search and rescue
- Runoff issues
- Beach overcrowding

An alternatives development workshop was held at the national lakeshore on August 13, 2012, with national lakeshore staff and contractors in attendance. The purpose of this workshop was to review and discuss the public comments received during public scoping, discuss issues and opportunities, identify draft alternatives, and identify the impacts of these alternatives on national lakeshore resources, adjacent landowners, and visitors.

5.2 PUBLIC PARTICIPATION

This environmental assessment (document) will be distributed to key agencies, groups, and individuals. The document will be available on the NPS PEPC website (parkplanning.nps.gov) and the national lakeshore's website (nps.gov/indu). The document will be available for review for a minimum of 30 days. Once the review period is over, public comments will be reviewed and considered before taking any action.

5.3 LIST OF PREPARERS

The following persons assisted with the preparation of this document:

Name	Title	Office	Role on Project
Contributors			
Constantine Dillon	Superintendent	Indiana Dunes NL	Planning and Review
Garry Traynham	Assistant Superintendent	Indiana Dunes NL	Planning and Review
Eric Ehn	Management Assistant	Indiana Dunes NL	Park Point of Contact/ Planning and Review
Bob Daum	Chief, Resource Management	Indiana Dunes NL	Planning and Review
Mike Bremer	Chief Ranger	Indiana Dunes NL	Planning and Review
Ken Ginger	Chief of Maintenance	Indiana Dunes NL	Planning and Review
Sue Bennett	Chief of Interpretation	Indiana Dunes NL	Planning and Review
Gia Wagner	Biologist	Indiana Dunes NL	Planning and Review
Preparers			
Michael Duwe	Environmental Planner	Duwe Environmental LLC	Author
Rob Kravitz	Project Manager	PRIZIM Inc.	Project Manager/Review
Scott Knebel	Traffic Engineer	LJB, Inc.	Transportation Planning
Heather Lacey	Environmental Specialist	LJB, Inc.	Transportation Planning
Scott Namestnik	Botanist	Cardno JFNew	Biological Inventory

CHAPTER 6. REFERENCES

Brock, Kenneth

1997 *Birds of the Indiana Dunes*

Council on Environmental Quality (CEQ)

1978 "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." *Code of Federal Regulations* Title 40, Parts 1500-1508. Washington, D.C.

National Park Service

1997a *East Unit General Management Plan Amendment*, Indiana Dunes National Lakeshore

1997b Director's Order #28: *Cultural Resource Management Guideline.* Washington, D.C.

2000 Director's Order #47: *Soundscape Preservation and Noise Management.* Washington, D.C.

2001 Director's Order #12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making*. Washington, D.C.

2006 *Management Policies 2006*. Washington D.C.

2007 *Porter Lakefront Park Environmental Assessment*, Indiana Dunes National Lakeshore (by contract)

2010 *Indiana Dunes National Lakeshore Visitor Study – Summer 2009*, University of Idaho, Park Studies Unit, Visitor Services Project, Report 220

2011a *Porter Brickyard Trail Environmental Assessment*, Indiana Dunes National Lakeshore (by contract)

2011b Director's Order #77, Procedural Manual #77-1: *Wetland Protection*. Washington D.C.

2011c NPSpecies – The National Park Service Biodiversity Database

2011d Park Website, Indiana Dunes National Lakeshore

2012a *Deer Management Plan/Environmental Impact Statement*, Indiana Dunes National Lakeshore

2012b Draft *Shoreline Restoration and Management Plan/Environmental Impact Statement*, Indiana Dunes National Lakeshore

2012c Draft Great Marsh – Dunes Creek Lakeplain Prairie Restoration: Phase I – Inventory, Indiana Dunes National Lakeshore

2012d Director's Order #77, Procedural Manual #77-2: *Floodplain Management*. Washington D.C.

Porter County, Indiana

1976 Soils Survey (maps)

U.S. Fish and Wildlife Service

2012 *Federal Register / Vol. 66, No. 88 / Monday, May 7, 2001*; Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Great Lakes Breeding Population of the Piping Plover

APPENDIX A. 2012 BIOLOGICAL INVENTORY

Cardno JFNew
Shaping the Future

September 4, 2012

Cardno JFNew

708 Roosevelt Road
Walkerton, Indiana 46574
USA

Phone 574 586 3400
Fax 574 586 3446
www.cardno.com

www.cardnojfnew.com

Robert A. Kravitz
Director
Prizim, Inc
9 Crawling Stone Circle
Madison, Wisconsin 53719

Subject: Biological Assessment Survey at Porter Beach Project Site, Porter County, Indiana

Dear Mr. Kravitz:

Cardno JFNew was contracted to perform a one-day biological inventory, including a survey for endangered, threatened, and rare (ETR) plant and animal species, at the approximately 11-acre Porter Beach project site in Porter County, Indiana (Figure 1). Prior to the site investigation, a request was submitted to the Indiana Department of Natural Resources (IDNR) – Division of Nature Preserves (DNP) Natural Heritage Database to generate a list of ETR plant and animal species known to occur within the vicinity of the site. This query resulted in recent records of 28 ETR vascular plants, one ETR reptile, two ETR insects, and two high quality natural communities found within a 0.5 mile range of the project site (see attached ETR query results).

Two Senior Project Scientists and one Assistant Staff Scientist from Cardno JFNew visited the Porter Beach project site on August 6, 2012. After meeting with representatives from the National Park Service to determine the project extent, we conducted meander surveys throughout the site to map plant communities and document all vascular plants observed on the site, particularly looking for ETR species and high quality natural areas. We also recorded casual observations of birds, insects, amphibians, reptiles, and mammals, and searched for habitat for plant and animal species of conservation concern. The botanical and wildlife inventories included in this report should not be considered exhaustive due to the time of year in which they were conducted. For a complete botanical and wildlife inventory, field surveys would need to be conducted at various times throughout the year.

Land cover types present on the site include beach/foredune community, dry sand prairie community, heavily degraded/no natural community identity, and developed/structures (Figure 2). The beach/foredune and dry sand prairie communities match closely with the natural communities described by Jacquart et al.[1]

[1] Jacquart, E., M. Homoya, and L. Casebere. Natural Communities of Indiana. 7/1/02 Working Draft, unpublished.

High quality foredune and high quality dry sand prairie are present on the site (Figure 3). The high quality foredune area (denoted as area 1 on Figure 3) is dominated by marram grass (*Ammophila breviligulata*, state watch list) and sand reed (*Calamovilfa longifolia* var. *magna*); dwarf fragrant sumac (*Rhus aromatica* var. *arenaria*, state rare) and dune goldenrod (*Solidago racemosa* var. *gillmanii*, state threatened) are also present in this area. Active foot trails crisscross the area. The invasive Siberian elm (*Ulmus pumila*) was present in parts of the high quality intact foredune.

Two areas of high quality dry sand prairie are present, each with a slightly different character. The first high quality dry sand prairie (denoted as area 2 on Figure 3) is dominated by little bluestem (*Andropogon scoparius*) and sand reed, and includes multiple populations of dwarf fragrant sumac. Non-native trees such as black locust (*Robinia pseudoacacia*) and Lombardy poplar (*Populus nigra* 'Italica') are encroaching into the area. The second high quality dry sand prairie area (denoted as area 3 on Figure 3) is dominated by little bluestem, sand reed, and marram grass; dwarf fragrant sumac is also present in this area, which continues off-site to the east.

The remainder of the site consists of degraded foredune and degraded woods. The degraded foredune is dominated by Siberian elm, bouncing bet (*Saponaria officinalis*), honeysuckle (*Lonicera* sp.), blue-stemmed goldenrod (*Solidago caesia*), and Oriental bittersweet (*Celastrus orbiculatus*). Included in the degraded foredune are an old home site and a septic field. The old home site was cleared recently, and is located on the north side of Johnson Beach Road. Sea rocket (*Cakile edentula*, state watch list) is present; however, overall this area is low quality. The septic field area is located to the east of the north parking lot and is not a high quality area overall. A few plants considered to be of moderate floristic quality are present in this area, which is dominated by telegraph plant (*Heterotheca subaxillaris*), sweet clover (*Melilotus* sp.), and sand dropseed (*Sporobolus cryptandrus*). The degraded woods are dominated by garlic mustard (*Alliaria petiolata*), honeysuckle, black locust, and bouncing bet; this area is considered low quality in terms of natural areas.

No federally endangered or threatened plant species are present on the site. Three plant species on the Indiana list of ETR species are present (Figure 3). There are currently no regulations affording protection to plants on the Indiana ETR list unless they are located on state lands. Two additional species on the state watch list (marram grass and sea rocket) are also present on the site. State watch list species include those that were previously on the state ETR list but that have been removed, often because enough occurrences to surpass the state rare category exist. If a species is removed from the state ETR list, it remains on the state watch list perpetually, unless there is a reason to move it back to the state ETR list. State watch list species are not actively tracked by IDNR[2]. For this reason, state watch list species were not mapped during this survey.

One of the three ETR plant species present on the site (Jack pine, *Pinus banksiana*, state rare) is present only in planting beds around the north parking lot (Figure 3). Jack pine, as well as dwarf fragrant sumac (state rare) and dune goldenrod (state threatened; referred to by the IDNR as *Solidago simplex* var. *gillmanii*) are all present in these planting beds, either as intentional introductions for landscaping purposes or as volunteers. Regardless, the planting beds are shown in Figure 3, but these populations were not specifically surveyed.

[2] Homoya, M., pers. comm. February 2008.

Fifteen (15) populations of dwarf fragrant sumac ranging from a single plant to populations approximately 100 ft^2 are present at various locations throughout the site (Figure 3). Common associated plant species documented near these populations in the high quality areas include marram grass, little bluestem, common milkweed (*Asclepias syriaca*), sand reed, honeysuckle, false boneset (*Kuhnia eupatorioides* var. *corymbulosa*), Oriental bittersweet, Canada blue grass (*Poa compressa*), black locust, bouncing bet, and Siberian elm. In the degraded areas, common associated plant species near fragrant sumac include box elder (*Acer negundo*), tree of heaven (*Ailanthus altissima*), garlic mustard, marram grass, bouncing bet, Oriental bittersweet, late boneset (*Eupatorium serotinum*), wood avens (*Geum canadense*), black walnut (*Juglans nigra*), honeysuckle, Virginia creeper (*Parthenocissus quinquefolia*), eastern cottonwood (*Populus deltoides*), choke cherry (*Prunus virginiana*), downy wafer ash (*Ptelea trifoliata* var. *mollis*), poison ivy (*Rhus radicans*), black locust, bristly cat brier (*Smilax tamnoides* var. *hispida*), blue-stemmed goldenrod, Siberian elm, and riverbank grape (*Vitis riparia*). GPS coordinates and information on each population of dwarf fragrant sumac are attached.

Three populations of dune goldenrod, ranging in size from four to approximately 75 plants, are present at the north end of the site. Common associated plant species documented near these populations include tree of heaven, marram grass, common milkweed, Oriental bittersweet, Canada wild rye (*Elymus canadensis*), white mulberry (*Morus alba*), evening primrose (*Oenothera biennis*), eastern cottonwood, downy wafer ash, black locust, lilac (*Syringa vulgaris*), Siberian elm, and riverbank grape. GPS coordinates and information on each population of dune goldenrod are attached.

A non-flowering blazing star (*Liatris* sp.) is present in the high-quality dry sand prairie area denoted as area 2 on Figure 3. Because characters necessary for identification to the species level were not present on the day of the site inspection, a definite identification could not be made. However, we believe that the plant observed is either cylindrical blazing star (*L. cylindracea*, no status), prairie blazing star (*L. pycnostachya*, state threatened), or marsh blazing star (*L. spicata*, no status). The plant location was not surveyed.

Although not necessarily tracked by IDNR-DNP, several plants with high coefficient of conservatism values (C-values) are present on the site. Swink and Wilhelm[3] assigned each native plant in the Chicago region a C-value from 0 to 10, which is a measure of the fidelity of that species to a pre-settlement native plant community, and which is also a measure of the ability of that species to withstand degradation. Plants with C values of 10 are typically the first to be lost from a site when the site begins to become degraded. Conversely, plants with C values of 0 can withstand a large amount of degradation. Plant species present on the site with C-values of 8-10 include sea rocket (C=9), downy green sedge (*Carex swanii*, C=8), hairy bedstraw (*Galium pilosum*, C=10), hairy puccoon (*Lithospermum croceum*, C=8), Jack pine (C=9), sand cherry (*Prunus pumila*, C=8), downy wafer ash (C=8), dwarf fragrant sumac (C=9), dune goldenrod (C=10), and fox grape (*Vitis labrusca*, C=9).

The mean C-value of a site is determined by averaging the C-values of all species identified on the site. The Floristic Quality Index (FQI) is a function of both the mean C-value and the number of species observed at the site. Both of these values (collectively referred to as Floristic Quality Assessment, or FQA) provide an understanding of the natural area quality of a site. Based on data collected during our site inspection, the site has a mean C-value of 2.3 and an FQI of 31.8 overall. These numbers are not indicative of a site with natural area quality. However, because these values include species observed throughout the site, plant species observed in lower quality areas bring down the FQA values from what

[3] Swink, F. and G. Wilhelm. 1994. Plants of the Chicago Region.

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they would be in the higher quality areas. Although plant inventories were not conducted separately in specific portions of the site, we believe that the FQA results in the areas documented as higher quality in this report (beach/foredune community and dry sand prairie community) would show that these parts of the site have natural area quality.

Figures, results from the IDNR-DNP ETR database query, a vascular plant species inventory (including relative abundances of each species observed on the site), documentation of each ETR plant species population, a list of wildlife species observed, and site photographs are included with this letter report.

If you have any questions, or require additional information or survey of additional areas, please feel free to contact me directly to discuss. We appreciate the opportunity to be of service.

Sincerely,

Scott Namestnik
Senior Project Scientist, Botanist
Cardno JFNew
Cell: 574 229 8747
Email: scott.namestnik@cardno.com

Enc: Figures 1-3
ETR Query Results
Vascular Plant Species Inventory
ETR Plant Population Data
Wildlife Observations
Site Photographs

cc: Mike Duwe

File: 1205077.00

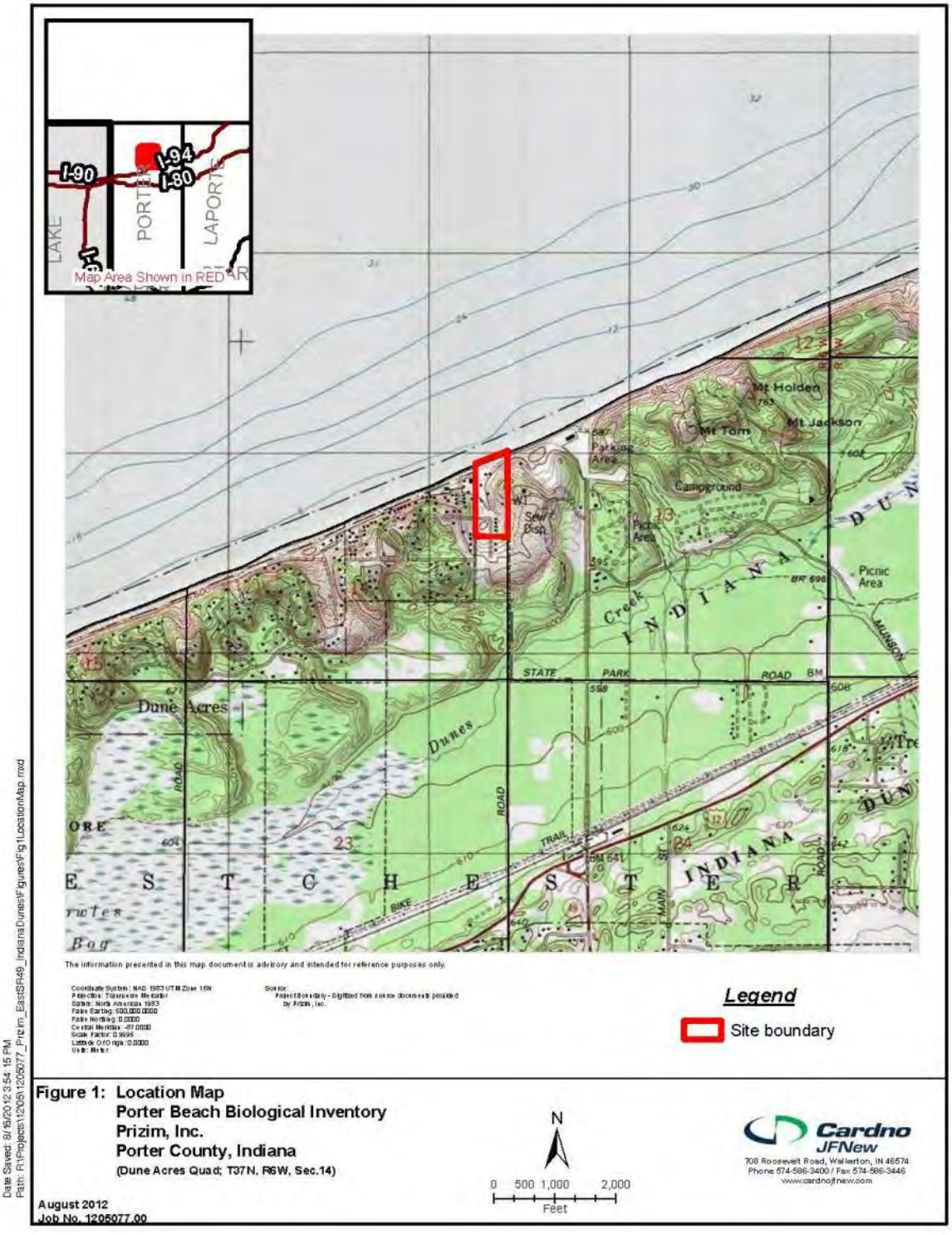

Figure 1: Location Map
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana
(Dune Acres Quad; T37N, R6W, Sec.14)

August 2012
Job No. 1205077.00

Cardno JFNew
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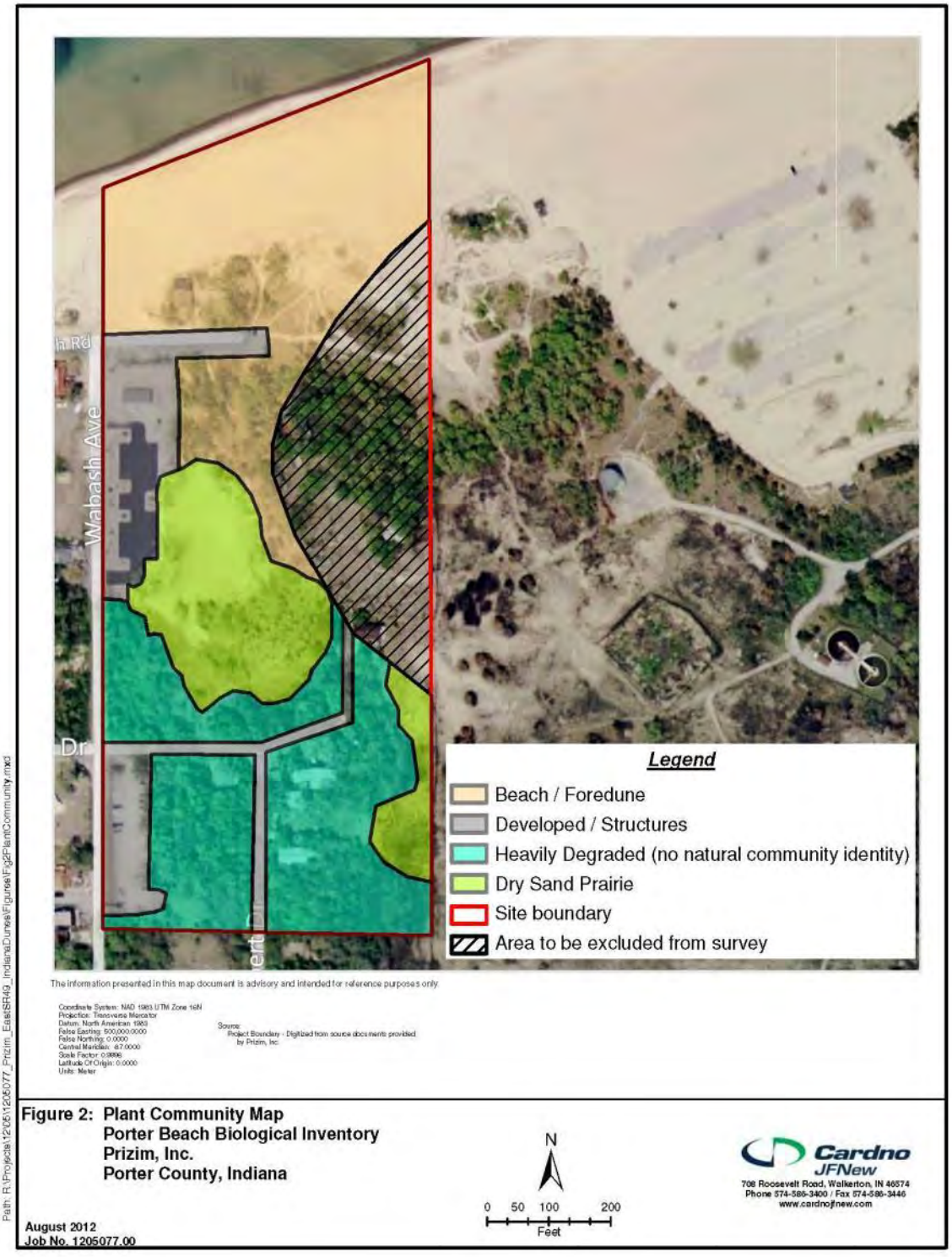
Date Saved: 8/15/2012 3:54:15 PM
Path: R:\Projects\1205\1205077_Prizim_EastSR49_IndianaDunes\Figures\Fig1LocationMap.mxd


Wabash Ave
Legend
Beach / Foredune
Developed / Structures
Heavily Degraded (no natural community identity)
Dry Sand Prairie
Site boundary
Area to be excluded from survey
The information presented in this map document is advisory and intended for reference purposes only.
Coordinate System: NAD 1983 UTM Zone 16N
Projection: Transverse Mercator
Datum: North American 1983
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -87.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter
Source:
Project Boundary - Digitized from source documents provided by Prizim, Inc.
Figure 2: Plant Community Map
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana
August 2012
Job No. 1205077.00
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Feet
Cardno JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.cardnojfnew.com
Date Saved: 8/31/2012 9:55:47 AM
Path: R:\Projects\120612\26077_Prizim_EastSR49_IndianaDunes\Figures\Fig2PlantCommunity.mxd

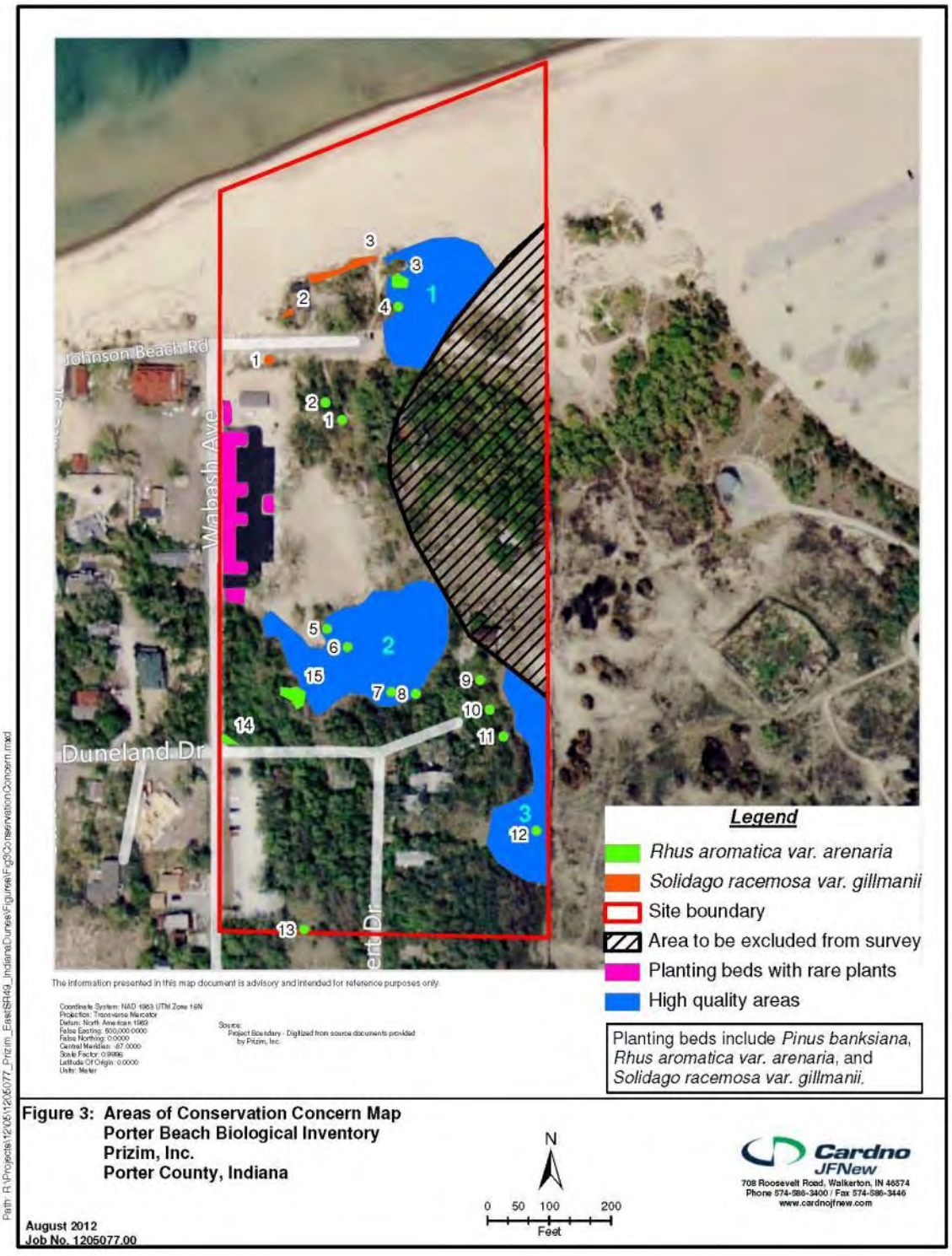

Figure 3: Areas of Conservation Concern Map
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

August 2012
Job No. 1205077.00

DNR
Indiana Department of Natural Resources

Mitchell E. Daniels, Jr., Governor
Robert E. Carter, Jr., Director

Division of Nature Preserves
402 W. Washington St., Rm W267
Indianapolis, IN 46204-2739

August 1, 2012

Scott Namestnik
Cardno JFNew
708 Roosevelt Road
Walkerton, IN 46574

Dear Scott Namestnik:

I am responding to your request for information on the endangered, threatened, or rare (ETR) species, high quality natural communities, and natural areas documented from the Porter Beach project site, Project No 1205077.00, Porter County, Indiana. The Indiana Natural Heritage Data Center has been checked and following you will find information on the ETR species documented within 0.5 mile of the project area.

For more information on the animal species mentioned, please contact Christie Stanifer, Environmental Coordinator, Division of Fish and Wildlife, 402 W. Washington Room W273, Indianapolis, Indiana 46204, (317)232-8163.

The information I am providing does not preclude the requirement for further consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act of 1973. If you have concerns about potential Endangered Species Act issues you should contact the Service at their Bloomington, Indiana office.

U.S. Fish and Wildlife Service
620 South Walker St.
Bloomington, Indiana 47403-2121
812-334-4261

At some point, you may need to contact the Department of Natural Resources' Environmental Review Coordinator so that other divisions within the department have the opportunity to review your proposal.

For more information, please contact:

Department of Natural Resources
attn: Christie Stanifer
Environmental Coordinator
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, IN 46204
(317)232-8163

Please note that the Indiana Natural Heritage Data Center relies on the observations of many individuals for our data. In most cases, the information is not the result of comprehensive field surveys conducted at particular sites. Therefore, our statement that there are no documented significant natural features at a site should not be interpreted to mean that the site does not support special plants or animals.

Due to the dynamic nature and sensitivity of the data, this information should not be used for any project other than that for which it was originally intended. It may be necessary for you to request updated material from us in order to base your planning decisions on the most current information.

Thank you for contacting the Indiana Natural Heritage Data Center. You may reach me at (317)232-8059 if you have any questions or need additional information.

Sincerely,

Ronald P. Hellmich

Ronald P. Hellmich
Indiana Natural Heritage Data Center

Enclosure: invoice
Data sheet

August 1, 2012

Endangered, Threatened and Rare Species and Significant Natural Areas Documented Within 0.5 Mile of the Porter Beach Project 1205077.00 Site, Porter County, Indiana

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Pinus banksiana	Jack Pine		SR	037N006W 14 NEQ SEQ SWQ	1992-07-16	
Vascular Plant	Rhus aromatica var. arenaria	Beach Sumac		SR	037N006W 14 SEQ NEQ SWQ	1992-07-16	
IDNL - DUNE ACRES UNIT							
High Quality Natural Community	Prairie - sand dry-mesic	Dry-mesic Sand Prairie		SG	037N006W 14 S HALF SEQ	1979-09	
High Quality Natural Community	Savanna - sand dry-mesic	Dry-mesic Sand Savanna		SG	037N006W 14 S HALF SEQ	1979-09	
Reptile	Ophisaurus attenuatus attenuatus	Western Slender Glass Lizard			037N006W 14 SH SEQ	1987-09-14	
Vascular Plant	Carex seorsa	Weak Stellate Sedge		SR	037N006W 14 SEQ SEQ	1982-05-07	
Vascular Plant	Drosera intermedia	Spoon-leaved Sundew		SR	037N006W 14 SEQ	1987-08-01	
Vascular Plant	Fimbristylis puberula	Carolina Fimbry		SE	037N006W 14 SEQ	1979-07	
Vascular Plant	Geranium bicknellii	Bicknell Northern Crane's-bill		SE	037N006W 14 SEQ SEQ	1987-07-30	
Vascular Plant	Hudsonia tomentosa	Sand-heather		ST	037N006W 14	1979-07	
Vascular Plant	Myosotis laxa	Smaller Forget-me-not		ST	037N006W 14 SEQ SEQ SEQ	1992-07-22	

Fed: LE = listed federal endangered; LT = listed federal threatened; C = federal candidate species

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank = unlisted species but tracked due to rarity concerns.

Page 1 of 4

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Pinus banksiana	Jack Pine		SR	037N006W 14 SEQ SEQ	1976-10-09	
Vascular Plant	Polygonella articulata	Eastern Jointweed		SR	037N006W 14	1933-09-13	
Vascular Plant	Polygonum hydropiperoides var. opelousanum	Northeastern Smartweed		ST	037N006W 14 SEQ	1987-07-22	
Vascular Plant	Rhynchospora recognita	Globe Beaked-rush		SE	037N006W 14 SEQ	1987-07-21	
Vascular Plant	Buchnera americana	Bluehearts		SE	037N006W 14 NEQ SWQ SEQ	1987-07-30	
Vascular Plant	Cirsium pitcheri	Dune Thistle	LT	ST	037N006W 14 NWQ SWQ SEQ & SEQ NEQ SWQ	1991	
Insect Lepidoptera	Lycaeides melissa samuelis	Karner Blue	LE	SE	037N006W 14 SH SH SEQ	1995	
Insect Lepidoptera	Problema byssus	Bunchgrass Skipper		ST	037N006W 14 SH SH SEQ	1995	
Vascular Plant	Eleocharis melanocarpa	Black-fruited Spike-rush		ST	037N006W 14 SEQ	1979-06	
Vascular Plant	Gentiana alba	Yellow Gentian		SR	037N006W 14 SEQ	1980-08	
INDIANA DUNES STATE PARK							
Reptile	Ophisaurus attenuatus attenuatus	Western Slender Glass Lizard			037N005W 18	1933	
Vascular Plant	Arctostaphylos uva-ursi	Bearberry		SR	037N006W 13 NWQ SWQ	1987-10-09	
Vascular Plant	Arenaria stricta	Michaux's Stitchwort		SR	037N006W 13	1916-06-03	

Fed: LE = listed federal endangered; LT = listed federal threatened; C = federal candidate species

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank = unlisted species but tracked due to rarity concerns.

Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Aristida tuberculosa	Seabeach Needlegrass		SR	037N006W 13 NWQ SWQ	1987-10-09	
Vascular Plant	Diervilla lonicera	Northern Bush-honeysuckle		SR	037N006W ALONG LAKE N OF CHESTERTON	1918-09-14	
Vascular Plant	Diervilla lonicera	Northern Bush-honeysuckle		SR	037N006W ALONG LAKE N OF CHESTERTON	1918-09-14	
Vascular Plant	Epigaea repens	Trailing Arbutus		WL	037N006W 13 SEQ NWQ	1990	
Vascular Plant	Juniperus communis	Ground Juniper		SR	037N006W 13	1916-06-03	
Vascular Plant	Melampyrum lineare	American Cow-wheat		SR	037N006W 13 NEQ SEQ NWQ	1990	
Vascular Plant	Myosotis laxa	Smaller Forget-me-not		ST	037N006W 13 SEQ SEQ NWQ	1986-08-27	
Vascular Plant	Oryzopsis pungens	Slender Mountain-ricegrass		SX	037N006W 13	1929-05-29	
Vascular Plant	Panax trifolius	Dwarf Ginseng		WL	037N006W 13 SWQ SEQ SWQ	1994-04-26	
Vascular Plant	Platanthera psycodes	Small Purple-fringe Orchis		SR	037N006W 13 NWQ SEQ SWQ	1994-07-21	
Vascular Plant	Platanthera psycodes	Small Purple-fringe Orchis		SR	037N006W 13 NEQ NEQ SWQ & SEQ NWQ	1990	
Vascular Plant	Polygonella articulata	Eastern Jointweed		SR	037N006W 13 NWQ SWQ	1987-10-09	
Vascular Plant	Salix cordata	Heartleaf Willow		ST	037N006W 13	1929-07	

Fed: LE = listed federal endangered; LT = listed federal threatened; C = federal candidate species

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank = unlisted species but tracked due to rarity concerns.

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Type	Species Name	Common Name	Fed	State	Town Range	Date	Comments
Vascular Plant	Selaginella rupestris	Ledge Spike-moss		ST	037N006W 13 SH NWQ SWQ	1988-07-01	
Vascular Plant	Lycopodium lucidulum	Shining Clubmoss		WL	037N006W 13	2007-11-15	

Fed: LE = listed federal endangered; LT = listed federal threatened; C = federal candidate species

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SG = state significant; WL = Watch List; no rank = unlisted species but tracked due to rarity concerns.

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Prizim, Inc. - Porter Beach September 4, 2012

VASCULAR PLANT SPECIES INVENTORY

Site: Porter Beach
Locale: Porter County, Indiana
Date: 8/6/2012 6.3 hours
By: A. Lima, S. Namestnik, T. Troche
File: r:\Projects\12\05\1205077_Prizim_EastSR49_IndianaDunes\Data\20120813_ETR survey inventory.tra

C	NUMBER		111	NATIVE SPECIES
0	19		185	TOTAL SPECIES
1	9		3.9	NATIVE MEAN C
2	9	0 to 3	2.3	W/Adventives
3	11	43.20%	41.1	NATIVE FQI
4	10		31.8	W/Adventives
5	25		2.4	NATIVE MEAN W
6	6	4 to 7	2.8	W/Adventives
7	12	47.70%		
8	4			
9	4	8 to 10		
10	2	9.00%		

Native	111	60.00%	Adventive	74	40.00%
Tree	12	6.50%	Tree	8	4.30%
Shrub	8	4.30%	Shrub	7	3.80%
W-Vine	5	2.70%	W-Vine	2	1.10%
H-Vine	1	0.50%	H-Vine	0	0.00%
P-Forb	37	20.00%	P-Forb	21	11.40%
B-Forb	9	4.90%	B-Forb	10	5.40%
A-Forb	10	5.40%	A-Forb	11	5.90%
P-Grass	17	9.20%	P-Grass	8	4.30%
A-Grass	2	1.10%	A-Grass	7	3.80%
P-Sedge	8	4.30%	P-Sedge	0	0.00%
A-Sedge	0	0.00%	A-Sedge	0	0.00%
Cryptogam	2	1.10%			

Note: only plants identified to at least the species level included in summaries above.

C	SCIENTIFIC NAME	W	WETNESS	PHYSIOGNOMY	COMMON NAME
0	Acer negundo	-2	FACW-	Nt Tree	BOX ELDER
0	Acer saccharinum	-3	FACW	Nt Tree	SILVER MAPLE
3	Acer saccharum	3	FACU	Nt Tree	SUGAR MAPLE
0	ACHILLEA MILLEFOLIUM	3	FACU	Ad P-Forb	YARROW
0	AGROPYRON REPENS	3	FACU	Ad P-Grass	QUACK GRASS
0	AILANTHUS ALTISSIMA	5	UPL	Ad Tree	TREE OF HEAVEN
0	AJUGA REPTANS	5	UPL	Ad P-Forb	CARPET BUGLE
0	ALLIARIA PETIOLATA	0	FAC	Ad B-Forb	GARLIC MUSTARD
0	Ambrosia artemisiifolia elatior	3	FACU	Nt A-Forb	COMMON RAGWEED
	Amelanchier sp.		FACU-UPL	Nt Shrub	SHADBLOW
7	Ammophila breviligulata	5	UPL	Nt P-Grass	MARRAM GRASS
5	Andropogon gerardii	1	FAC-	Nt P-Grass	BIG BLUESTEM GRASS
5	Andropogon scoparius	4	FACU-	Nt P-Grass	LITTLE BLUESTEM GRASS
6	Anemone cylindrica	5	UPL	Nt P-Forb	THIMBLEWEED
6	Aquilegia canadensis	1	FAC-	Nt P-Forb	WILD COLUMBINE
5	Arabis lyrata	4	FACU-	Nt B-Forb	SAND CRESS
0	ARCTIUM MINUS	5	UPL	Ad B-Forb	COMMON BURDOCK
0	ARENARIA SERPYLLIFOLIA	0	FAC	Ad A-Forb	THYME-LEAVED SANDWORT
5	Artemisia caudata	5	UPL	Nt B-Forb	BEACH WORMWOOD
0	ARTEMISIA VULGARIS	5	UPL	Ad P-Forb	MUGWORT
0	Asclepias syriaca	5	UPL	Nt P-Forb	COMMON MILKWEED
7	Asclepias tuberosa	5	UPL	Nt P-Forb	BUTTERFLY WEED
0	ASPARAGUS OFFICINALIS	3	FACU	Ad P-Forb	ASPARAGUS
5	Aster ericoides	4	FACU-	Nt P-Forb	HEATH ASTER
4	Aster lateriflorus	-2	FACW-	Nt P-Forb	SIDE-FLOWERING ASTER
0	Aster pilosus	2	FACU+	Nt P-Forb	HAIRY ASTER
0	BERTEROA INCANA	5	UPL	Ad A-Forb	HOARY ALYSSUM

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Prizim, Inc. - Porter Beach

September 4, 2012

0	BIDENS BIPINNATA	5	UPL	Ad A-Forb	SPANISH NEEDLES
0	BROMUS INERMIS	5	UPL	Ad P-Grass	HUNGARIAN BROME
0	BROMUS JAPONICUS	3	FACU	Ad A-Grass	JAPANESE CHESS
0	BROMUS STERILIS	5	UPL	Ad A-Grass	POVERTY BROME
0	BROMUS TECTORUM	5	UPL	Ad A-Grass	DOWNY BROME
9	Cakile edentula	3	FACU	Nt A-Forb	SEA ROCKET
5	Calamovilfa longifolia magna	5	UPL	Nt P-Grass	SAND REED
1	Carex blanda	0	FAC	Nt P-Sedge	COMMON WOOD SEDGE
4	Carex granularis	-4	FACW+	Nt P-Sedge	PALE SEDGE
5	Carex pensylvanica	5	UPL	Nt P-Sedge	COMMON OAK SEDGE
8	Carex swanii	3	FACU	Nt P-Sedge	DOWNY GREEN SEDGE
2	Carex vulpinoidea	-5	OBL	Nt P-Sedge	BROWN FOX SEDGE
0	CATALPA BIGNONIOIDES	3	FACU	Ad Tree	SOUTHERN CATALPA
0	CELASTRUS ORBICULATUS	5	UPL	Ad W-Vine	ORIENTAL BITTERSWEET
3	Celtis occidentalis	1	FAC-	Nt Tree	HACKBERRY
0	Cenchrus longispinus	5	UPL	Nt A-Grass	SANDBUR
0	CHELIDONIUM MAJUS	5	UPL	Ad B-Forb	CELANDINE
0	CHENOPODIUM ALBUM	1	FAC-	Ad A-Forb	LAMB'S QUARTERS
5	Chenopodium leptophyllum	5	[UPL]	Nt A-Forb	NARROW-LEAVED GOOSEFOOT
0	COMMELINA COMMUNIS	0	FAC	Ad A-Forb	COMMON DAY FLOWER
0	CONVALLARIA MAJALIS	5	UPL	Ad P-Forb	LILY-OF-THE-VALLEY
5	Coreopsis tripteris	0	FAC	Nt P-Forb	TALL COREOPSIS
5	Corispermum hyssopifolium	3	FACU	Nt A-Forb	BUGSEED
6	Cornus stolonifera	-3	FACW	Nt Shrub	RED-OSIER DOGWOOD
0	CORONILLA VARIA	5	UPL	Ad P-Forb	CROWN VETCH
0	CROTON GLANDULOSUS SEPTENTRIONALIS	5	UPL	Ad A-Forb	SAND CROTON
7	Cycloloma atriplicifolium	3	FACU	Nt A-Forb	WINGED PIGWEED
5	Cyperus filiculmis	4	FACU-	Nt P-Sedge	SLENDER SAND SEDGE
5	Cyperus schweinitzii	5	[UPL]	Nt P-Sedge	ROUGH SAND SEDGE
5	Cyperus X mesochorus	5	UPL	Nt P-Sedge	MIDLAND SAND SEDGE
0	DACTYLIS GLOMERATA	3	FACU	Ad P-Grass	ORCHARD GRASS
0	DAUCUS CAROTA	5	UPL	Ad B-Forb	QUEEN ANNE'S LACE
0	DIGITARIA SANGUINALIS	3	FACU	Ad A-Grass	HAIRY CRAB GRASS
3	Echinacea purpurea	5	UPL	Nt P-Forb	BROAD-LEAVED PURPLE CONEFLOWER
0	ELAEAGNUS UMBELLATA	5	UPL	Ad Shrub	AUTUMN OLIVE
4	Elymus canadensis	1	FAC-	Nt P-Grass	CANADA WILD RYE
0	Equisetum arvense	0	FAC	Cryptogam	HORSETAIL
3	Equisetum hyemale	-2	FACW-	Cryptogam	TALL SCOURING RUSH
0	ERAGROSTIS POAEOIDES	5	UPL	Ad A-Grass	LOW LOVE GRASS
0	Erigeron annuus	1	FAC-	Nt B-Forb	ANNUAL FLEABANE
0	Erigeron canadensis	1	FAC-	Nt A-Forb	HORSEWEED
5	Erigeron strigosus	5	[UPL]	Nt B-Forb	DAISY FLEABANE
0	Eupatorium altissimum	3	[FACU]	Nt P-Forb	TALL BONESET
4	Eupatorium rugosum	5	UPL	Nt P-Forb	WHITE SNAKEROOT
0	Eupatorium serotinum	-1	FAC+	Nt P-Forb	LATE BONESET
2	Euphorbia corollata	5	UPL	Nt P-Forb	FLOWERING SPURGE
0	EUPHORBIA DENTATA	5	UPL	Ad A-Forb	TOOTHED SPURGE
0	FESTUCA ELATIOR	2	FACU+	Ad P-Grass	TALL FESCUE
0	FESTUCA RUBRA	1	FAC-	Ad P-Grass	RED FESCUE
1	Galium aparine	3	FACU	Nt A-Forb	ANNUAL BEDSTRAW
7	Galium circaezans hypomalacum	5	[UPL]	Nt P-Forb	HAIRY WILD LICORICE
10	Galium pilosum	5	UPL	Nt P-Forb	HAIRY BEDSTRAW
1	Geum canadense	0	FAC	Nt P-Forb	WOOD AVENS
0	GLECHOMA HEDERACEA	3	FACU	Ad P-Forb	CREEPING CHARLIE
0	Hackelia virginiana	1	FAC-	Nt B-Forb	STICKSEED
0	HELIANTHUS PETIOLARIS	5	UPL	Ad A-Forb	PETIOLED SUNFLOWER
0	HEMEROCALLIS FULVA	5	UPL	Ad P-Forb	ORANGE DAY LILY
0	HESPERIS MATRONALIS	5	UPL	Ad P-Forb	DAME'S ROCKET
0	HETEROTHECA SUBAXILLARIS	5	UPL	Ad A-Forb	TELEGRAPH PLANT
5	Hystrix patula	5	UPL	Nt P-Grass	BOTTLEBRUSH GRASS
0	IRIS SP.	5	UPL	Ad P-Forb	IRIS
5	Juglans nigra	3	FACU	Nt Tree	BLACK WALNUT
0	Juncus tenuis	2	[FACU+]	Nt P-Forb	PATH RUSH
2	Juniperus virginiana crebra	3	FACU	Nt Tree	RED CEDAR
7	Koeleria cristata	5	UPL	Nt P-Grass	JUNE GRASS

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6	Kuhnia eupatorioides corymbulosa	5	UPL	Nt	P-Forb	FALSE BONESET
4	Lactuca biennis	0	FAC	Nt	B-Forb	TALL BLUE LETTUCE
2	Lactuca canadensis	2	FACU+	Nt	B-Forb	WILD LETTUCE
0	LACTUCA SERRIOLA	0	FAC	Ad	B-Forb	PRICKLY LETTUCE
7	Leersia virginica	-3	FACW	Nt	P-Grass	WHITE GRASS
0	LEONURUS CARDIACA	5	UPL	Ad	P-Forb	MOTHERWORT
0	LEPIDIUM CAMPESTRE	5	UPL	Ad	B-Forb	FIELD CRESS
0	Lepidium virginicum	4	FACU-	Nt	A-Forb	COMMON PEPPERCRESS
	Liatris sp.		FAC--UPL	Nt	P-Forb	BLAZING STAR
0	LIGUSTRUM VULGARE	1	FAC-	Ad	Shrub	COMMON PRIVET
8	Lithospermum croceum	5	UPL	Nt	P-Forb	HAIRY PUCCOON
0	LONICERA JAPONICA	3	FACU	Ad	W-Vine	JAPANESE HONEYSUCKLE
0	LONICERA SP.		FACU-UPL	Ad	Shrub	HONEYSUCKLE
0	LYCHNIS ALBA	5	UPL	Ad	A-Forb	WHITE CAMPION
0	LYCORIS SQUAMIGERA	5	UPL	Ad	P-Forb	RESURRECTION LILY
0	MELILOTUS ALBA	3	FACU	Ad	B-Forb	WHITE SWEET CLOVER
0	MIRABILIS NYCTAGINEA	5	UPL	Ad	P-Forb	WILD FOUR O'CLOCK
4	Monarda fistulosa	3	FACU	Nt	P-Forb	WILD BERGAMOT
5	Monarda punctata	5	UPL	Nt	P-Forb	HORSE MINT
0	MORUS ALBA	0	FAC	Ad	Tree	WHITE MULBERRY
3	Muhlenbergia frondosa	-3	FACW	Nt	P-Grass	COMMON SATIN GRASS
5	Muhlenbergia mexicana	-3	FACW	Nt	P-Grass	LEAFY SATIN GRASS
0	Muhlenbergia schreberi	3	[FACU]	Nt	P-Grass	NIMBLEWILL
0	NEPETA CATARIA	1	FAC-	Ad	P-Forb	CATNIP
0	Oenothera biennis	3	FACU	Nt	B-Forb	COMMON EVENING PRIMROSE
7	Oenothera clelandii	5	[UPL]	Nt	B-Forb	SAND EVENING PRIMROSE
5	Opuntia humifusa	5	UPL	Nt	Shrub	EASTERN PRICKLY PEAR
3	Osmorhiza claytonii	4	FACU-	Nt	P-Forb	HAIRY SWEET CICELY
0	Oxalis stricta	5	UPL	Nt	P-Forb	COMMON WOOD SORREL
6	Panicum clandestinum	-3	FACW	Nt	P-Grass	DEER-TONGUE GRASS
4	Panicum oligosanthes scribnerianum	3	[FACU]	Nt	P-Grass	SCRIBNER'S PANIC GRASS
7	Panicum villosissimum pseudopubescens	5	UPL	Nt	P-Grass	FALSE WHITE-HAIRED PANIC GRASS
5	Panicum virgatum	-1	FAC+	Nt	P-Grass	SWITCH GRASS
3	Parietaria pensylvanica	3	FACU	Nt	A-Forb	PELLITORY
2	Parthenocissus quinquefolia	1	FAC-	Nt	W-Vine	VIRGINIA CREEPER
0	PHILADELPHUS SP.	5	UPL	Ad	Shrub	MOCK ORANGE
0	PHLOX PANICULATA	3	FACU	Ad	P-Forb	GARDEN PHLOX
3	Physalis heterophylla	5	UPL	Nt	P-Forb	CLAMMY GROUND CHERRY
0	Physalis subglabrata	5	UPL	Nt	P-Forb	TALL GROUND CHERRY
1	Phytolacca americana	1	FAC-	Nt	P-Forb	POKEWEED
0	PICEA PUNGENS	5	UPL	Ad	Tree	BLUE SPRUCE
9	Pinus banksiana	3	FACU	Nt	Tree	JACK PINE
0	PINUS SYLVESTRIS	5	UPL	Ad	Tree	SCOTCH PINE
0	PLANTAGO LANCEOLATA	0	FAC	Ad	P-Forb	ENGLISH PLANTAIN
0	PLANTAGO MAJOR	-1	FAC+	Ad	P-Forb	COMMON PLANTAIN
0	POA COMPRESSA	2	FACU+	Ad	P-Grass	CANADA BLUE GRASS
0	POA PRATENSIS	1	FAC-	Ad	P-Grass	KENTUCKY BLUE GRASS
1	Polygonum scandens	0	FAC	Nt	H-Vine	CLIMBING FALSE BUCKWHEAT
2	Populus deltoides	-1	FAC+	Nt	Tree	EASTERN COTTONWOOD
0	POPULUS NIGRA ITALICA	5	UPL	Ad	Tree	LOMBARDY POPLAR
8	Prunus pumila	5	UPL	Nt	Shrub	SAND CHERRY
1	Prunus serotina	3	FACU	Nt	Tree	WILD BLACK CHERRY
3	Prunus virginiana	3	[FACU]	Nt	Shrub	CHOKE CHERRY
8	Ptelea trifoliata mollis	5	[UPL]	Nt	Shrub	DOWNY WAFER ASH
7	Quercus rubra	3	FACU	Nt	Tree	RED OAK
6	Quercus velutina	5	UPL	Nt	Tree	BLACK OAK
0	RHAMNUS CATHARTICA	3	FACU	Ad	Shrub	COMMON BUCKTHORN
0	RHAMNUS FRANGULA	-1	FAC+	Ad	Shrub	GLOSSY BUCKTHORN
9	Rhus aromatica arenaria	5	UPL	Nt	Shrub	DWARF FRAGRANT SUMAC
2	Rhus radicans	-1	FAC+	Nt	W-Vine	POISON IVY
5	Ribes cynosbati	5	UPL	Nt	Shrub	PRICKLY WILD GOOSEBERRY
0	ROBINIA PSEUDOACACIA	4	FACU-	Ad	Tree	BLACK LOCUST
0	ROSA MULTIFLORA	3	FACU	Ad	Shrub	MULTIFLORA ROSE
1	Rudbeckia hirta	3	FACU	Nt	P-Forb	BLACK-EYED SUSAN
0	RUMEX ACETOSELLA	3	[FACU]	Ad	P-Forb	FIELD SORREL

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0	RUMEX CRISPUS	-1	FAC+	Ad P-Forb	CURLY DOCK
1	Salix interior	-5	OBL	Nt Shrub	SANDBAR WILLOW
0	SAPONARIA OFFICINALIS	3	FACU	Ad P-Forb	BOUNCING BET
0	SEDUM SP.	5	UPL	Ad P-Forb	SEDUM
0	SETARIA VIRIDIS	1	(FAC-)	Ad A-Grass	GREEN FOXTAIL
0	SETARIA VIRIDIS MAJOR	5	UPL	Ad A-Grass	GIANT GREEN FOXTAIL
5	Smilacina stellata	1	FAC-	Nt P-Forb	STARRY FALSE SOLOMON'S SEAL
5	Smilax tamnoides hispida	5	UPL	Nt W-Vine	BRISTLY CAT BRIER
0	Solanum americanum	4	FACU-	Nt A-Forb	BLACK NIGHTSHADE
0	SOLANUM CAROLINENSE	4	FACU-	Ad P-Forb	HORSE NETTLE
1	Solidago altissima	3	FACU	Nt P-Forb	TALL GOLDENROD
7	Solidago caesia	3	FACU	Nt P-Forb	BLUE-STEMMED GOLDENROD
4	Solidago gigantea	-3	FACW	Nt P-Forb	LATE GOLDENROD
3	Solidago graminifolia nuttallii	0	[FAC]	Nt P-Forb	HAIRY GRASS-LEAVED GOLDENROD
4	Solidago nemoralis	5	UPL	Nt P-Forb	OLD-FIELD GOLDENROD
10	Solidago racemosa gillmanii	5	UPL	Nt P-Forb	DUNE GOLDENROD
7	Solidago speciosa	5	UPL	Nt P-Forb	SHOWY GOLDENROD
5	Sorghastrum nutans	2	FACU+	Nt P-Grass	INDIAN GRASS
7	Sporobolus cryptandrus	4	FACU-	Nt P-Grass	SAND DROPSEED
0	SYRINGA VULGARIS	5	UPL	Ad Shrub	LILAC
0	TARAXACUM OFFICINALE	3	FACU	Ad P-Forb	COMMON DANDELION
5	Tilia americana	3	FACU	Nt Tree	AMERICAN LINDEN
2	Tradescantia ohiensis	2	FACU+	Nt P-Forb	COMMON SPIDERWORT
0	TRAGOPOGON DUBIUS	5	UPL	Ad B-Forb	SAND GOAT'S BEARD
0	TRIODIA FLAVA	5	UPL	Ad P-Grass	FALSE REDTOP
0	ULMUS PUMILA	5	UPL	Ad Tree	SIBERIAN ELM
0	VERBASCUM BLATTARIA	3	FACU	Ad B-Forb	MOTH MULLEIN
0	VERBASCUM THAPSUS	5	UPL	Ad B-Forb	COMMON MULLEIN
3	Viola sororia	1	FAC-	Nt P-Forb	COMMON BLUE VIOLET
9	Vitis labrusca	3	FACU	Nt W-Vine	FOX GRAPE
2	Vitis riparia	-2	FACW-	Nt W-Vine	RIVERBANK GRAPE
4	Vulpia octoflora	4	FACU-	Nt A-Grass	SIX WEEKS FESCUE
0	XANTHIUM STRUMARIUM	0	FAC	Ad A-Forb	COCKLEBUR
0	YUCCA SMALLIANA	5	UPL	Ad Shrub	ADAM'S NEEDLE
	Cyperaceae		OBL-UPL		UNIDENTIFIABLE SEDGE
	Poaceae (maybe Bouteloua curtipendula)		OBL-UPL		UNIDENTIFIABLE GRASS
	Umbellifetae		OBL-UPL		UNIDENTIFIABLE PARSLEY

SPECIES BY ABUNDANCE

ABUNDANCE RANKINGS	
1	Rare
2	Uncommon
3	Locally common
4	Common
5	Locally abundant
6	Abundant

STATUS	
ST	State Threatened
SR	State Rare
SWL	State Watch List

SCIENTIFIC NAME	C	WETNESS	STATUS	ABUNDANCE
Ammophila breviligulata	7	UPL	SWL	6
Andropogon scoparius	5	FACU-		6
Calamovilfa longifolia magna	5	UPL		6
CELASTRUS ORBICULATUS	0	UPL		6
POA COMPRESSA	0	FACU+		6
ROBINIA PSEUDOACACIA	0	FACU-		6
SAPONARIA OFFICINALIS	0	FACU		6
AGROPYRON REPENS	0	FACU		5
AILANTHUS ALTISSIMA	0	UPL		5
ARTEMISIA VULGARIS	0	UPL		5
BROMUS STERILIS	0	UPL		5
Carex pensylvanica	5	UPL		5
FESTUCA RUBRA	0	FAC-		5
POPULUS NIGRA ITALICA	0	UPL		5
Ambrosia artemisiifolia elatior	0	FACU		4

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ARENARIA SERPYLLIFOLIA	0	FAC		4
Asclepias syriaca	0	UPL		4
BROMUS TECTORUM	0	UPL		4
Erigeron canadensis	0	FAC-		4
Kuhnia eupatorioides corymbulosa	6	UPL		4
LONICERA SP.	0	FACU-UPL		4
MORUS ALBA	0	FAC		4
Opuntia humifusa	5	UPL		4
Oxalis stricta	0	UPL		4
Parthenocissus quinquefolia	2	FAC-		4
Ptelea trifoliata mollis	8	[UPL]		4
Rhus aromatica arenaria	9	UPL	SR	4
Rhus radicans	2	FAC+		4
SETARIA VIRIDIS	0	[FAC-]		4
Tradescantia ohiensis	2	FACU+		4
ULMUS PUMILA	0	UPL		4
Vitis riparia	2	FACW-		4
ALLIARIA PETIOLATA	0	FAC		3
Arabis lyrata	5	FACU-		3
Artemisia caudata	5	UPL		3
CONVALLARIA MAJALIS	0	UPL		3
DACTYLIS GLOMERATA	0	FACU		3
Euphorbia corollata	2	UPL		3
Geum canadense	1	FAC		3
GLECHOMA HEDERACEA	0	FACU		3
Hackelia virginiana	0	FAC-		3
HETEROTHECA SUBAXILLARIS	0	UPL		3
LIGUSTRUM VULGARE	0	FAC-		3
Lithospermum croceum	8	UPL		3
LONICERA JAPONICA	0	FACU		3
Monarda punctata	5	UPL		3
POA PRATENSIS	0	FAC-		3
Quercus velutina	6	UPL		3
Smilacina stellata	5	FAC-		3
Solidago caesia	7	FACU		3
Solidago nemoralis	4	UPL		3
Solidago speciosa	7	UPL		3
Poaceae (maybe Bouteloua curtipendula)		OBL-UPL		3
Acer negundo	0	FACW-		2
ACHILLEA MILLEFOLIUM	0	FACU		2
AJUGA REPTANS	0	UPL		2
Andropogon gerardii	5	FAC-		2
Aster lateriflorus	4	FACW-		2
Aster pilosus	0	FACU+		2
BIDENS BIPINNATA	0	UPL		2
BROMUS INERMIS	0	UPL		2
BROMUS JAPONICUS	0	FACU		2
Cakile edentula	9	FACU	SWL	2
Carex swanii	8	FACU		2
CATALPA BIGNONIOIDES	0	FACU		2
Celtis occidentalis	3	FAC-		2
Cenchrus longispinus	0	UPL		2
CHENOPODIUM ALBUM	0	FAC-		2
Corispermum hyssopifolium	5	FACU		2
CROTON GLANDULOSUS SEPTENTRIONALIS	0	UPL		2
Cycloloma atriplicifolium	7	FACU		2
DAUCUS CAROTA	0	UPL		2
DIGITARIA SANGUINALIS	0	FACU		2
ELAEAGNUS UMBELLATA	0	UPL		2
Elymus canadensis	4	FAC-		2
Equisetum arvense	0	FAC		2
Equisetum hyemale	3	FACW-		2
ERAGROSTIS POAEOIDES	0	UPL		2
Erigeron annuus	0	FAC-		2
Erigeron strigosus	5	[UPL]		2

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Eupatorium altissimum	0	[FACU]		2
Eupatorium rugosum	4	UPL		2
Eupatorium serotinum	0	FAC+		2
FESTUCA ELATIOR	0	FACU+		2
Galium aparine	1	FACU		2
HELIANTHUS PETIOLARIS	0	UPL		2
HESPERIS MATRONALIS	0	UPL		2
Hystrix patula	5	UPL		2
IRIS SP.	0	UPL		2
Juglans nigra	5	FACU		2
Juncus tenuis	0	[FACU+]		2
Lactuca biennis	4	FAC		2
Lactuca canadensis	2	FACU+		2
LACTUCA SERRIOLA	0	FAC		2
LEONURUS CARDIACA	0	UPL		2
LEPIDIUM CAMPESTRE	0	UPL		2
Lepidium virginicum	0	FACU-		2
LYCHNIS ALBA	0	UPL		2
MELILOTUS ALBA	0	FACU		2
Monarda fistulosa	4	FACU		2
Muhlenbergia schreberi	0	[FACU]		2
NEPETA CATARIA	0	FAC-		2
Oenothera biennis	0	FACU		2
Panicum oligosanthes scribnerianum	4	[FACU]		2
Panicum villosissimum pseudopubescens	7	UPL		2
Panicum virgatum	5	FAC+		2
Physalis subglabrata	0	UPL		2
Phytolacca americana	1	FAC-		2
PLANTAGO LANCEOLATA	0	FAC		2
PLANTAGO MAJOR	0	FAC+		2
Populus deltoides	2	FAC+		2
Prunus virginiana	3	[FACU]		2
ROSA MULTIFLORA	0	FACU		2
RUMEX ACETOSELLA	0	[FACU]		2
RUMEX CRISPUS	0	FAC+		2
Salix interior	1	OBL		2
SEDUM SP.	0	UPL		2
SETARIA VIRIDIS MAJOR	0	UPL		2
Smilax tamnoides hispida	5	UPL		2
Solanum americanum	0	FACU-		2
SOLANUM CAROLINENSE	0	FACU-		2
Solidago altissima	1	FACU		2
Solidago gigantea	4	FACW		2
Solidago racemosa gillmanii	10	UPL	ST	2
Sorghastrum nutans	5	FACU+		2
Sporobolus cryptandrus	7	FACU-		2
SYRINGA VULGARIS	0	UPL		2
TARAXACUM OFFICINALE	0	FACU		2
Tilia americana	5	FACU		2
TRAGOPOGON DUBIUS	0	UPL		2
TRIODIA FLAVA	0	UPL		2
VERBASCUM BLATTARIA	0	FACU		2
VERBASCUM THAPSUS	0	UPL		2
Viola sororia	3	FAC-		2
Vulpia octoflora	4	FACU-		2
YUCCA SMALLIANA	0	UPL		2
Cyperaceae		OBL-UPL		2
Umbelliferae		OBL-UPL		2
Acer saccharinum	0	FACW		1
Acer saccharum	3	FACU		1
Amelanchier sp.		FACU-UPL		1
Anemone cylindrica	6	UPL		1
Aquilegia canadensis	6	FAC-		1
ARCTIUM MINUS	0	UPL		1
Asclepias tuberosa	7	UPL		1

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ASPARAGUS OFFICINALIS	0	FACU		1
Aster ericoides	5	FACU-		1
BERTEROA INCANA	0	UPL		1
Carex blanda	1	FAC		1
Carex granularis	4	FACW+		1
Carex vulpinoidea	2	OBL		1
CHELIDONIUM MAJUS	0	UPL		1
Chenopodium leptophyllum	5	[UPL]		1
COMMELINA COMMUNIS	0	FAC		1
Coreopsis tripteris	5	FAC		1
Cornus stolonifera	6	FACW		1
CORONILLA VARIA	0	UPL		1
Cyperus filiculmis	5	FACU-		1
Cyperus schweinitzii	5	[UPL]		1
Cyperus X mesochorus	5	UPL		1
Echinacea purpurea	3	UPL		1
EUPHORBIA DENTATA	0	UPL		1
Galium circaezans hypomalacum	7	[UPL]		1
Galium pilosum	10	UPL		1
HEMEROCALLIS FULVA	0	UPL		1
Juniperus virginiana crebra	2	FACU		1
Koeleria cristata	7	UPL		1
Leersia virginica	7	FACW		1
Liatris sp.		FAC--UPL	ST*	1
LYCORIS SQUAMIGERA	0	UPL		1
MIRABILIS NYCTAGINEA	0	UPL		1
Muhlenbergia frondosa	3	FACW		1
Muhlenbergia mexicana	5	FACW		1
Oenothera clelandii	7	[UPL]		1
Osmorhiza claytonii	3	FACU-		1
Panicum clandestinum	6	FACW		1
Parietaria pensylvanica	3	FACU		1
PHILADELPHUS SP.	0	UPL		1
PHLOX PANICULATA	0	FACU		1
Physalis heterophylla	3	UPL		1
PICEA PUNGENS	0	UPL		1
Pinus banksiana	9	FACU	SR	1
PINUS SYLVESTRIS	0	UPL		1
Polygonum scandens	1	FAC		1
Prunus pumila	8	UPL		1
Prunus serotina	1	FACU		1
Quercus rubra	7	FACU		1
RHAMNUS CATHARTICA	0	FACU		1
RHAMNUS FRANGULA	0	FAC+		1
Ribes cynosbati	5	UPL		1
Rudbeckia hirta	1	FACU		1
Solidago graminifolia nuttallii	3	[FAC]		1
Vitis labrusca	9	FACU		1
XANTHIUM STRUMARIUM	0	FAC		1

* Liatris sp. may be L. cylindracea, L. pycnostachya, or L. spicata. Liatris pycnostachya is State Threatened.

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Cardno JFNew

Prizim, Inc. – Porter Beach

September 4, 2012

SUMMARY OF ETR PLANT POPULATIONS

Rhus aromatica var. *arenaria*

Population	Coordinates	Associates	Notes
1	41.6602°N, -87.0686°W	*Celastrus orbiculatus, Juglans nigra, Lonicera* sp., *Parthenocissus quinquefolia, Prunus virginiana, Robinia pseudoacacia, Saponaria officinalis, Smilax tamnoides* var. *hispida, Solidago caesia, Ulmus pumila*	In degraded foredune, ~10'x10' area
2	41.6603°N, -87.0687°W	*Celastrus orbiculatus, Juglans nigra, Lonicera* sp., *Parthenocissus quinquefolia, Prunus virginiana, Robinia pseudoacacia, Saponaria officinalis, Smilax tamnoides* var. *hispida, Solidago caesia, Ulmus pumila*	In degraded foredune, ~10'x10' area
3	41.6608°N, -87.0682°W	*Ailanthus altissima, Ammophila breviligulata, Asclepias syriaca, Catalpa bignonioides, Celastrus orbiculatus, Equisetum hyemale, Populus deltoides, Ulmus pumila*	On foredune near beach
4	41.6607°N, -87.0683°W	*Ammophila breviligulata, Asclepias syriaca, Eupatorium serotinum, Morus alba, Oenothera biennis, Ulmus pumila*	Two plants ~6' apart (SW-NE oriented) on foredune near beach
5	41.6593°N, -87.0687°W	*Allium vineale, Ammophila breviligulata, Calamovilfa longifolia* var. *magna, Kuhnia eupatorioides* var. *corymbulosa, Lonicera* sp., *Panicum clandestinum, Robinia pseudoacacia, Saponaria officinalis*	One clump 10'x10' in dedgraded foredune
6	41.6592°N, -87.0686°W	*Ammophila breviligulata, Andropogon scoparius, Kuhnia eupatorioides* var. *corymbulosa, Poa compressa, Robinia pseudoacacia, Saponaria officinalis*	One shrub in degraded foredune
7	41.659°N, -87.0683°W	*Ammophila breviligulata, Celastrus orbiculatus, Lepidium campestre, Poa compressa, Ptelea trifoliata* var. *mollis; Saponaria officinalis*	One clump ~10'x10' on edge of sand prairie and degraded area
8	41.659°N, -87.0681°W	*Celastrus orbiculatus, Lonicera* sp., *Robinia pseudoacacia, Saponaria officinalis, Ulmus pumila*	One plant in degraded woods
9	41.659°N, -87.0678°W	*Alliaria petiolate, Celastrus orbiculatus, Celtis occidentalis, Galium aparine, Geum canadense, Lonicera* sp., *Poa pratensis, Populus deltoides, Ptelea trifoliata* var. *mollis, Robinia pseudoacacia*	One clump 15'x5' (N-S oriented) in degraded woods
10	41.6589°N, -87.0677°W	*Acer negundo, Ailanthus altissima, Celastrus orbiculatus, Geum canadense, Glechoma hederacea, Lonicera* sp., *Populus deltoides, Ptelea trifoliata* var. *mollis, Robinia pseudoacacia, Saponaria officinalis, Ulmus pumila*	One ~10'x10' clump in degraded woods
11	41.6588°N, -87.0676°W	*Acer negundo, Ailanthus altissima, Alliaria petiolata, Celastrus orbiculatus, Lonicera* sp., *Parthenocissus quinquefolia, Robinia pseudoacacia, Ulmus pumila*	Some plants in this population approach *Rhus aromatica* var. *aromatica*; up to 10' tall; ~20'x20' in degraded woods/former homestead
12	41.6584°N, -87.0674°W	*Ammophila breviligulata, Andropogon scoparius, Calamovilfa longifolia* var. *magna, Erigeron canadensis, Kuhnia eupatorioides* var. *corymbulosa, Lonicera* sp., *Monarda punctata, Robinia pseudoacacia*	One clump ~10'x10' in sand prairie
13	41.6579°N, -87.0688°W	*Ammophila breviligulata, Eupatorium serotinum, Lonicera* sp., *Saponaria officinalis, Tradescantia ohiensis, Vitis riparia*	One clump ~10x'10' in degraded foredune
14	41.6588°N, -87.0693°W	*Agropyron repens, Aster ericoides, Celastrus orbiculatus, Eupatorium serotinum, Festuca elatior, Lonicera maackii, Rhus radicans, Saponaria officinalis, Ulmus pumila, Vitis riparia*	Along ede of parking lot and road and in degraded woodland
15	41.659°N, -87.0689°W	*Ammophila breviligulata, Celastrus orbiculatus, Elaeagnus umbellata, Kuhnia eupatorioides* var. *corymbulosa, Lepidium campestre, Lonicera* sp., *Poa compressa, Populus deltoides, Ptelea trifoliata* var. *mollis, Opuntia humifusa, Rhus radicans, Robinia pseudoacacia, Saponaria officinalis, Vitis riparia*	Several large clumps in degraded woods/thicket on edge of decent quality foredune

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Prizim, Inc. – Porter Beach September 4, 2012

SUMMARY OF ETR PLANT POPULATIONS (CONTINUED)

Solidago racemosa var. *gillmanii*

Population	Coordinates	Associates	Notes
1	41.6605°N, -87.069°W	*Ammophila breviligulata, Celastrus orbiculatus, Elymus canadensis, Ptelea trifoliata* var. *mollis, Robinia pseudoacacia*	Four plants on dune at edge of parking lot in ~15' E-W oriented area
2	41.6607°N, -87.0689°W	*Ailanthus altissima, Ammophila breviligulata, Celastrus orbiculatus, Elymus canadensis, Morus alba, Populus deltoides, Robinia pseudoacacia, Saponaria officinalis. Syringa vulgaris, Vitis riparia*	~20 plants on degraded foredune
3	41.6609°N, -87.0686°W	*Ammophila breviligulata, Asclepias syriaca, Oenothera biennis, Robinia pseudoacacia, Ulmus pumila, Vitis riparia*	~75 plants along north-facing foredune near beach

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Prizim, Inc. – Porter Beach September 4, 2012

WILDLIFE OBSERVATIONS

SCIENTIFIC NAME	COMMON NAME
BIRDS	
Archilochus colubris	Ruby-throated Hummingbird
Baeolophus bicolor	Tufted Titmouse
Cardinalis cardinalis	Northern Cardinal
Carduelis tristis	American Goldfinch
Carpodacus mexicanus	House Finch
Corvus brachyrhynchos	American Crow
Cyanocitta cristata	Blue Jay
Dumetella carolinensis	Gray Catbird
Hirundo rustica	Barn Swallow
Larus argentatus	Herring Gull
Larus delawarensis	Ring-billed Gull
Picoides pubescens	Downy Woodpecker
Pipilo erythrophthalmus	Eastern Towhee
Poecile atricapillus	Black-capped Chickadee
Polioptila caerulea	Blue-gray Gnatcatcher
Progne subis	Purple Martin
Scolopax minor	American Woodcock
Sitta carolinensis	White-breasted Nuthatch
Spizella pusilla	Field Sparrow
Troglodytes aedon	House Wren
Zenaida macroura	Mourning Dove
INSECTS / SPIDERS	
Bombus sp.	Unidentifiable bumblebee
Epargyreus clarus	Silver-spotted Skipper
Libellula lactuosa	Widow Skimmer
Phyciodes tharos	Pearl Crescent
Pieris rapae	Cabbage White
Polygonia interrogationis	Question Mark
Sphecius speciosus	Cicada Killer
Sympetrum sp.	Unidentifiable meadowhawk
Tabanus sp.	Unidentifiable horsefly
	Unidentifiable cicada
	Unidentifiable mantid
MAMMALS	
Odocoileus virginianus	White-tailed Deer
Sylvilagus floridanus	Eastern Cottontail
REPTILES	
Cnemidophorus sexlineatus	Six-lined Racerunner

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High quality portion of beach/foredune community (high quality area 1).

High quality portion of beach/foredune community (high quality area 1).

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

File# 1205077.00

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Phone 574-586-3400 / Fax 574-586-3446
www.cardnojfnew.com

High quality portion of beach/foredune community (high quality area 1).

High quality portion of dry sand prairie community (high quality area 2).

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

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High quality portion of dry sand prairie community (high quality area 2).

Dry sand prairie community with scattered Lombardy poplar (*Populus nigra* 'Italica') (high quality area 2).

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

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High quality portion of dry sand prairie community (high quality area 3).

Degraded foredune.

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

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Old home site within degraded foredune.

Septic field within degraded foredune.

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
Prizim, Inc.
Porter County, Indiana

File# 1205077.00

Cardno JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.cardnojfnew.com

Degraded woods at south end of site.

Dwarf fragrant sumac (*Rhus aromatica* var. *arenaria*, State Rare).

Site Photographs
August 6, 2012
Porter Beach Biological Inventory
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Dune goldenrod (*Solidago racemosa* var. *gillmanii*, State Threatened).

Sea rocket (*Cakile edentula*, State Watch List).

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