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general management plan amendment
development concept plan/environmental assessment

draft
february 1990



WEST UNIT
INDIANA DUNES NATIONAL LAKESHORE • INDIANA

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE



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CONTENTS

PURPOSE OF AND NEED FOR THE PLAN	1
BACKGROUND	1
PURPOSE OF THE STUDY	1
Issues and Concerns	1
Specific Management Objectives	3
CONSIDERATIONS/CONSTRAINTS	4
PLANNING ALTERNATIVES AND ENVIRONMENTAL ANALYSIS	4
DESCRIPTION OF THE ENVIRONMENT	5
REGIONAL OVERVIEW	5
GEOGRAPHIC INFORMATION AND ANALYSIS	5
NATURAL ENVIRONMENT	8
Geology	8
Topography/Soils	8
Vegetation	8
Wildlife and Fish	10
Threatened and Endangered Species	11
Air Quality	12
Water Resources	13
Floodplains/Wetlands	14
Prime or Unique Farmlands	14
Coastal Zone/Shoreline Management	14
CULTURAL ENVIRONMENT	16
Archeological Resources	16
Historic Resources	16
INTERPRETIVE THEMES, FACILITIES, AND PROGRAMS	16
EXISTING DEVELOPMENT	17
West Beach	17
Paul H. Douglas Environmental Education Center	17
Inland Marsh	17
Trails	20
VISITOR USE	20
SOCIOECONOMIC ENVIRONMENT	20
Economics/Population	20
Regional Recreation Areas	24
RELATED PROJECTS	26
Proposed Gary Marina	26
Little Calumet River Commissions	26
Highway-Related Projects	27
Hazardous Waste Lagoon Site	27
Lake County Park Department	28
Lake Michigan Circle Tour	28
East Unit Transit Center	29
East Unit Campground	29

ALTERNATIVES	30
ALTERNATIVE 1	30
West Unit Access – 1980 GMP Recommendation	30
Transit Center and Shuttle Bus System –	
1980 GMP Recommendation	30
General Development	33
Accessibility	34
Management Zoning	34
Boundary Adjustments	34
Visitor Use Management	37
Interpretation	39
ALTERNATIVE 2 (PREFERRED ALTERNATIVE)	40
West Unit Access – Improve Existing Routes	40
Transit Center and Shuttle Bus System	43
General Development	43
Accessibility	44
Management Zoning	44
Boundary Adjustments	44
Visitor Use Management	44
Interpretation	44
ALTERNATIVE 3 (NO ACTION)	44
ALTERNATIVES CONSIDERED AND REJECTED	45
DEVELOPMENT PRIORITIES AND PHASING	45
DEVELOPMENT COST ESTIMATES	46
ENVIRONMENTAL CONSEQUENCES	48
ALTERNATIVE 1	48
Impacts on Natural Resources	48
Impacts on Cultural Resources	51
Impacts on Visitor Use	51
Impacts on Socioeconomic Environment	52
ALTERNATIVE 2 (PREFERRED ALTERNATIVE)	53
Impacts on Natural Resources	53
Impacts on Cultural Resources	55
Impacts on Visitor Use	56
Impacts on Socioeconomic Environment	56
ALTERNATIVE 3: NO-ACTION	56
Impacts on Natural Resources	56
Impacts on Cultural Resources	57
Impacts on Visitor Use	57
Impacts on Socioeconomic Environment	57
CONSULTATION AND COORDINATION	61
APPENDICES	
A: WEST UNIT – THREATENED AND ENDANGERED SPECIES	63
B: DESCRIPTION OF ALTERNATIVE 1 – MODIFIED 1980 GMP	
WEST BEACH ACCESS ROAD	67
C: DIAGRAMS OF RECOMMENDED INTERIM AND OVERPASS	
IMPROVEMENTS	69
SELECTED REFERENCES	74
PLANNING TEAM AND CONSULTANTS	76

MAPS

Region	2
Location	6
Land Use/Land Cover	9
Floodplains and Wetlands	15
Existing Facilities/Conditions	18
Regional Recreation Facilities	25
Alternative 1: West Beach Access and General Development	31
Boundary Adjustments	35
Alternative 2: West Beach Access and General Development	41

TABLES

1: Population Dynamics – Lake and Porter Counties, Indiana	22
2: Nonagriculture Wage and Salary Employment	23
3: Summary Comparison of Environmental Consequences	58

PURPOSE OF AND NEED FOR THE PLAN

BACKGROUND

Congress designated Indiana Dunes National Lakeshore as a unit of the national park system on November 5, 1966 (Public Law 89-761). It was one of the first areas proposed for national lakeshore status. The national lakeshore is located about 35 miles southeast of Chicago, Illinois, in the northwestern counties of Lake, Porter, and La Porte in Indiana (see Region map). It contains about 14,000 acres, including some 15 miles of Lake Michigan shoreline, and runs for nearly 25 miles along the southern end of Lake Michigan. The area is bordered by Michigan City on the east and Gary, Indiana, on the west. Miles of beaches, sand dunes, wetlands, and woodland forests combine to make the national lakeshore an area of traditional natural resources unique in an urban setting. The principal cultural resources include the Bailly Homestead (settled in 1822), the Chelberg Farm, five homes originally displayed at the 1933 Chicago World's Fair, and three experimental prefabricated houses built by the Lustron Corporation.

The natural resources of Indiana Dunes are immediately adjacent to several of the major transportation and utility corridors of the Midwest as well as one of the major steel-producing regions of the United States. Twenty-five percent of the total steel production in the U.S. is produced in northwestern Indiana.

In 1980, Indiana Dunes National Lakeshore was dedicated to the memory of Paul H. Douglas in grateful recognition of his leadership in the effort to protect, preserve, and enhance the natural, scientific, historic, and recreational value of the lakeshore for the use, enjoyment, and edification of present and future generations. The West Unit of the national lakeshore was designated as the Paul H. Douglas Ecological and Recreational Unit. For practical purposes, the unit will continue to be referred to as the West Unit in this document.

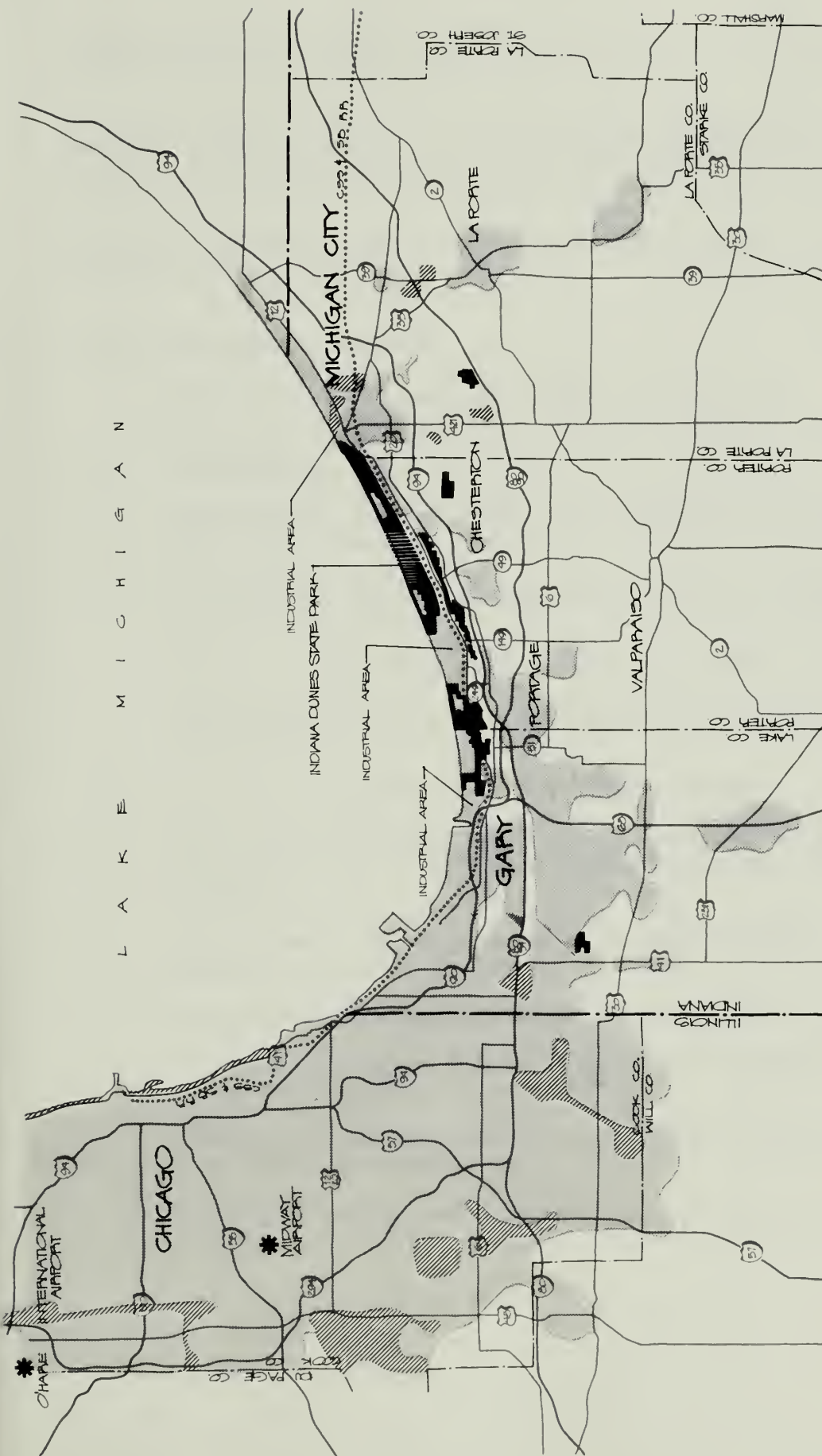
PURPOSE OF THE STUDY

The purpose of this *General Management Plan Amendment and West Unit Development Concept Plan/Environmental Assessment* is to update the February 1980 *General Management Plan* (GMP) considering the full range of issues that will affect the West Unit through the year 2000. These management issues include boundary adjustments to protect the valuable dune and wetland environments, use of lands adjacent to Lake Michigan and the Portage/Burns Waterway formerly used for hazardous waste disposal, access to West Beach, and impacts of increased traffic and visitation on adjacent communities. Issues that were not known or not a concern in the 1980 GMP are the need to coordinate access improvement proposals for West Beach with the proposed Gary marina and Marquette Park, the feasibility of the GMP West Beach access proposal because of its cost and possible environmental impacts, and planning for lands included in the national lakeshore since the GMP was approved – principally the "Gary pedestrian corridor."

Issues and Concerns

Access to West Beach. This document will review the approved 1980 GMP access recommendation to construct a new road from the intersection of State Route 51 (IN 51) and U.S. Highway 20 (US 20) across the Tolleston Dunes, over U.S. Highway 12 (US 12) and the railroad tracks, and onto West Beach by way of the abandoned Indiana Harbor Belt (IHB) right-of-way. The National Park Service will coordinate with the city of Gary to

L A K E M I C H I G A N



INDIANA DUNES NATIONAL LAKESHORE

URBAN DEVELOPMENT AREAS

MAJOR PUBLIC AND PRIVATE PARK AND OTHER

↑ NORTH

REGION

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facilitate access to the proposed Gary marina and Marquette Park in conjunction with West Beach access if possible and feasible.

West Unit Transit Center and Shuttle Bus Transportation. Current visitation patterns, availability of adjacent beaches, possible environmental impacts of new construction, and possible shuttle bus operational problems require the review of a West Unit transit center site and the feasibility of a shuttle bus system.

Boundary Adjustments. Resource protection and visitor facilities may require boundary adjustments in the West Unit.

Specific Management Objectives

- Create a lakeshore entrance and identity in the West Unit.
- Provide safe access to West Beach for the large volume of visitors who use the existing facilities.
- Reevaluate the location and scope of the proposed West Unit transit center and satellite parking facilities.
- Reevaluate the feasibility of using a shuttle bus to minimize use of private automobiles for access.
- Minimize visitor impacts in Gary's communities of Miller and Ogden Dunes.
- Coordinate with the city of Gary regarding access to the proposed marina and to Marquette Park.
- Consider land acquisition needs and boundary changes.
- Identify uses for the lands now owned by National Steel Corporation (industrial waste lagoons, unit I-C, tract number 09-117) which may become available for acquisition.
- Identify uses for the lands added to the national lakeshore since 1980 and generally known as the Gary pedestrian corridor.
- Provide hike/bike/cross-country ski and interpretive trails.
- Coordinate planning with regional transportation and recreation facilities and with all affected municipalities and organizations.
- Coordinate planning with the ongoing *US 12 Scenic Road Feasibility Study* and *Little Calumet River Corridor Study*.
- Make facility development recommendations and assign priorities for specific projects.

CONSIDERATIONS/CONSTRAINTS

The County Line Road IHB bridge and vehicle access routes to West Beach are currently being designed and will be replaced in 1990. All alternatives will be compatible with the new bridge and entrance ramps.

All alternatives will be integrated with other ongoing projects, including the *US 12 Scenic Road Feasibility Study* and the *Little Calumet River Corridor Study*.

The GMP amendment and West Unit DCP will propose facilities and concessions where appropriate for the convenience of park visitors.

PLANNING ALTERNATIVES AND ENVIRONMENTAL ANALYSIS

An environmental assessment has been prepared that includes alternatives and potential impacts on the natural and cultural resources, visitor use, and socioeconomic environment. Special attention is given to endangered species and wetlands that could be affected by proposed development actions. Planning activities have been coordinated with the Indiana State Historic Preservation Officer and the Advisory Council on Historic Preservation. After the environmental assessment has been reviewed, an evaluation of the impacts will be made and a "Finding of No Significant Impact" or a "Notice of Intent to Prepare an Environmental Impact Statement" will be issued.

DESCRIPTION OF THE ENVIRONMENT

REGIONAL OVERVIEW

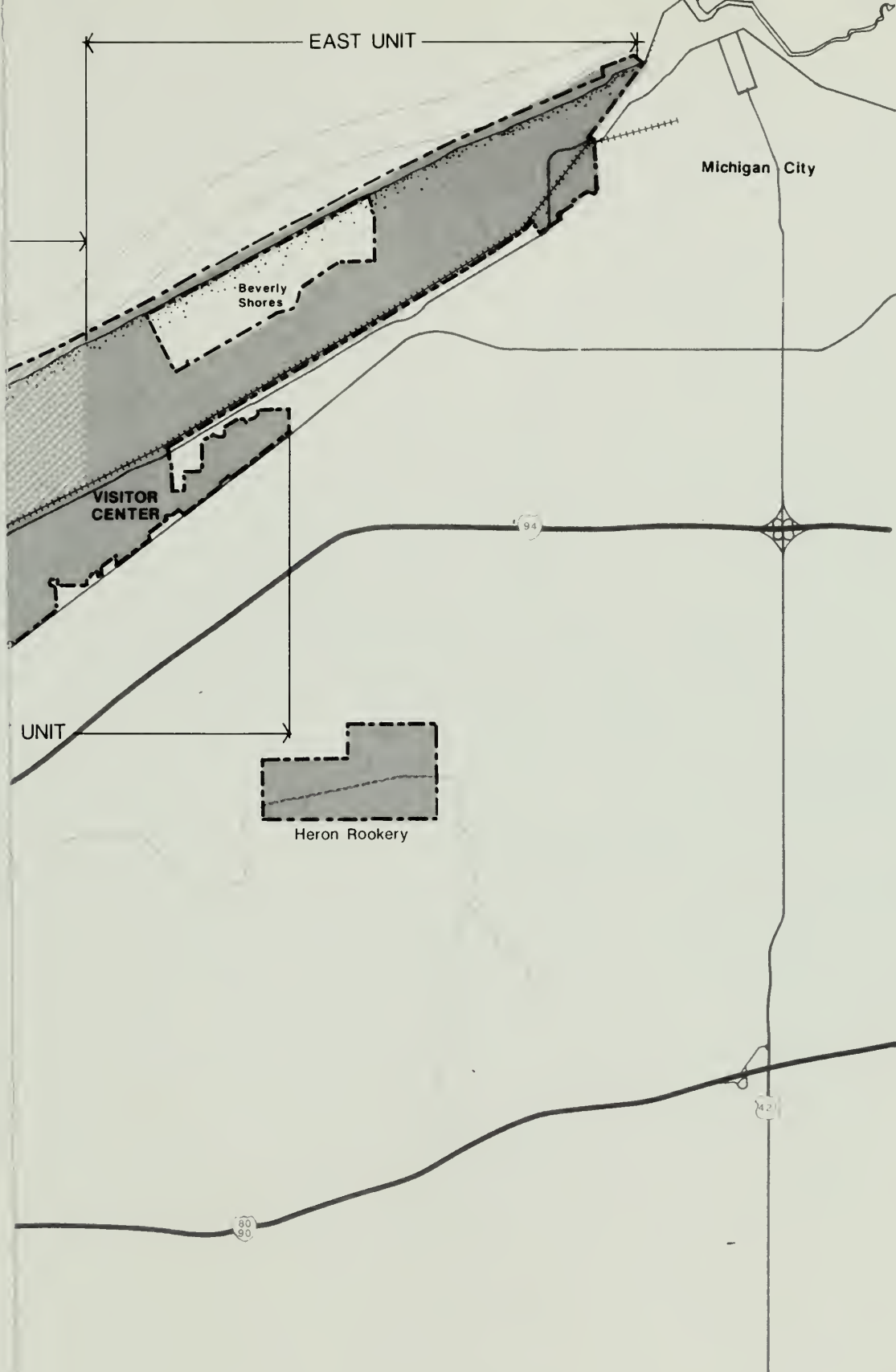
Indiana Dunes National Lakeshore lies within northwest Indiana's industrial-urban community. Within or adjacent to the lakeshore's boundary are residential communities, open rural areas, light and heavy industry, and agricultural lands. Natural wetlands, dune bluffs and ridge complexes, vegetational succession, climax oak forests, and long beaches typify the visual qualities of the national lakeshore. A complex system of county, state, and interstate roads serving both local, residential, and heavy industrial traffic also exists within the national lakeshore. Numerous railroads traverse the area carrying manufactured products, commuters and Interstate passengers. Automobile travelers also use the national lakeshore and surrounding areas.

The West Unit contains many of the visual characteristics found throughout the lakeshore including both natural and disturbed conditions. Miller Woods and Tolleston Dunes exemplify the unique dunes vegetation and the pristine environment. Inland Marsh, Long Lake wetland, and Long Lake typify the wetland system of the West Unit. West Beach, its shorelines, and its sparsely vegetated, sloping foredunes display the openness and beauty of the lakeshore scenery. USX Corporation (formerly U.S. Steel), National Steel (Midwest Division), Bethlehem Steel, Northwest Indiana Public Service Company (NIPSCO), and the Port of Indiana dominate the industrial complexes along the Lake Michigan shore. The small, isolated communities of Miller and Ogden Dunes lie within the West Unit. The Land Use map illustrates the land use patterns both in the West Unit and throughout the national lakeshore.

GEOGRAPHIC INFORMATION AND ANALYSIS

A geographic information system (GIS) is a variety of computerized techniques that copy, transfer, manipulate, combine, and analyze various types of mapped information. Geographic information systems have been used to compile and analyze information in the preparation of this document. Through the assistance of the GIS unit of the National Park Service, a satellite "SPOT" digital image of northwestern Indiana was used along with other mapped information to provide accurate, up-to-date information about the West Unit and northwestern Indiana. The original SPOT image was taken in August 1988. Other GIS mapped information included transportation (roads, railroads, and utility corridors), hydrography (water bodies, ponds, lakes, and streams), and political boundaries. In addition, the National Park Service incorporated digital wetlands information from the U.S. Fish and Wildlife Service (USFWS) and floodplain delineations from the National Flood Insurance Program with the other basic mapped information. NPS staff also added regional recreation areas from existing sources.

With this information the following maps were compiled: land use/land cover, floodplains and wetlands, and regional public lands. Based on these maps, the following analyses were conducted: existing use and character of lands recommended for boundary adjustments, acres of wetlands that would be affected by various alternatives, possible "greenline" corridors that could connect public recreation lands.

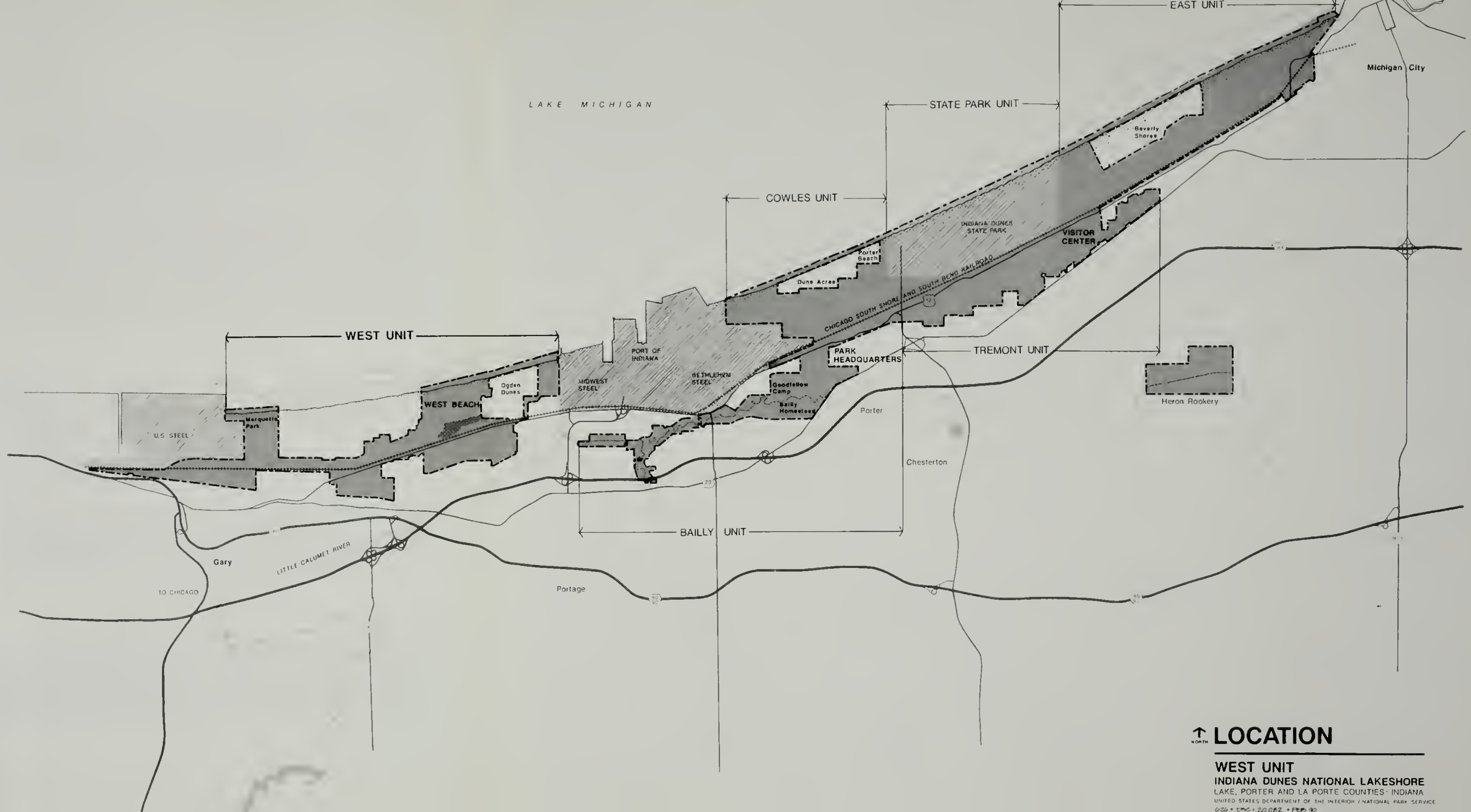


LOCATION

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↑ NORTH LOCATION

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NATURAL ENVIRONMENT

Geology

Indiana Dunes National Lakeshore is unique in its diversity of geologic features and terrain. The combination of glaciers, wind, and water have created a moraine (glacial till and outwash materials) topography, a freshwater lake, sand beaches, dunes, and bogs. The thick glacial drift deposits of the Wisconsinian age that mantle the entire area consist of till, clay, silt, sand, gravel, muck, and peat. The underlying bedrock layer consists of well-consolidated limestone, dolomite, sandstone, and shale.

The national lakeshore is the remnant of a lakeshore environment resulting from the retreat of the last great glacier some 11,000 years ago (NPS 1980). The park landscape resulting from the glacial retreat includes seven major Lake Michigan shoreline/lake level stages. From the present beach ridge these stages (extending back in time and inland) are the Algoma, the Nippissing, the Algonquin, the Tolleston, the Calumet, and the Glenwood Lakeshore stages. It represents the most completely preserved example of Great Lakes geological evolution in the Great Lake Basin (NPS 1988a). The Tolleston stage is best represented in the national lakeshore at the Inland Marsh area. The crest of the Calumet dune follows US 12 in eastern Indiana Dunes National Lakeshore. The Glenwood formation lying south of the national lakeshore extends northward through portions of the Bailly and Tremont units.

Topography/Soils

Most of the national lakeshore lies within the Calumet lacustrine plain. The dunes of the present shoreline form an arc around the Lake Michigan beach. Sand dunes rise to almost 200 feet in a series of ridges and valleys. Most of the upland dunes are stabilized by vegetation. Generally, the depressions between the dunes are wetlands or former wetlands that have been artificially drained.



The ancient dunes and wetlands associated with the Tolleston and Calumet shorelines account for many of the topographic features along the southern boundary of the park.

The soils are a direct result of the geological history of the area interacting with climate and vegetation. Clay-rich soils occur in the southern portion of the park underlain by glacial moraine and lake deposits. Over 95 percent of the soils of the dune ridges contain sand with little clay. The interdunal basin area wetland soils contain higher levels of organic material than adjacent dune ridges. Soil surveys for Lake and Porter counties, which includes the West Unit of the national lakeshore, have been completed and published by the U.S. Department of Agriculture, Soil Conservation Service.

Vegetation

The vegetation at Indiana Dunes National Lakeshore is one of its most significant features and represents one of the primary reasons for its establishment (NPS 1987b). Vegetation surveys and inventories completed within the national lakeshore provide baseline data. A 1989 revision of the lakeshore's vegetation (plant community) classification system and associated GIS mapping has resulted in a new comprehensive vegetation data base. The Land Use/Land Cover map identifies the vegetation types occurring within the West Unit and the general national lakeshore area.



	Water		Sand
	Terrestrial Shrub		Residential
	Agriculture/Grass		Mixed Commercial/Residential
	Shrub/Marsh/Forested Wetlands		Commercial
	Upland Forest		Industrial

NOTE: These maps will be redrawn for the draft document with clear colors and symbols.

LAND USE/LAND COVER

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The national lakeshore displays diverse vegetation, represented by more than 1,130 different species of native vascular plants. The vegetation includes plant associations of the eastern deciduous forest, boreal forest, Atlantic Coastal Plain, and prairie species. Brief descriptions of the general plant communities/succession that have developed at Indiana Dunes National Lakeshore and that can be generalized for the West Unit are given below.

Upland Forest – Forests growing on well-drained areas that are rarely, if ever, flooded or covered with standing water. These forests are found on dunes or the uplands of the glacial moraine. The tree, shrub, and herb species found in these forests are often completely different from those found in lowland forests.

Lowland Forest – Forests growing in areas that are periodically flooded, such as river and stream floodplains and drainage valleys, or in areas where standing water is present year-round. Lowland forests often border marshes, ponds, and shallow lakes and may cover extensive areas between two series of dune ridges. Low swales between forested dunes are usually wet and contain lowland forest.

Terrestrial Shrub – Terrestrial shrub thickets usually have formed as a result of clearing forests or abandoning farmland (on the moraine) or suppressing fires (in the dunes). Shrub thickets on the moraine could be considered an intermediate stage between an old field and a young forest. On the dunes they are intermediate between open oak savannas and closed oak forests.

Prairie – A prairie is a grass and herb dominated community with a much higher diversity of plants than a foredune community. Prairies are found in areas that have never been disturbed by sand mining and that show no evidence of having recently been an active dune or blowout. They are generally older and more well developed than foredune communities. True prairies at the Indiana Dunes are found only in the dunes and are composed of native species rather than Eurasian weeds or old field species. Prairie flora makes up the herb component of the savannas.

Wetland Shrub – Wetland shrub thickets grow in areas that have standing water or wet soils year-round. They usually contain different shrub species than a terrestrial shrubland. Wetland shrub thickets often occur as clumps or islands of shrubs scattered in the middle of marshes or along their edges. If shrub cover is less than 50 percent, the area is considered marsh. Around the Indiana Dunes, many drained marshes are now becoming wetland shrub thickets as shrubs and young trees invade.

Marsh – Herb-dominated wetlands almost always contain abundant stands of cattails or giant reed grass and sedges. Marshes are most extensive in the low-lying wetlands between two series of dune ridges, though small pockets of marsh may occur in the swales between two dunes, along river floodplains, or around pond edges.

Wildlife and Fish

Wildlife species within Indiana Dunes National Lakeshore are diverse due to the variety of habitats. Birdlife is extremely varied, with more than 300 species observed. The most common inland birds are blue jay, robin, red-eyed vireo, mourning dove, downy woodpecker, flicker, grackle, and song sparrow. Proximity to the Lake Michigan shoreline makes the park an especially important feeding and resting area for migrating land and water birds. Wetland bird species include red-winged blackbird and long-billed marsh wren.

Populations of terrestrial species appear to be stable. Common terrestrial animals present include white-tailed deer, beaver, woodchuck, raccoon, cottontail rabbit, fox and red squirrel, chipmunk, meadow vole, and white-footed mouse. Common reptiles and amphibians occurring include garter snake, hognose snake, Fowler's toad, and red-backed salamander. The leopard frog and spring peeper are the most common amphibians present in the wetland communities.

Populations of aquatic species are limited in the West Unit area. Although there are no major streams, creeks, or tributaries, the scattered interdunal ponds may contain isolated exotic panfish species. Primary invertebrates include the crayfish and a host of waterbugs and water-loving insects.

Threatened and Endangered Species

Both state-listed and federally protected threatened and endangered plant species occur in the West Unit of Indiana Dunes National Lakeshore. Federally protected threatened species include the dune (sand) thistle (*Cirsium pitcheri*), category 2 beach (sand fragrant) sumac (*Rhus trilobata* var. *arenaria*), and Prairie fame-flower (*Talinum rugospermum*). (A category 2 candidate species is one for which the USFWS has substantial information indicating that the species could possibly be threatened or endangered but lacks substantial data on vulnerability or threats.) The sand thistle occurs in the Miller Woods and West Beach areas. Its potential habitat is found throughout portions of the West Beach and Miller High Dunes area. Its occurrence in Miller Woods is considered scattered, while in West Beach its occurrence is frequent. The sand fragrant sumac is also known to occur in the Miller Woods and West Beach areas, but the occurrences are scattered. The Prairie fame-flower occurs within the Tolleston Dunes area, and its occurrence is considered rare.

Numerous state-listed threatened and endangered plant species occur within the West Unit. Appendix A lists both the state-listed and federally protected plant species known to occur in the West Unit. (Note: All state-listed threatened, endangered, or rare plant species are not protected by state statutes.) Although state-listed plants are not protected by state statutes, except on state nature preserve lands, the 1980 GMP states that "The effort will be to protect and preserve these species and work to assure their success in the Indiana Dunes ecosystem." Field studies on the status of Indiana endangered, threatened, and special concern plant species (Bowles 1984, 1988) support arguments that the originally diverse flora of the Indiana Dunes National Lakeshore has declined in part due to fire protection. The studies showed that most threatened and endangered species within the lakeshore were found to be in a state of decline (NPS 1987a). It has been estimated that the number of plant species thought to be extirpated from the state has more than tripled in the past century primarily due to natural habitat destruction.

Several federally protected threatened, endangered, and candidate (category 2), animal species are known to occur or potentially occur in the West Unit (see appendix A). The federally endangered Indiana bat (*Myotis sodalis*), while not having been observed at Indiana Dunes, does have the potential to exist in habitat along the Little Calumet River. The endangered peregrine falcon (*Falco peregrinus*) does not nest in Indiana on a regular basis, but its official range includes the Miller Beach area for use in frequent feeding and resting activity. The Eastern massasauga snake (*Sistrurus catenatus*) has been recorded recently as occurring in Lake and Porter counties and therefore may potentially be present in the West Unit.

Appendix A identifies both state-listed and federally protected threatened and endangered animal species present, known to occur, or likely to occur in the West Unit. All vertebrate

and invertebrate animal species are protected by the Indiana Fish and Wildlife Act and enforced by the Indiana Department of Natural Resources, Fish and Wildlife Division.

Air Quality

Air quality in the vicinity of the Indiana Dunes National Lakeshore is affected to a major extent by the urban influences of the Chicago metropolitan area, and somewhat more directly by the adjacent urban and industrial development in and around the cities of East Chicago, Hammond, and Gary. Many different industries have located in this area, with a major emphasis on steel mills and electric power generation plants. Both the steel mills and the power plants use large quantities of coal for fuel, causing the emission of significant quantities of sulfur dioxide and particulates. In addition to fuel use, steel mills can also be a source of particulates, organic emissions from coke ovens, and other pollutants.

National ambient air quality standards (NAAQS) were established under the Clean Air Act, as amended in 1977. The national lakeshore has been designated a class II area, which means that moderate increases in ambient pollution levels will be tolerated, but the pollution levels must remain within the NAAQS. NAAQS consist of two types – primary, for protection of human health, and secondary, for protection of human welfare.

The National Park Service has established a national air quality research and monitoring program that includes a data collection station at park headquarters. Other air quality monitoring stations in the lakeshore area are located in Ogden Dunes (operated by IDEM) and on Bethlehem Steel Corporation property.

An additional NPS program, the air quality biological effects research program found that biological resources have been affected by air pollutants at Indiana Dunes. Research indicates that there has been a decrease in lichens known to be sensitive to sulfur dioxide (NPS 1988b). The most common air pollution effect on biological resources is foliar (leaf) injury due to ozone. Foliar injury to vascular plants from ozone has been documented as occurring on several species, including eastern white pine, jack pine, red oak, sycamore, yellow poplar, white ash, black cherry, quaking aspen, box elder, willow, basswood, elderberry, sunflower, milkweed, Joe-pie weed, evening primrose, frost grape, and poison ivy. Visible pollution injury to the white and jack pines appeared widely throughout the national lakeshore (Armentano 1984).

A criteria pollutant monitoring program has been established at Indiana Dunes by the National Park Service. The program evaluates pollutant sources of ozone and sulphur dioxide (SO₂). Primary sources of ozone pollution are organic materials and oxides of nitrogen from motor vehicles, while sulphur dioxide sources are primarily of industrial origin. During 1984-86, ozone levels exceeded the primary NAAQS on four days during 1984 and on no days during 1985 or 1986 at the national lakeshore. Currently, data are insufficient to show a significant trend over time of ozone levels either increasing or decreasing in the lakeshore area. Sulphur dioxide levels monitored during 1980-87 indicated levels about 20 to 40 percent below the primary NAAQS at Indiana Dunes National Lakeshore (NPS 1988b).

The airborne deposition of toxic trace elements has been measured at Cowles Bog. While very high, the soil concentrations of these elements do not exceed Environmental Protection Agency (EPA) standards. These depositional rates may be extrapolated to be similar to most of the national lakeshore (Cole et al. 1989).

Based on EPA air quality evaluations, designations of attainment or nonattainment for air quality classification have been made. An attainment designation means that measurements

are within the limits specified by the NAAQS and that no adverse health effects are expected to occur. A nonattainment designation indicates that measurements of a particular pollutant sometimes exceed the national standards and that causes a risk of adverse health effects. For particulates the EPA has designated portions of Lake and Porter counties, including most of the lakeshore areas between the shoreline and I-94, as nonattainment. For sulphur dioxide, the EPA established a nonattainment designation for a portion of Lake County along the lake and the national lakeshore area. Porter County was listed as "cannot be classified." For ozone, the most difficult and widespread air pollution problem in the region, Lake and Porter counties have been designated as nonattainment. La Porte County have been designated as nonclassified. No air quality designation for carbon monoxide has been made by the EPA for the Lake, Porter, and La Porte county area. The EPA has approved the Indiana State implementation plan for carbon monoxide, and the standard should be attained in a few years.

Air quality can be expected to improve in the lakeshore area within the next few years. Carbon monoxide, particulates, and sulfur dioxide levels should be reduced as current and future state implementation plans are carried out. Attainment of the ozone standard will require many years of effort since the lakeshore is tied with the entire Chicago metropolitan area, which is among the three or four worst ozone problem areas in the nation (NPS 1989a).

Water Resources

Major surface water resources in the West Unit include the adjacent Lake Michigan, Grand Calumet River, Portage/Burns Waterway, and Long Lake. Other water resources consist primarily of Long Lake wetland, interdunal ponds, and scattered wetlands. Many of the hydrological processes in and surrounding the lakeshore have been significantly altered by agricultural and industrial development of the area. Development alterations include stream channelization, filling of wetlands, ditching, dikes, and dewatering. The general availability of both surface water and groundwater is important for maintaining the wetlands throughout the national lakeshore. A *Water Resources Baseline Inventory and Assessment* (Dolak 1986) has been completed for the lakeshore.

The lakeshore overlies an extensive groundwater reservoir. The general groundwater gradient is towards Lake Michigan. Groundwater gradients can and are very localized in the lakeshore and surrounding areas. The groundwater table generally varies from 0 to 45 feet below the surface (NPS 1979).

Water quality in the national lakeshore is important for maintaining the aquatic and wetland communities and providing for the visitor health and safety. The lakeshore has two water quality programs – beach bacteria monitoring and stream monitoring. The beach monitoring program in the West Unit includes the beach sites of West Beach, Ogden Dunes, and Lake Street. In general, the beaches are well within the water quality standards of IDEM. In 1989 West Beach was closed only one day. The stream monitoring program addresses the Little Calumet River. With neighboring industrial, agricultural, and residential activities present, major water pollution concerns include bacterial contamination of swimming beaches, road salt contamination, parking area and highway runoff, industrial landfill contamination (especially in Miller Woods), sewage and industrial effluent outfalls, treatment ponds, and agricultural runoff. Many of the pollution sources are outside NPS jurisdiction.

Baseline water quality and water chemistry characteristics have been established for some areas within the national lakeshore. The U.S. Geological Survey has in the past, under an annual contract, undertaken a water quality monitoring program for Indiana Dunes National

Lakeshore. In FY 1990 the national lakeshore will begin a long-term, periodic water quality monitoring program. Past research and studies indicate high levels of chemicals, such as PCBs and nitrates, in some surface water and groundwater within the lakeshore. The Geological Survey has found high levels of heavy metals and some increased arsenic and boron levels from past records.

Floodplains/Wetlands

Floodplains within the West Unit of Indiana Dunes National Lakeshore for the 100- and 500-year flood levels, based on county flood insurance rate maps and flood insurance studies, are identified on the Floodplains and Wetlands map. The floodplain data supplied through the Federal Emergency Management Agency (FEMA) is the basis for the 100/500-year floodplain levels identified. FEMA serves as the official agency and authority for designation of flood level.

FEMA has adopted a 100- and 500-year flood level for identification of flood hazard areas along open-coast shorelines. The Great Lakes open-coast flood levels for the 100- and 500-year levels along the Indiana Dunes shoreline are elevations of 585.0 feet mean sea level and 585.9 feet mean sea level, respectively. These open-coast flood levels are not a factor in the development actions in the West Unit area.

Prime examples of wetlands in the West Unit are Long Lake wetland, Inland Marsh, the Tolleston Dunes area, and the interdunal ponds in the Miller Woods area. Variations in water levels seasonally and annually may result in wetlands changing from one wetland form to another. Classification and designation of wetlands in the West Unit and surrounding lakeshore area are based on the USFWS National Wetland Inventory (NWI) maps, and identified on the Floodplains and Wetlands map. Major wetland systems delineated for the lakeshore are palustrine, riverine, and lacustrine.

Prime or Unique Farmlands

No soils in the West Unit and surrounding areas of the lakeshore within Lake and Porter counties qualify for designation as prime or unique farmland according to U.S. Department of Agriculture, Soil Conservation Service, criteria and standards.

Coastal Zone/Shoreline Management

Prior to 1982 the state of Indiana had a coastal zone management program, but funding reductions caused its termination. The state is currently in the process of reestablishing the coastal zone management program.

In June 1986 a *Shoreline Situation Report* containing shoreline erosion data/analysis was completed by Purdue University. The purpose of this report was to identify area(s) of high rates of erosion potential and to develop and introduce state legislation for future state law concerning shoreline setback requirements for development along the shoreline. See the 1986 and 1988 Purdue University reports for a detailed discussion of lakeshore erosion. The National Park Service will continue to monitor shoreline erosion. GMP amendment alternatives will not affect shoreline erosion.



Marsh



Shrub



Lowland/Wet Forest

NOTE: These maps will be redrawn for the draft document with clear colors and symbols.

FLOODPLAINS AND WETLANDS

WEST UNIT

INDIANA DUNES NATIONAL LAKESHORE

LAKE, PORTER AND LA PORTE COUNTIES • INDIANA

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

CULTURAL ENVIRONMENT

Archeological Resources

Archeological artifacts recovered from the Porter County area are typical of cultures from the Paleo-Indian period, 12,000 to 9,000 years B.P. Prehistoric sites have been found within the Indiana Dunes National Lakeshore boundaries, sites that date to the Middle Woodland period, 200 B.C. to A.D. 500. The prehistoric record of the native American occupancy of the southern shores of Lake Michigan is poorly known. An account written in 1679 reported a village of Miami, Mascouten, and Wea Indians living near the portage of the St. Joseph and Kankakee rivers, less than 50 miles away from the lakeshore. The Jesuit priest Claude Jean Allouez reported Potawatomi groups on the western shores of Lake Michigan in 1667. He indicated that they subsisted on the fruits of hunting, fishing, and cultivation of maize. They used their surplus maize for trade with other groups. Evidently, the Potawatomi began to migrate southward during the last part of the 17th century. By the late 18th century, they inhabited the entire region surrounding the southern end of Lake Michigan.

To date, only limited archeological studies have been conducted at Indiana Dunes National Lakeshore. Included among these studies were a field appraisal by Honerkamp (1968), a small excavation at Bailly Homestead by Limp (1974), a study at Bailly by Munson (1976), and an assessment at West Beach by Johnson (1974). All of the national lakeshore, except Miller Woods and the lands added as part of Public Law 96-612 (1981), has received reconnaissance level survey coverage during which 13 archeological sites were recorded. None of these sites have been evaluated through subsequent testing. Yet the finding of 13 widely distributed sites indicates that archeological material is present within the lakeshore and is currently obscured by sand and/or dense vegetation. The East Unit Transit Center site was surveyed in 1984 by the Department of Anthropology, Northwestern University. The most recent archeological survey in the park was conducted in 1989 for the East Unit Campground site.

Historic Resources

There are no cultural resources in the West Unit that are either listed on or eligible for inclusion on the National Register of Historic Places. The old Gary railroad station was considered for the register as part of a package nomination for the entire Chicago, South Shore, and South Bend railway line. It was rejected both as an individual property and as part of the extended lineal historic district. Two properties in Marquette Park (Gary) were submitted for determinations of eligibility to the register, and the decisions on them have not yet been made. Once submitted for a determination of eligibility, they would be considered eligible for the register until determined otherwise. The city of Gary owns and maintains these properties.

INTERPRETIVE THEMES, FACILITIES, AND PROGRAMS

Two of the lakeshore-wide themes are particularly pertinent in the West Unit: (1) ecological succession is a dynamic process that is a major factor in creating the dune landscape and (2) geologic events, particularly glaciation, laid the foundation for the dunes and the entire Great Lakes.

The West Beach visitor center contains information and exhibits on natural history. The bathhouse contains information and temporary exhibits on a variety of topics. The West

Beach succession trail is a 1-mile, self-guiding trail (mostly boardwalk) from the parking lot to the beach. There are eight stops along the trail, and a brochure explains dune ecology and succession.

The Paul H. Douglas Center for Environmental Education offers environmental education programs by reservation on a broad range of topics. The center contains information, three learning centers, an auditorium with audiovisual equipment, a classroom with computer lab and interactive exhibits, and a lab with microscopes and live animal displays. Public use is limited to one day per week and for scheduled public programs.

Interpretive programs in the West Unit include some natural history programs for the general public and year-round science seminars for the general public and students. The greatest emphasis in the West Unit is on environmental education programs originating at the Paul H. Douglas Center for Environmental Education. In 1988, 10 of 22 different programs covering a wide variety of natural and cultural history topics were offered in the West Unit. These programs are designed for children from preschool through high school, as well as adults.

EXISTING DEVELOPMENT

West Beach

West Beach is an area of just over 1 square mile located northeast of the intersection of US 12 and County Line Road. It is bounded by the Miller neighborhood on the west, Ogden Dunes on the east, the South Shore and Conrail railroads on the south, and Lake Michigan on the north. Within West beach there are several concessioner-operated facilities, including the 615-car parking lot, fee collection booths, a bathhouse, and a snack bar. The National Park Service maintains the more than 1 mile of beach, 3 miles of roadway, and parking lot pavements, operates the visitor information center and associated services and interpretive programs, provides picnic and trail facilities, and manages the natural resources.

Paul H. Douglas Environmental Education Center

The Douglas Environmental Education Center is located on Lake Street in Gary on the narrow band of NPS land bounded by the abandoned IHB rail right-of-way on the north and the Conrail tracks on the south. Surrounding land uses include residential development to the north and south, and NPS lands on the east and west. The Douglas Center development spans Lake Street by means of a pedestrian bridge that connects the parking lot on the east side with the Douglas Center on the west. Immediately north and west of the Douglas Center are 1.4 miles of interpretive, hiking, and cross-country skiing trails through natural resource areas of wetlands, lakes, dunes, and woodlands. Additional trails are proposed to extend north to Lake Michigan through Miller Woods and west along the Gary pedestrian corridor to Gary.

Inland Marsh

Inland Marsh is about 1 mile long by 1/4 mile wide and extends along the south side of US 12 from County Line Road on the west to Old Stagecoach Road on the east. Adjacent land uses include the West Beach area on the north, sand mines and minor commercial/residential development on the east, agriculture on the south, and vacant land or sparse residential on the west. Development at Inland Marsh consists of parking for



--- PARK BOUNDARY

■■■ HIKING TRAIL

Ⓟ PARKING

EXISTING FACILITIES/ CONDITIONS

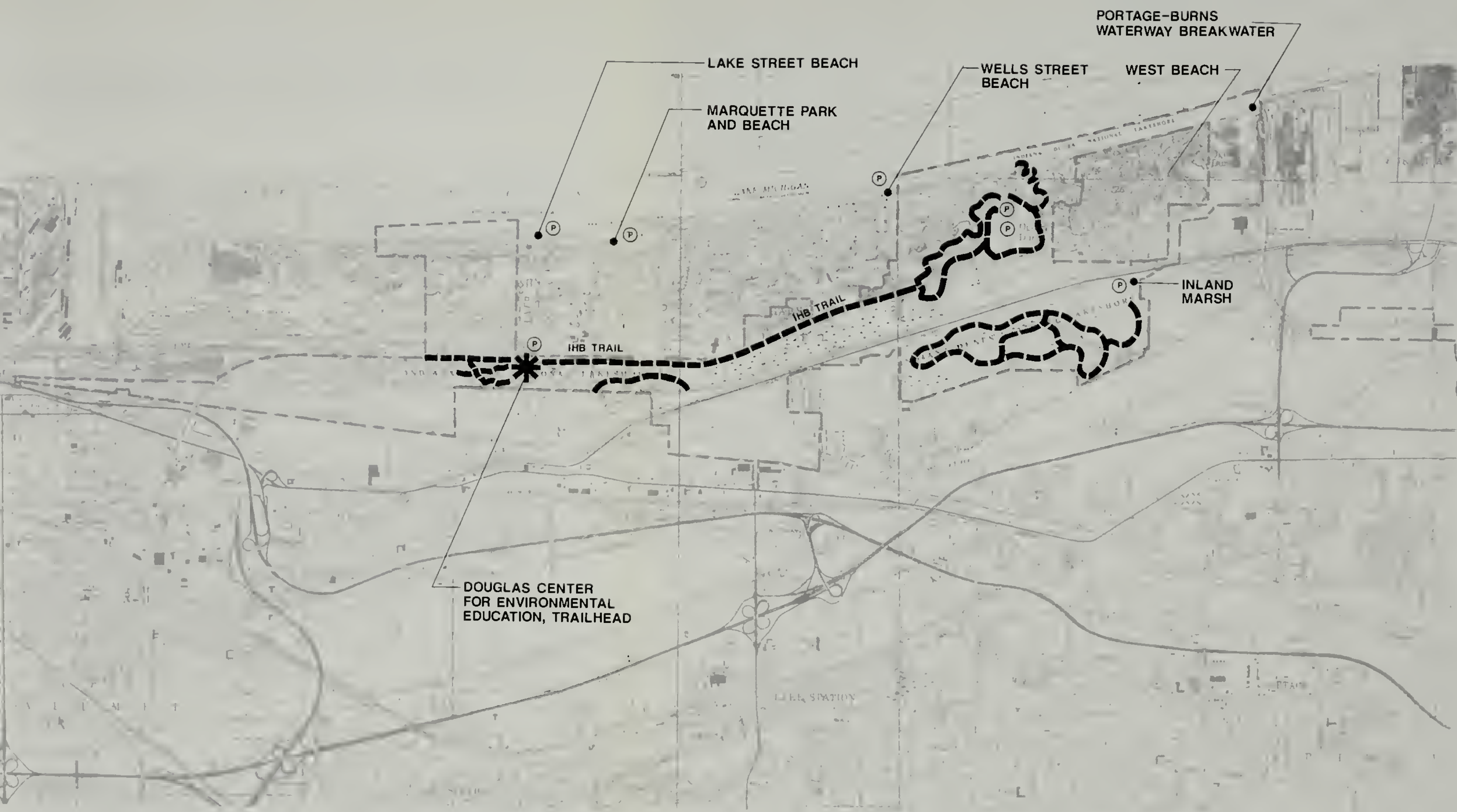
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about 20 cars, portable toilets, and nearly 5 miles of trails for hiking, cross-country skiing, and other uses, but excluding motor vehicles or bicycles. There are no concessioner-operated facilities, NPS staffing, utility services currently extended at this site.

Trails

All existing trail development in the West Unit is contained within the West Beach, Miller Woods, and Inland Marsh development areas. There are several existing proposals to extend NPS trails to the city of Gary, Lake Michigan, and the East Unit. If all the proposed trails for the West Unit were built, they would add between 15 and 20 miles of trails to the existing 9.4 miles, totaling 25 to 30 miles at full development as outlined in the 1984 *Trail Plan*. The trails would serve hiking, interpretive, and cross-country skiing uses throughout the West Unit. There are also trail proposals to serve bicycles, but these bike trails are confined to the vicinity of access roads in the 1984 plan.

VISITOR USE

The West Unit of Indiana Dunes National Lakeshore includes some of the most intensively used recreation areas within the park. West Beach, which stretches for over a mile along the shore of Lake Michigan, is a very popular recreation destination for residents of northern Indiana and the southern Chicago metropolitan area. A license plate survey conducted in the West Beach parking areas during the summer of 1989 found that over 38 percent of vehicles were registered to persons from the Gary, Indiana, area and 50 percent from south-suburban Chicago. The accompanying pie chart summarizes the results of the 1989 survey.

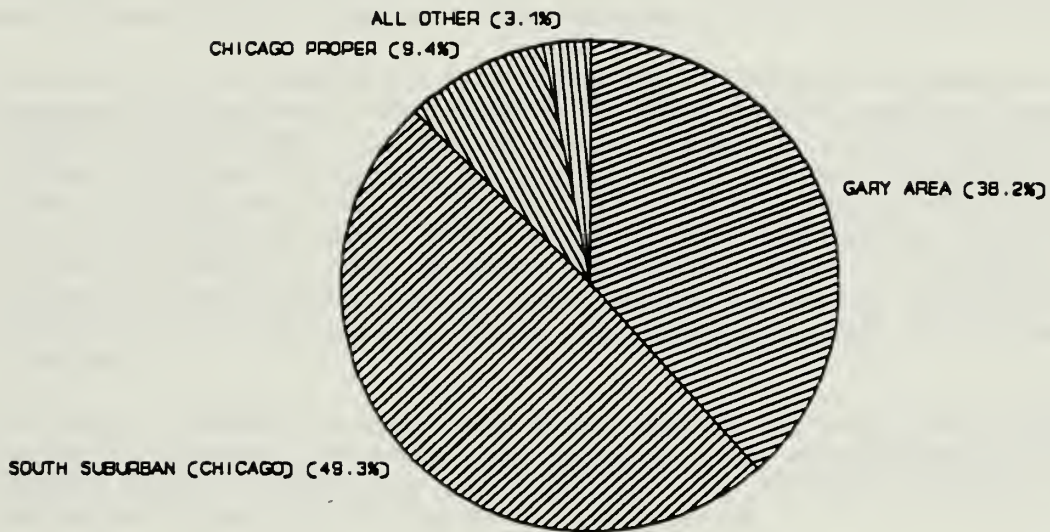
Swimming, sunbathing, and picnicking are among the most popular activities at West Beach. Recreationists can also hike established trails to explore sand dunes, woods, and prairies. Visitation to the West Unit has averaged over 344,000 people per year for the past four years. In 1988 total visitation to this unit represented about 18 percent of the annual visitation for the lakeshore. Over 62 percent of West Unit visitation occurs during June, July, and August. Visitation to the beach for these three months has averaged about 213,000 per year for the past eight years. Summer visitation to West Beach has grown 44.5 percent between 1981 and 1988 (summer visitation for the entire national lakeshore increased 50.6 percent over the same period). The parking lots (capacity of 615 cars) at West Beach typically fill several times during the summer. When the lots are full, the entrance gates to the beach are closed, and vehicles are only allowed in as other vehicles exit. During the summer of 1989 the West Beach lots filled on 11 occasions (down from 15 occasions in the summer of 1988). The accompanying graph illustrates the monthly distribution of use for the West Unit compared to the entire lakeshore. Note that visitation for the entire lakeshore also peaks in June, July, and August, although the peak is less pronounced than for the West Unit.

SOCIOECONOMIC ENVIRONMENT

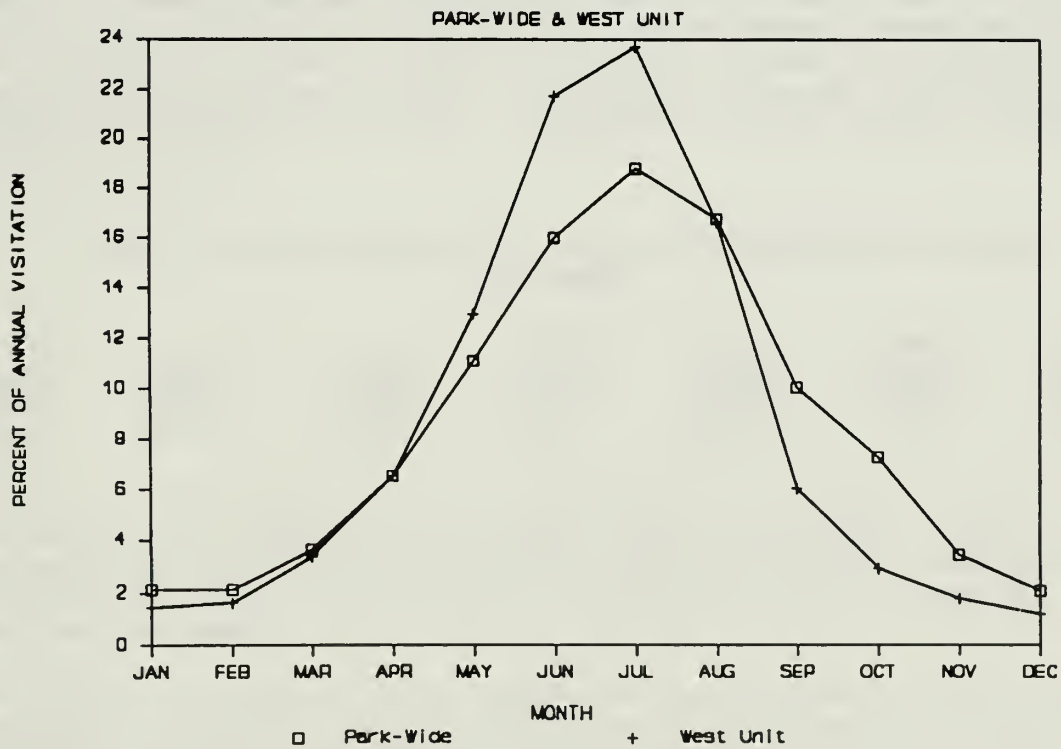
Economics/Population

The West Unit of Indiana Dunes National Lakeshore is located in the northwestern corner of Porter County and the northeastern corner of Lake County. The unit is within the corporate boundaries of the cities of Gary and Portage and surrounds the community of Ogden Dunes. The approximate boundaries of the unit are Lake Michigan on the north, National Steel on the east, and USX Corporation on the west. The southern boundary of the

ORIGIN OF VISITORS TO WEST BEACH



MONTHLY DISTRIBUTION OF USE



unit is irregular, but is generally paralleled by US 20 from the western boundary to County Line Road and the Little Calumet River from County Line Road to the eastern boundary.

The West Unit also largely encircles the community of Miller, a neighborhood within Gary. Miller is a predominantly middle-class residential community with some pockets of commercial development. The community is roughly defined by County Line Road on the east, Tennessee Street on the west, Lake Michigan on the north, and US 12 on the south.

Lake and Porter counties, like the rest of northwestern Indiana, have experienced substantial demographic and economic changes during the 1980s. A major contributing factor in these changes was an economic recession in the early 1980s that caused sweeping changes in the heavy industries that dominate the local economy. A decline in the automobile industry caused a parallel drop in the demand for steel and related products. This resulted in the loss of many jobs in the region. At the same time, many steel mills and factories began to streamline operations in order to remain economically viable. The installation of highly efficient automated production systems further reduced the need for manual labor in many plants. Thus, many individuals and families were forced to emigrate from the area in order to find work.

The loss in population in some parts of the counties has been partially offset by an immigration of persons who are seeking alternatives to the urban life-style of metropolitan Chicago. Many individuals who are employed in the Chicago area have moved to northwestern Indiana, but still commute to work in the city.

Table 1 illustrates the population dynamics of Lake and Porter counties for 1970-87; population projections for the year 2000 are also included. Referring to the table, it is possible to determine that the population of Lake County has declined by over 65,000 people (11.9 percent) between 1970 and 1987. Most of this loss is due to out-migration. During the same years, however, Porter County has experienced a substantial (41.3 percent) gain in population. This gain is primarily due to births-over-deaths, as net migration for the county has been negative since 1970. The recession of the early 1980s did affect the population dynamics of Porter County, as growth slowed from 37.5 percent (1970-1980) to 2.7 percent (1980-87).

**Table 1: Population Dynamics – Lake and Porter Counties, Indiana
1970-2000**

<u>County</u>	<u>1970</u>	<u>1980</u>	<u>Change 1970-80</u>	<u>Est. 1987</u>	<u>Change 1980-87</u>	<u>Proj. 2000</u>
Lake	546,253	522,965	-4.3%	481,200	-8.0%	473,863
Porter	87,114	119,816	37.5%	123,100	2.7%	133,710

The recent trends in population for northwestern Indiana are expected to continue through the year 2000. Lake County is projected to lose another 1.5 percent of residents between 1987 and 2000. Porter County's population is expected to grow by another 8.6 percent during the same period.

The populations of Lake and Porter counties have notably different racial compositions. Porter County is over 98 percent white (1980 census), and had virtually no change in racial composition between the 1970 and 1980 censuses. Lake County is about 71 percent white (1980 census), a decrease of nearly 8 percent from the 1970 census. About 24 percent of

Lake County's population is black, while another 4.5 percent is other minorities (primarily Asians, Pacific Islanders, and native Americans).

In 1985, the average per capita income was \$9,737 for Lake County and \$10,778 for Porter County. The statewide per capita income \$9,978 for 1985. In 1980, 9.2 percent of Lake County families and 3.8 percent of Porter County families were considered to have incomes below the poverty level.

The community of Miller had a 1980 population of about 14,290. The racial composition of Miller is relatively balanced, with about 53 percent blacks, 43 percent whites, and 4 percent distributed among all other minority peoples. Per capita income in Miller for 1980 was \$8,590. This total was 11 percent higher than the overall 1980 per capita income for Lake County and 1.5 percent higher than the 1980 per capita income for Porter County. Just over 10.5 percent of families in the community had incomes below the poverty level in 1980.

Despite the downturn in heavy industry during the early 1980s, manufacturing remains the mainstay of the local economy. Table 2 summarizes employment in the Gary-Hammond Primary Metropolitan Statistical Area (PMSA) for the year 1987. The Gary-Hammond PMSA consists of Lake and Porter counties. Over 25 percent of workers in the PMSA were employed in manufacturing jobs during 1987 (although the total number of workers in this sector was down about 48 percent from 1979). Another 21 percent of workers in the PMSA were employed in the service sector, while about 20 percent were employed in retail trade. The service sector has experienced the most growth over the past decade, with a 27 percent increase in the total number of jobs.

**Table 2: Nonagriculture Wage and Salary Employment
Gary-Hammond Primary Metropolitan Statistical Area - 1987**

<u>Sector</u>	<u>Employees</u>	<u>Percent of Labor Force</u>
Manufacturing	53,900	25.1
Nonmanufacturing	161,000	74.9
Construction	11,900	5.5
Transportation, Communications, and Utilities	13,700	6.4
Wholesale Trade	8,400	3.9
Retail Trade	42,900	20.0
Finance, Insurance, and Real Estate	8,200	3.8
Service	45,400	21.1
Government	30,500	14.2

The largest employers in the PMSA are Inland Steel and USX Corporation. Inland Steel employs around 14,800 individuals (down from 21,000 in the mid-70s) and USX employs about 7,500 (down from 26,000 in the mid-70s). Other major employers in the PMSA include Bethlehem Steel (6,400 employees), LTV Steel (4,600), National Steel (1,700), and Amoco Oil Company (1,600).

Data from the 1980 census indicates that about 26 percent of Miller residents are employed as operators, fabricators, or laborers. Another 24 percent work in technical, sales, and

administrative support occupations. Over 12 percent of employed Miller residents work in precision production, crafts, and repair.

Unemployment in the Gary-Hammond PMSA has declined substantially since the recession of the early 1980s. Current (July 1989) unemployment is 4.2 percent in Lake County and 2.2 percent in Porter County. Unemployment in these counties in 1983 was 15.8 percent and 14.2 percent, respectively. Current statewide unemployment in Indiana is 3.9 percent.

Regional Recreation Areas

The following is a partial list of recreation areas that can be found in the northwest Indiana area. Each description indicates whether it is a state, county, city, or private area.

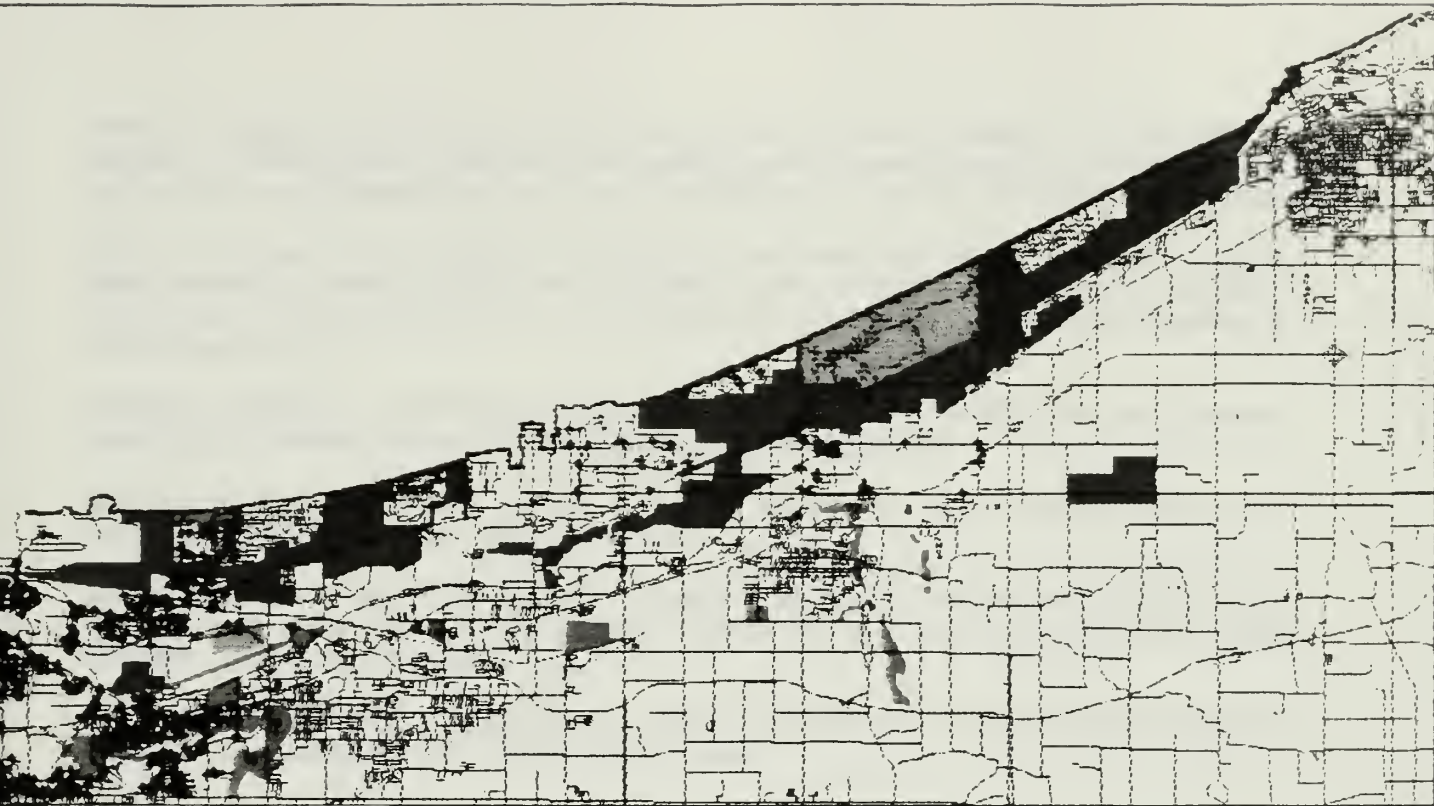
Indiana Dunes State Park (State). The 2,182-acre Indiana Dunes State Park lies between Lake Michigan and US 12, and is bounded by Kemil Road on the east and Dune Acres on the west. The eastern two-thirds of the park is a natural area allowing no development, fires, or organized activities. This area of the park contains Mt. Tom, the highest remaining Indiana dune (192 feet tall) and three of the largest blowouts in the park. The park provides a self-guiding nature trail and a nature center staffed by two park naturalists. There are 309 campsites, cross-country ski trails, and equipment rental. Six picnic shelters are available for rent, and a lifeguard is on duty at designated swimming areas.

Calumet Prairie (State). The Calumet Prairie, a state nature preserve of 140 acres, is generally bounded on the north by a pipeline right-of-way just south of I-90 and on the east by a north-south boundary, approximately 300 feet west of IN 51. The west branch of the Little Calumet River (Burns Ditch) is about 1/4 mile from the southern property boundary. The area contains a high quality example of a wet stand prairie, a type not currently included in the national lakeshore. The site is near the current national lakeshore boundary.

Marquette Park and Lake Street Beach (City of Gary). The 240-acre Marquette Park Beach area contains one concession stand. The bathhouse is currently closed and undergoing structural evaluation. Paved parking is available for approximately 660 cars, and paved beach parking provides approximately 380 more spaces. The park also contains a pavilion and parking for approximately 95 cars. The pavilion, rehabilitated in 1980, is used for social functions. Lake Street Beach has a boat ramp and parking space for approximately 480 cars. There is a concession stand with additional parking for about 240 cars.

Marquette Park is now used primarily by Gary residents, but it has the potential to be used by the same visitors who use West Beach. Over the years some facilities at Marquette Park have not been adequately maintained and have deteriorated. The bathhouse, beach wall, and parking areas are all in need of redesign and rehabilitation. Other facilities, like the pavilion, have been rehabilitated and are actively used. Among the problems that have inhibited the use of Marquette Park are the difficulty of access to the park and the general lack of maintenance of the facilities.

Jeorse Park (East Chicago). The 35-acre park has a beach on Lake Michigan. Facilities include a bathhouse adapted for use by handicapped individuals, a city-owned marina, public boat ramp, emergency overnight moorage, fishing pier, and picnicking.



Indiana Dunes National Lakeshore

State Park or Preserve

City Park

Other Designated Open Space

Abandoned Railroad Corridors

NOTE: These maps will be redrawn for the draft document with clear colors and symbols.

REGIONAL RECREATION FACILITIES

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Whihala Beach (Lake County). This 8-acre recreation park is located in Whiting and is adjacent to Whiting Park. Swimming and boating are the ever-popular activities here. The park contains a breakwater and boat ramp, bathhouse, and concessions. Parking is limited.

Deep River County Park (Lake County). Deep River meanders through the 906-acre park, which contains a restored grist mill. A sawmill, picnic shelter, and playground are being constructed. The park contains the only canoe livery on the Deep River, and canoeing is offered seasonally.

Portage Imagination Glen (City of Portage, Porter County). This 223-acre area contains some active recreation areas including picnic areas and ballfields.

Hawthorne Park (Town and County of Porter) Picnicking, trails, ballfields, fishing, and canoeing are available in this 35-acre park.

Washington Park (La Porte County). This 99-acre park is owned and maintained by Michigan City, and includes parking for approximately 600 cars, 3,000 feet of beach on Lake Michigan, marina access, and a zoo.

Wells Beach (Private). This privately owned and operated 2-acre beach includes a bathhouse, concessions, and parking for 100 cars.

RELATED PROJECTS

Proposed Gary Marina

The review period for the *Draft Environmental Impact Statement* (DEIS) closed on June 20, 1989. The DEIS is the joint responsibility of the city of Gary, Indiana, and the National Park Service. The proposed project is sponsored by the city of Gary. The DEIS identifies four alternative locations for the proposed marina and four access routes. The marina site preferred by both the city of Gary and the National Park Service is on previously disturbed lands behind the USX breakwater. The maximum development proposed is a 1,100-slip marina. The National Park Service's preferred access alternative is to use the route of the existing roadbed of the Indiana Harbor Belt (IHB) railroad to construct a two-lane access road. The city of Gary's preferred access alternative is either from Clay Street through NPS-owned lands to the common north-south corridor, or a route extending west from Lake Street along the national lakeshore foredune.

Little Calumet River Commissions

The Little Calumet River Basin Development Commission was created by state statute in 1980 to provide the nonfederal sponsorship and funding for federal flood control, recreation, and navigation improvements along the Little Calumet River in Lake and Porter counties. The Little Calumet River Basin Commission was created in 1971 to plan and coordinate efforts that would relieve the severe flooding along the Little Calumet River in Lake and Porter counties. These two commissions are implementing flood control improvements on the west branch of the Little Calumet River west of Broadway in Gary. The commissions' responsibilities include provision of recreation facilities. One long-term goal is a trail system along the west branch of the Little Calumet River.

The Little Calumet River Basin Development Commission designed and funded the breakwater improvements at the mouth of the Portage-Burns Waterway located on Lake

Michigan and included provisions for fishing from the breakwater. As part of the recreation component, they have acquired a 300-acre tract on the north bank of the west branch of the Little Calumet River in Gary, adjacent to Lake Station. They are also in the process of developing a 100-slip marina between the IN 249 spur and Portage-Burns Waterway just south of US 12.

Highway-Related Projects

FHWA/NPS County Line Road Bridge. This joint FHWA and NPS project will replace the existing IHB bridge on County Line Road and redesign the West Beach entrance and exit roads and their intersections with County Line Road.

IN 51 Widening between I-94 and US 20. This two-lane segment has been proposed to be widened to four lanes with turn lanes at each of the intersection. As part of this project, the intersection of Hobart Road and IN 51 would be relocated and redesigned to improve safety and traffic flow.

15th Street Extension in Lake Station. The city of Lake Station has proposed to extend 15th Street from the present intersection of 15th and Lake streets to IN 51 and Old Hobart Road between the northern boundary of the Calumet Prairie and the gas pipeline just south of I-94.

Hazardous Waste Lagoon Site

National Steel (Mid-West Division) owns a 60-acre parcel of land within the national lakeshore boundary adjacent to the west bank of the Portage-Burns Waterway and north of US 12. They have used this site for the disposal of hazardous waste materials from their steel coating and plating operations. Four pits (lagoons) were excavated and used for dumping of the waste material. Monitoring wells are in place at the lagoon sites. Currently the lagoons are being neutralized and reclaimed by excavation and filling, with a completion of filling and cleanup expected in the year 2005. The neutralized material from the lagoons is being hauled to an offsite artificial "dune" located on National Steel property just north of US 12. The four-lagoon site adjoins national lakeshore property on the west.

Upon cleanup of the hazardous waste site, the National Park Service has first right of refusal for purchase of this property. Assuming total cleanup and EPA clearance of this site, the federal government could purchase the site. The Park Service does have an interest in this site for future passive or active visitor uses.

Acquisition of the National Steel hazardous waste site parcel must follow Secretarial Order dated November 21, 1988, "Delegations and Functions With Regard to Land Acquisition (Hazardous Substances)" and comply with several federal and state environmental laws. The purpose of this secretarial order is to "ensure that each bureau charged with acquiring land determines, prior to acquisition, the likelihood of the presence and extent of hazardous substances on the land." Departmental policy indicates that it is imperative to determine whether hazardous substances are present on any real estate before such real estate is acquired by the United States.

Land acquisition must follow these procedures: (1) compliance with secretarial order on hazardous substances, (2) compliance with land acquisition requirements/restrictions – all hazardous waste must be totally removed and declared cleaned up by the EPA, and must have willing seller (National Steel) and negotiated price with interested buyer, and (3) must

complete a hazardous waste survey and inspection "to determine the possible presence of hazardous substances and the existence of or potential environmental harm therefrom by NPS prior to NPS acquiring property."

Potential acquisition of this hazardous waste lagoon site requires compliance with several environmental laws. The primary statute for hazardous waste regulations is the Resource Conservation and Recovery Act of 1976, as amended in 1984, and administered and enforced by the EPA.

Other environmental laws controlling hazardous substances related to this site and potential land acquisition are as follows:

- Clean Air Act (EPA)
- Clean Water Act (EPA)
- Safe Drinking Water Act (EPA)
- Occupational Safety and Health Act (U.S. Occupational Safety and Health Administration)
- Toxic Substances Control Act (EPA)
- Hazardous Materials Transportation Act (U.S. Department of Transportation)
- Comprehensive Environmental Response, Compensation, and Liability Act - Superfund (EPA)

The state hazardous waste agency is the Indiana State Board of Health, Division of Land Pollution Control, Indianapolis, Indiana.

Lake County Park Department

The Lake County Park system is made up of 10 park areas totaling more than 3,600 acres of open space. These parks include Whihala Beach and Deep River County Park. In addition to managing and developing existing county park areas, the Lake County Park Department is seeking to provide additional recreation opportunities by developing a hiking and biking trail network on abandoned railroad rights-of-way to link county park sites and other recreation areas. The abandoned Elgin, Joliet, and Eastern railroad right-of-way is being considered as a hiking and biking trail link among other abandoned railroad routes.

Lake Michigan Circle Tour

The Lake Michigan Circle Tour is a 1,100-mile motor-tour route that circles Lake Michigan. The tour is a cooperative initiative that is supported by the tourism industry and agencies in the four states that surround the lake. The route of the tour follows established trunk highways that are close to the lake. The tour is marked by signs with a distinctive logo that are posted every 10 miles along the route (or more often when necessary). The signs are intended to guide travelers from destination-to-destination along the route.

In northwestern Indiana, the Lake Michigan Circle Tour follows I-90 from the Illinois border to US 12, and then follows US 12 to the Michigan state line. The tour route traverses Indiana Dunes National Lakeshore along US 12. In addition to the primary tour route, local tourism groups have created a number of "spur" routes that connect the tour to additional points of interest. The spur routes in northwestern Indiana are as follows:

Lake County – I-65 south to US 30, US 41 south to Crown Point, and US 41 north to East Chicago

Porter County – IN 249 south to Central Avenue in Portage, IN 49 north to Dunes State Park, and IN 49 south to US 30
La Porte County – US 35 south to La Porte and Washington Boulevard south into Michigan City

East Unit Transit Center

The East Unit Transit Center was recommended as part of the 1980 *General Management Plan* for Indiana Dunes to provide shuttle bus services to visitors from a satellite location to the various lakeshore beaches. The proposed location of the East Unit Transit Center is an 85-acre site near the northeast corner of the intersection of Porter-La Porte County Line Road and US 12. The transit center would accommodate parking for 800 vehicles. An environmental assessment is currently in progress, with an anticipated completion in 1990. Construction funding is not expected within five to eight years.

East Unit Campground

An NPS-owned campground is currently being designed for a 182-acre site between US 12 and US 20, south of the Broadway and US 12 intersection. It is anticipated that it will accommodate 170 campsites, including a group camping area and provision for conventional, recreational, and walk-in sites. The first phase of the campground is expected to begin construction in the fall of 1990 and will consist of about 80 sites.

ALTERNATIVES

ALTERNATIVE 1

This alternative provides for direct, safe, separate access to the national lakeshore. It also provides for a highly visible, identifiable national lakeshore entrance. The major element of this alternative is the proposed access to West Beach by way of a new overpass and roadway along the abandoned IHB corridor. This access proposal is similar to the 1980 GMP recommended access route to West Beach. A detailed "Description of Alternative 1: Modified 1980 GMP – West Beach Access Road" is included as appendix B.

West Unit Access – 1980 GMP Recommendation

West Beach. This is basically the preferred alternative from the 1980 GMP and the preliminary design that was done in 1985. The new West Beach access road would be established by extending the roadway from the intersection of IN 51 and US 20, north with a bridge over an access road connecting the Zayre and K-Mart shopping centers, and a second bridge over the Baltimore and Ohio Railroad tracks and returning to grade (see Alternative 1: West Beach Access and General Development map). The route would then turn west following a sewer Interceptor easement to just south of the US 12 right-of-way where a third grade separation would begin. A new bridge would span US 12 and the railroad tracks used by the Chicago South Shore and South Bend Railroad and Conrail while curving around the west end of the Long Lake wetland. On the north side of the Long Lake wetland, the bridge would meet existing grade and continue east on the old IHB railroad alignment to West Beach. A spur road following the IHB to the west would connect with the Douglas Environmental Education Center parking lot east of Lake Street. During the summer, the present access to West Beach from County Line Road would be used for emergency vehicles only. During the off-season, direct access from County Line Road would be allowed and the new West Beach access road would be closed to traffic.

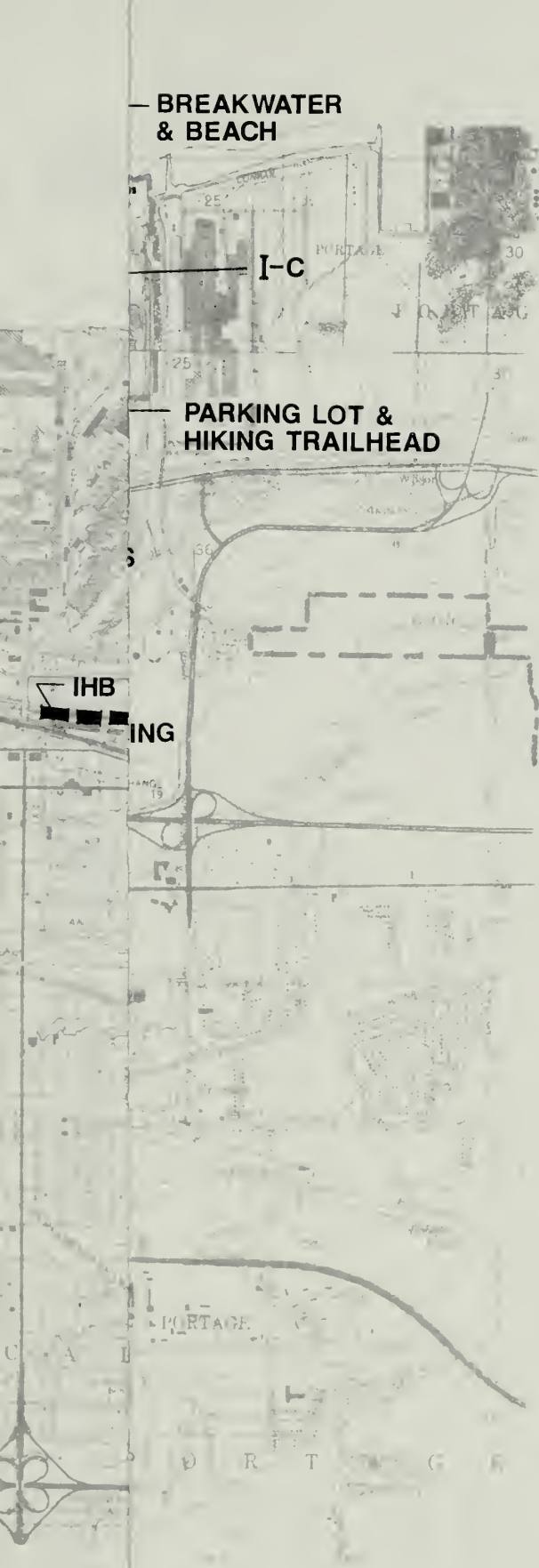
The segment of this route between the intersection with Montgomery Street and West Beach would be dedicated for visitor access to West Beach. A separate bicycle path and hiking trail would follow the general alignment of the new access road. During the summer high visitor use season, only local commercial and residential traffic would use County Line Road.









Marquette Park. Access to Marquette Park would be provided by way of Montgomery Street. Montgomery Street would be connected to the West Beach access route by a 1,000-foot road segment. Montgomery Street widening and pavement improvements would be required.

Proposed Gary Marina. Access to the proposed marina on USX property would be from the currently active IHB right-of-way near the Intersection of US 12 and I-65 or by way of USX-owned lands.

Transit Center and Shuttle Bus System – 1980 GMP Recommendation

The West Unit transit center would be located in the Tolleston Dunes, northeast of the access road bridge over the Baltimore & Ohio Railroad tracks. The facility would include parking for 800 vehicles, a transit center building, and a boarding area for the West Unit shuttle system. The capacity of the existing West Beach parking area would be reduced by 50 percent to 300 cars, and would accommodate off-season use when the shuttle bus



-  PARK BOUNDARY
-  WEST BEACH ACCESS ROUTE
-  DOUGLAS CENTER ACCESS ROUTE
-  MARQUETTE PARK ACCESS ROUTE
-  MARINA ACCESS ROUTES
-  HIKING TRAIL
-  HIKE / BIKE TRAIL
-  ROAD WITH HIKE / BIKE TRAIL

ALTERNATIVE 1

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626 • DEC • 20, 078 A • FEB 90



226 • DSC • 2A078A • FEB 90

system was not operating. When the existing West Beach parking area is full, visitors would be required to park their cars at the transit center and take the shuttle to West Beach. The existing West Beach parking area would continue to operate until the transit center and parking area were operating.

General Development

The following discussion addresses trail development, visitor facilities, and vehicular access (see Alternative 1: West Beach Access and General Development map).

The West Unit is composed of several subunits such as the Gary pedestrian corridor, Miller Woods, Inland Marsh, and West Beach, which would be linked by hiking and biking trails. The trail improvements are consistent with the long-term goal of the national lakeshore – to tie it together by one trail system. Using the IHB railroad right-of-way as a primary route, a hike/bike trail would be extended eastward from Broadway in Gary to the east side of West Beach. At that point the trail would turn south along the east boundary at West Beach and then east along the north side of US 12 to Hillcrest Road at Ogden Dunes. At this intersection the trail would cross US 12 and extend west to Inland Marsh along a new access road to the Inland Marsh parking lot. The existing Inland Marsh parking lot access from US 12 would be obliterated. The trail would also extend to the east along US 12 to connect with trail proposals in the *Little Calumet River Corridor Study* and *US 12 Scenic Road Feasibility Study*.

In the Gary pedestrian corridor at the west end of the national lakeshore, hiking trails would extend from the IHB trail route through the oak savannah areas both west and east of the Douglas Center. At Miller Woods, between USX property and Lake Street, a system of hiking trails would extend from the IHB route through the wooded dunes to Lake Michigan, as proposed in the 1984 *Trail Plan*. The warming hut proposed in the 1984 plan would not be constructed.

Hiking trails would be constructed in the Edgewater area, in the northwest corner of the West Beach unit. These trails would connect to existing trails within the West Unit, the parking lot, picnic area, Long Lake/wetland interpretive areas, information center, and beach house, to the wooded dune areas at the west edge of the unit, and to Lake Michigan. The 14,200 feet of trails would add interpretive opportunities and scenic overlooks, as well as providing an alternative trail route to Lake Michigan. The trails would wind through the undeveloped areas in Edgewater, passing over high points with expansive views, around wetlands, avoiding existing residential and disturbed areas, and connecting to the Lake Michigan shoreline.

For Unit I-C, located north of US 12 between Ogden Dunes and the Portage/Burns Waterway, a road would be extended from Hillcrest Road at Ogden Dunes east and north on NPS property to the eastern boundary of the national lakeshore (about 1/2 mile). Here a 20-car parking area would be constructed to serve as the trailhead for the 1/2 mile long hiking trail through the woods and dunes to the beach. This trail would provide access to both the beach and the Portage-Burns Waterway breakwater. Trails would be developed on the west half of this parcel, which is still in its natural state and owned by the National Park Service. The eastern half of this parcel, owned by National Steel, is being reclaimed after years of use as the site for four hazardous waste lagoons. The National Park Service cannot acquire the eastern half unless National Steel is willing to sell and until it can be demonstrated that no hazardous wastes remain and there are no hazards to visitors from its previous use (see hazardous waste discussion in "Related Projects" section). If the National Park Service acquires the site, the access road from Ogden Dunes would be

extended east from the previously mentioned trailhead parking lot to the access road that parallels the waterway, and then follow that road north to Lake Michigan, the beach, and the breakwater. A 20-car parking lot would be developed at this northern terminus of the access road, and the parking area near Hillcrest would be removed.

Accessibility

All hiking and biking trails would be designed for access by special need populations, such as the elderly and handicapped. The bicycle paths would be surfaced to facilitate wheelchair access. Hiking trails through the dunes might not be accessible to wheelchair users, but these trails could be accessible to visually impaired visitors. All development at the park would comply with all appropriate laws and regulations, including the Architectural Barriers Act of 1968 (42 USC 415 et seq.) and the Rehabilitation Act of 1973 (29 USC 792 et seq.).

Management Zoning

Management zoning establishes the future emphasis for the park's lands and waters, showing where different kinds of management strategies would be implemented. Management zoning for the West Unit is basically the same as in the 1980 GMP except that the lands that were not within the boundary in 1980 (the lands known as the Gary pedestrian corridor) have been added to the natural environment subzone. The active railroad corridors through this area will be part of the special use, transportation, subzone. A second modification of the 1980 Management Zoning map is that a small recreational development subzone has been added to permit the 20-car parking lot just east of Hillcrest Road and US 12. The third modification of the 1980 Management Zoning map is that the recreational development subzone in the Miller Woods that had been the proposed location of a winter warming hut has been changed to the natural, outstanding natural feature, subzone, since the warming hut is no longer part of proposed development plans. Management zoning for proposed boundary adjustments will be determined when and if the park boundary is modified.

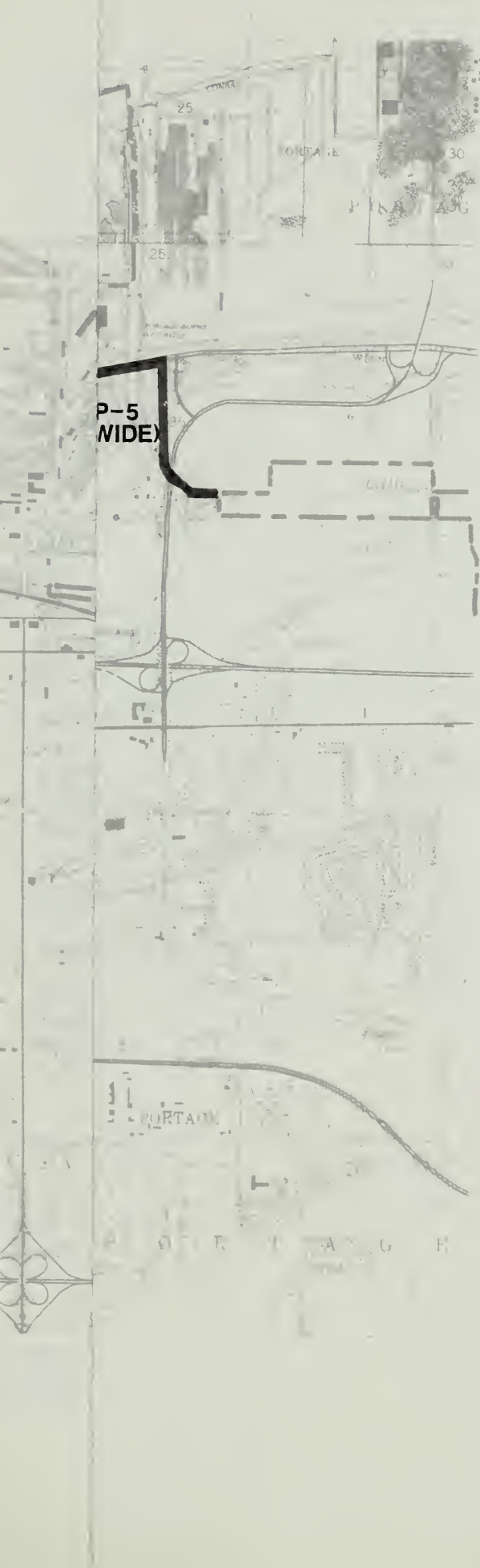
Boundary Adjustments

The following boundary adjustments are recommended to provide for the protection of natural resource values and visitor use facilities (see Boundary Adjustments map for location of the individual sites).

DCP-5 – This 100-foot-wide corridor along US 12 connects the park boundary south of US 12, continues east along US 12, south on Crisman Road, and east along the Little Calumet to the national lakeshore's western boundary on Little Calumet. The approximately 10-acre parcel would allow for a hike/bike trail linking the East and West units.

LC-1 - This 200-acre Inland Woods addition is located south of Conrail and north of Baltimore & Ohio Railroad tracks between the national lakeshore boundaries. The area contains one of the high quality savannas and mostly untouched oak dune savanna and wetlands. This area would be managed to preserve its natural resources

LC-2 - The approximately 45-acre Tolleston Dunes addition is located between US 20 and the Baltimore & Ohio Railroad tracks, just west of the Lake/Porter county line. This is the last high dune on the north side of US 20. This area also includes a highway



PARK BOUNDARY



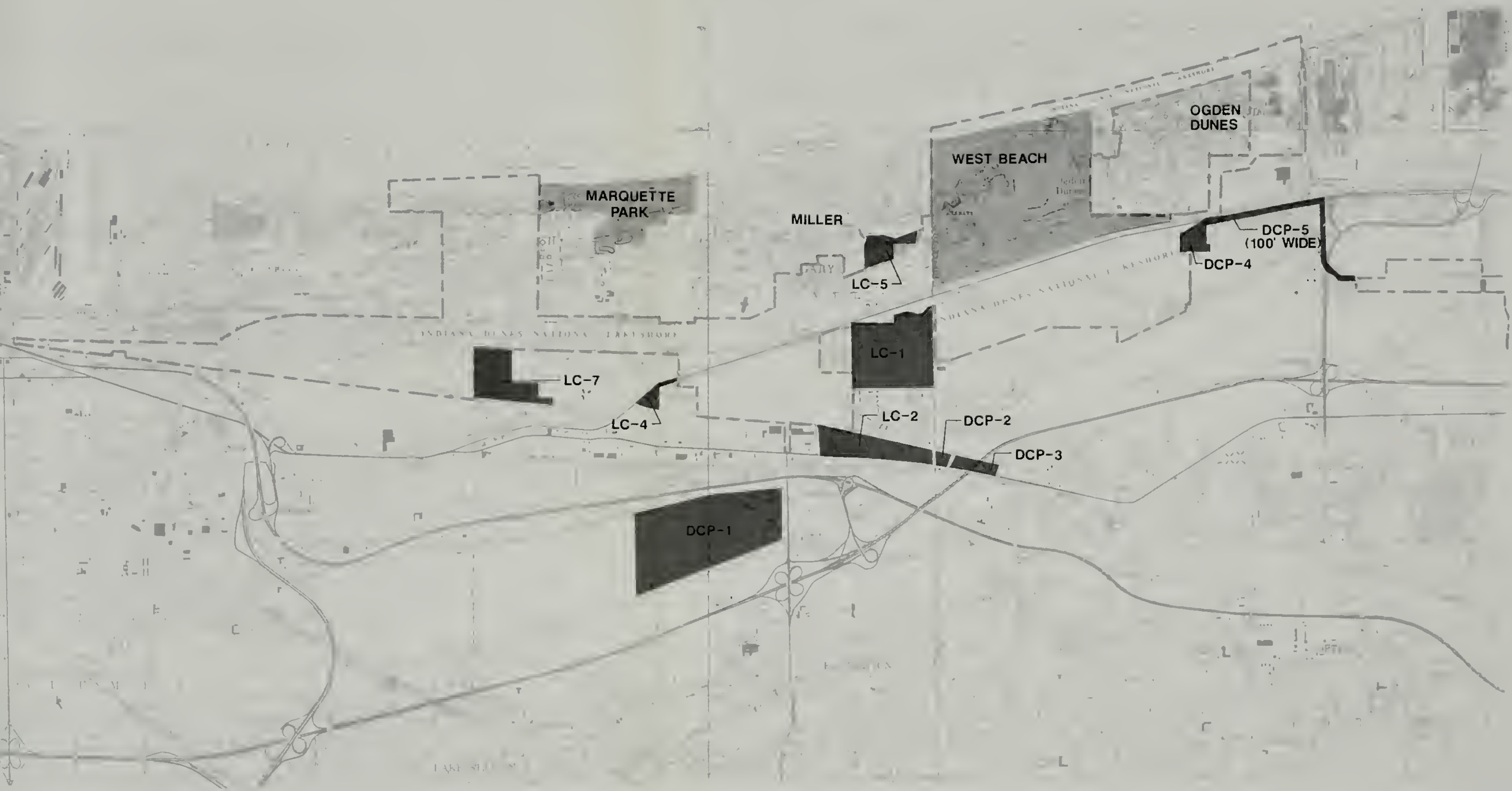
BOUNDARY ADJUSTMENTS

BOUNDARY ADJUSTMENTS

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626 • DSC • 20,080 • NOV. 89



- PARK BOUNDARY
- BOUNDARY ADJUSTMENTS

BOUNDARY ADJUSTMENTS

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626 • DEC • 20,080 • NOV. 89

commercial site currently used for exotic dancing. The natural resources of this parcel would be protected, and the disturbed portions of the site are an alternative site for a future West Unit transit center and/or remote parking area.

LC-4 - The Dunes Highway Corridor addition extends the park boundary westward along the south side of US 12 to Hobart Road. Acquisition of this approximately 5-acre site would allow for the removal of the two truck terminals on the site. The site is an alternative location for the West Unit transit center and remote parking. In the interim the parcel would be landscaped with mature vegetation to improve its appearance. In addition, this site could be used for parking and as a trailhead for the Tolleston Dunes east-west trail. Acquisition would also allow for improving the access to Marquette Park from US 12 via Hobart Road and Grand Boulevard.

LC-5 - The 22-acre Pottawattomie Woods addition is a dune area north of Long Lake wetland and IHB right-of-way and west of County Line Road. This parcel would allow for a vegetation buffer between the West Beach access road ramps and the adjacent residential community.

LC-7 - This 60-acre addition lies east of Clay Street in the southeast portion of the Miller Woods. This area extends the Miller Woods ecosystem containing high quality savanna and marsh areas. It would be managed to preserve its natural resources.

DCP-1 – Located north of the Little Calumet River along US 51, to US 80/90 and includes the Calumet Prairie, this 140-acre area would be managed to preserve its natural resources.

DCP-2 – This approximately 2-acre parcel is bounded on the west by the Lake/Porter County Line Road on the east by the west branch of the Little Calumet River, on the north by the Baltimore & Ohio Railroad tracks, and on the south by US 20. This parcel could be used for public access to the west branch of the Little Calumet River as well as to the proposed hiking and biking trail.

DCP-3 – Bounded on the west by the Little Calumet River and ending west of the Burns Ditch/US 20 rest area, on the north by the Baltimore & Ohio Railroad tracks, and on the south by US 20, this approximately 14-acre site could be used to provide access to a proposed hiking and biking trail.

DCP-4 – Located south of US 12 across from Ogden Dunes and between Old Stagecoach Road and Inland Marsh, DCP-4 connects with DCP-5. This approximately 10-acre site would be used for a portion of a trail connecting the East and West units and would also provide for a safer entrance to the Inland Marsh.

Visitor Use Management

Carrying capacity, as applied to recreation lands, is a concept intended to help estimate the level of visitor use that an area can support. The goal of the concept is to identify a level of use that will prevent resources from suffering degradation due to overuse and that will preserve the quality of visitor experiences.

There are four types of carrying capacity that can be applied to recreational settings – physical, ecological, social, and facility (Shelby and Heberlein 1986). Any one or any combination of these capacities may be applied to a recreation area at a given time. Selection of a capacity measurement framework for an area is dependent on management

policies and objectives, on specific conditions within the park, and on the availability or accessibility of baseline data. In addition, different measurements of capacity may be applied to separate areas within a facility.

The 1980 *General Management Plan* for Indiana Dunes identified the annual carrying capacity of the West Unit as 605,000 individuals. This capacity is based on the number of recreationists that can participate in a variety of activities within the unit. This physical capacity was determined by using a methodology developed by the Urban Research Development Corporation (1977).

The average use of West Beach from 1985 to 1988 was about 344,000. The peak use of West Beach for that period was 366,600 in 1985. Thus, recent use of West Beach is well within the established carrying capacity of the unit.

A 1986 *Visitor Impact and Mitigation Study* (Hultsman 1986) was completed for the West Beach of Indiana Dunes National Lakeshore. It specifically evaluated management implications and relative visitor reactions and behavior to mitigative measures. Research recommendations from this study included the following:

- Determine if a capacity limit exists for the beach.

- Determine visitor use after the no alcohol policy is implemented.

- Monitor boardwalk use.

- Continue future visitor use surveys.

- Continue maintaining the existing boardwalks and add boardwalk development while providing interpretive, educational, and informational signing and protective fencing (enclosures).

During the mid-1980s, the national lakeshore's research division conducted an in-house visitor/vegetation impact photo monitoring program at West Beach. While no specific conclusions or reports resulted, the lakeshore will continue to conduct and monitor a resources impact program with available funding.

To ensure that use of the West Unit remains within acceptable levels and to ensure that visitor experiences are of the highest possible quality, a formal visitor management program should be established for the unit. The purpose of the program would be to help avoid undesirable changes in the resource base or in the visitor experience that occur as a result of visitor use. If undesirable changes do occur, management strategies would be implemented to keep impacts within acceptable levels. The program would also allow for the evaluation of the effectiveness of any management actions that might be implemented to respond to undesirable changes.

The design of the program would be similar to other visitor use management frameworks that are currently being used in recreation areas across the country. Examples of existing management methodologies include *The Limits of Acceptable Change (LAC) System for Wilderness Planning* (Stankey et al. 1985), "Recreation Impacts and Carrying Capacity: A Visitor Impact Management Framework" (Graefe et al. 1987), and "A 'Quality' Rationale and Process for Recreational Capacity Determination." (Chilman et al. 1988).

The program would not attempt to set numeric capacities to limit visitor use, but would define specific desired conditions to be maintained. The program would allow for phased

implementation of corrective management actions only after Impact standards have been exceeded and an actual problem verified.

To implement the program, the park staff would need to establish a systematic monitoring network within the unit. The initial purpose of the network would be to establish baseline resource conditions. Once baseline conditions are established, the network would serve to measure the effects of visitor use on the ecosystem, social conditions, recreational activity patterns, and park facilities.

In addition to resource monitoring, the park should also conduct a visitor survey to determine use patterns (including turnover rates, average length of stay, and intrapark travel patterns). The survey should be designed to allow easy longitudinal follow-ups as may become necessary or appropriate.

When baseline data have been established, the desired conditions that should be maintained in the West Unit would be identified. These desired conditions, which would be expressed in terms of "impact indicators," would be the standards against which impacts are assessed. Examples of potential impact indicators include the health of dune plant communities, the number of social (or undesignated) trails through fragile areas, and the perception of crowding along the beach.

If subsequent monitoring indicated that any Impact Indicator standard was being exceeded, management would then initiate a sequence of steps to determine if conditions had become unacceptable. The initial management response to a possible violation of standard would be a reassessment of the standard to determine if it was reasonable and appropriate. If the standard was affirmed, management would then investigate the conditions associated with the indicator to verify that an unacceptable situation actually existed. If an unacceptable situation was found, management would analyze the cause of the violation. Following such an analysis, managers would determine the most appropriate action to be taken to correct the situation.

The potential management alternatives that could alleviate an undesirable condition would vary widely from situation to situation. Further, a broad range of alternatives could also be implemented to mitigate any one situation. If monitoring and subsequent analysis determined that a management action was needed to correct an undesirable condition, managers would select the corrective technique that was least intrusive on the visitor experience. If that technique were to be ineffective, management would then progress to the next-least intrusive technique. This progression would continue until the undesirable condition had been corrected.

Interpretation

Interpretive themes for the West Unit would remain as described in the "Description of the Environment" section under the discussion on Interpretive themes, facilities, and programs. The West Unit transit center would have information exhibits about the entire lakeshore. The information would include what there is to see and do in other units of the park and how to get there. Interpretive exhibits would provide an introduction to dune and wetland ecology as seen in Tolleston Dunes, Long Lake wetland, and West Beach. Interpretation would be available on the shuttle bus either in narrative form by the driver or a recording or as a publication. The focus of interpretation would be to help visitors understand what they are seeing on their way to the beach.

ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

This alternative uses existing routes while minimizing the impact on undisturbed areas and uses existing parallel lake routes with perpendicular access to Lake Michigan. A new bridge would be constructed on County Line Road over US 12 and the Conrail and South Shore Railroad tracks. An Interim recommendation is to improve US 12 and County Line Road intersection and at-grade railroad crossing by adding left- and right-hand turn lanes as well as railroad and traffic-activated signals.

West Unit Access – Improve Existing Routes

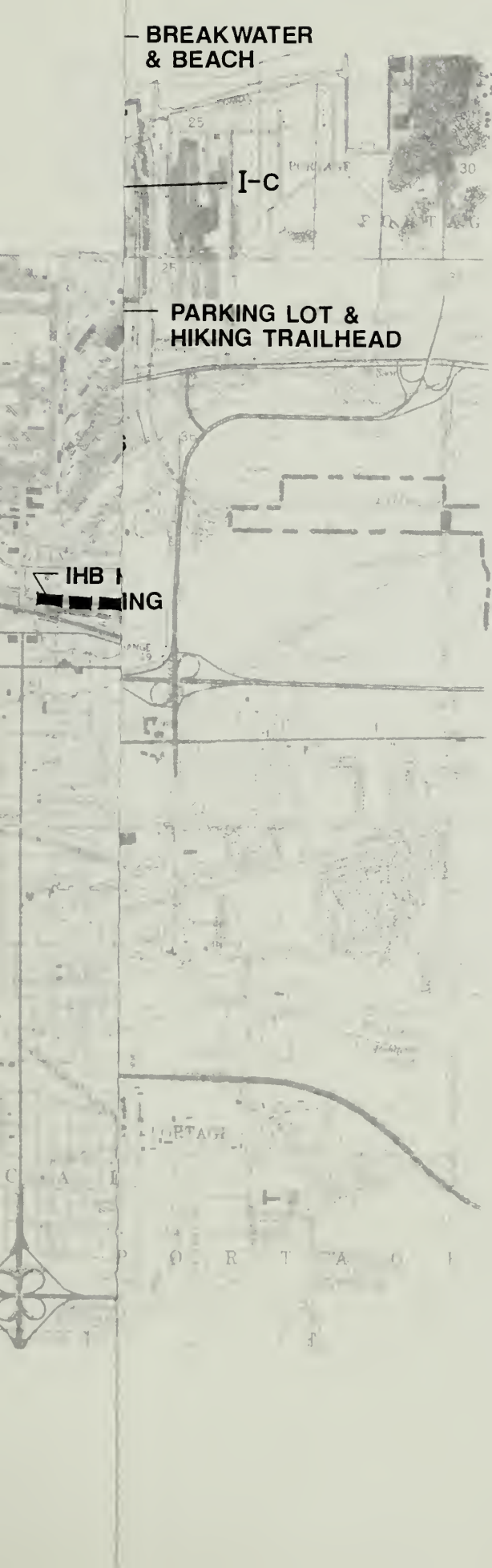
West Beach. This alternative would use the two current routes that are used by visitors to West Beach – from I-94 to IN 51, US 20, and County Line Road; and from I-90 (the toll road) to I-65, US 12 and 20, to US 12, and County Line Road (see Alternative 2: West Beach Access and General Development map). These routes would be improved by adding signs directing visitors to West Beach and improving selected intersections that have traffic engineering and operational problems. Some of these intersections also have high accident levels and safety hazards. Intersections would be improved by adding dedicated left- and right-turn lanes and modifying traffic signal operation (see diagram in appendix C of recommended interim improvements).

A new bridge would be constructed on County Line Road over US 12 and the Chicago South Shore and South Bend and Conrail Railroad tracks to eliminate the traffic and safety hazards of this intersection as well as the at-grade railroad crossing. Ramps in the southwest quadrant of the interchange would allow for access from US 12 to County Line Road. Retaining walls would be used to contain the fill for the bridge approaches, minimizing the impact on wetlands. In addition, flow structures and culverts would be incorporated in the design to allow for water flow between Long Lake and the Long Lake wetland. This new overpass would be compatible with the IHB bridge reconstruction and West Beach access road project that is currently being designed and scheduled for construction in mid-1990. (See diagrams of recommended overpass improvements in appendix C.)

Marquette Park. Road improvements would be made to Hobart Road to facilitate access to Grand Boulevard and Marquette Park. This would include the following: improvements to the IN 51 and US 20 Intersection, widening and shoulder improvements on Hobart Road, improvement of Hobart Road and Baitmore & Ohio Railroad crossing, and replacement of IHB bridge on Grand Boulevard with a pedestrian structure that would eliminate bridge piers on Grand Boulevard. The current IHB bridge over Grand Boulevard is being removed by the National Park Service in the spring of 1990, resulting in the elimination of two pairs of posts on Grand Boulevard that are a traffic hazard.

Proposed Gary Marina. Access to the proposed marina on USX property would be from the currently active IHB right-of-way near the intersection of US 12 and I-65 or by way of USX-owned lands.

Traffic Options When West Beach Parking Is Full. Special signs could be used just south of County Line Road and US 12 and on the east approach to County Line Road on US 12 to alert visitors that West Beach is full. Visitors could then be directed to East Unit beaches if room was available or west on US 12 to Marquette Park via an improved intersection at US 12 and Hobart Road to Hobart Road and Grand Boulevard.



- PARK BOUNDARY
- WEST BEACH ACCESS ROUTE
- ■ ■ MARQUETTE PARK ACCESS ROUTES
- ● ● MARINA ACCESS ROUTES
○ ○ ○
- HIKING TRAIL
- HIKE / BIKE TRAIL
- ||||| ROAD WITH HIKE / BIKE TRAIL

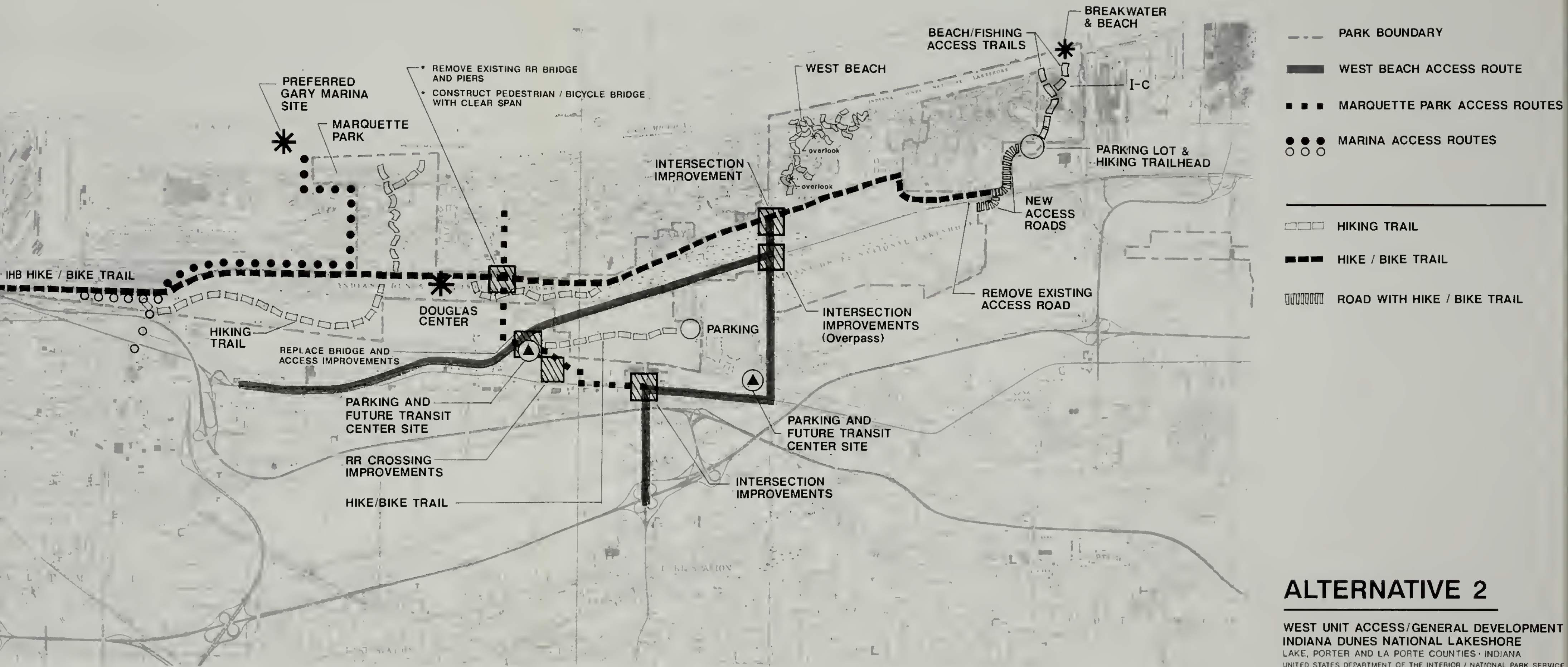
ALTERNATIVE 2

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ALTERNATIVE 2

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6/26 • DEC • 22/019A • FEB 90

Special signs could also be used on IN 51 just south of the intersection of IN 51 and US 20 to direct visitors to Marquette Park via Hobart Road when West Beach was full. Road improvements would be required on Hobart Road as described above. A beach parking sign at this location would direct all beach traffic to the IN 51 and US 20 intersection where vehicles would normally go right (east) to West Beach, and when West Beach was full, all beach traffic would turn left (west).

In order to notify beach users who have exited the toll road at I-65 and US 12 and 20, a sign would be placed on US 12 just west of the new access ramp from US 12 to Hobart Road that would be activated when West Beach was full. It would direct West Beach bound traffic to exit onto Hobart Road, turn left on Hobart Road to Grand Boulevard, and proceed on to Marquette Park. Until the truck terminal site is acquired, this sign would be located just west of Lake Street to direct traffic north on Lake Street, then right on Miller Avenue, and north on Grand Boulevard to Marquette Park.

Transit Center and Shuttle Bus System

Development of the West Unit transit center and shuttle bus system would be deferred until there is more demand and the system feasibility is proven for operation in the West Unit. Some of the factors that make the transit center and shuttle bus system infeasible at this time are (1) the convenience and desire of West Beach users to use private automobiles, (2) capacity of the existing West Beach parking lot, which is full 10-25 days per year, and (3) no private sector response to the 1988 request for proposal to operate the shuttle bus system, indicating that the shuttle bus system is not economically feasible at this time.

As economic and sociological conditions change, it may become feasible to operate a shuttle bus system to West Beach. In this alternative, future transit center locations would be either between the Zayre parking area and Old Stagecoach Road on US 20 or at the truck terminal site near the US 12 and Hobart Road overpass. Conditions that would justify the acquisition and construction of a West Unit shuttle bus system are (1) a significant, sustained increase in the price of gasoline, (2) natural resource management needs to reclaim the existing West Beach parking area, (3) destruction of the West Beach parking area, and (4) other economic factors that indicate changing conditions that would make a shuttle bus system feasible.

When some combination of the above factors determines that the Shuttle Bus system should be implemented, a trial shuttle bus system would be developed with a minimum investment of public funds. When the trial shuttle bus system is shown to be successful, the West Unit transit center and parking lot should be built.

General Development

General development under alternative 2 would be identical to that described in alternative 1, except that there would be a trail developed in the Tolleston Dunes with an eastern parking area trailhead at the southwest corner of parcel LC-1. This trail would connect the transit center site (Hobart Road and US 12), parcel LC-4, to the Inland Woods addition, parcel LC-1, through the Tolleston Dunes (see Alternative 2: West Beach Access and General Development map). The transit center and its parking lot would be the western trailhead. A new parking lot for 15-20 cars would be constructed adjacent to the southwest corner of the LC-1 parcel to serve as the eastern trailhead.

The existing parking area modules at West Beach were designed to hold 615 cars and 25 buses. These numbers are based on the use of 10-foot by 20-foot, 60-degree angle parking stalls for cars. Parking would be increased by restriping the two existing parking lots using smaller-sized, 9-foot by 20-foot stalls. The 9-foot by 20-foot spaces would be more efficiently configured at 90-degrees to the traffic aisles. This 90-degree layout dictates a minimum aisle width of 24 feet. These modifications plus some minor reconfiguration of the parking rows could increase parking capacity to 700 cars.

The existing abandoned IHB bridge over Grand Boulevard would be replaced with a clear, single-span structure for the hiking and biking trail. This new structure would result in the elimination of two pairs of posts on Grand Boulevard that are a traffic hazard.

Accessibility

Under this alternative, access for special need populations, such as the elderly and handicapped, would be the same as described in alternative 1.

Management Zoning

Alternative 2 management zoning would be the same as described in alternative 1 except that the park development, access/circulation subzone from IN 51 and US 20 to the entrance of West Beach at County Line Road and the West Unit transit terminal would remain in the natural zone.

Boundary Adjustments

Boundary adjustments in this alternative would be the same as described in alternative 1.

Visitor Use Management

The visitor management program for the West Unit discussed in alternative 1 would also apply to this alternative. Refer to alternative 1 for the full description.

Interpretation

Interpretive themes would remain as described in the "Description of the Environment" section under the discussion on interpretive themes, facilities, and programs. No new proposals for interpretation would be made until such time as the West Unit transit center and shuttle system were developed. The transit center would have information exhibits about the entire national lakeshore. Information would include what there is to see and do in other units of the park and how to get there. Interpretive exhibits would provide an introduction to dune and wetland ecology. Until the transit center was constructed, these topics would be interpreted by existing facilities at West Beach.

ALTERNATIVE 3 (NO ACTION)

The no-action alternative represents projected uses and actions in the West Unit that would occur without the adoption of the GMP amendment and West Unit DCP. There would be

DEVELOPMENT COST ESTIMATES

ALTERNATIVE 1

Remove parking at West Beach		
Pavement demolition	22,200 SY	\$ 287,000
Regrade and replant disturbed area	22,200 SY	108,000
Construct West Beach access road along IHB from		
IN 51 and US 20 to West Beach	LS	18,287,000
Construct spur road to Douglas Center -		
roadway (4,500 ft by 22 ft)	11,000 SY	443,000
Construct road connection to Montgomery St. -		
roadway (500 ft by 28 ft)	1,200 SY	48,000
Construct West Unit transit center ¹	3,000 SF	580,000
800-car parking lot, asphalt	LS	1,546,000
Construct trails		
Gary pedestrian corridor		
Hiking (19,500 ft by 8 ft), gravel	17,300 SY	419,000
Hike/bike (Broadway to Ogden Dunes -		
42,000 ft by 10 ft), asphalt	46,700 SY	1,504,000
Miller Woods		
Hiking (6,000 ft by 8 ft)	5,300 SY	103,000
Unit I-C		
Hiking (5,500 ft by 8 ft)	4,900 SY	95,000
Roadway (3,000 ft by 18 ft)	2,700 SY	109,000
Parking lot (20 cars)	750 SY	48,000
Access road extension (2,000 ft by 18 ft) ¹	4,000 SY	116,000
Existing access road improvements ²		
(3,000 ft by 18 ft)	6,000 SY	243,000
West Beach trails at Edgewater area ³		
Hiking (14,200 ft by 8 ft)	12,600 SY	243,000
Parcel DCP-4		
Obliterate existing parking access drive		
at Inland Marsh/US 12 (20 ft by 200 ft)	450 SY	6,000
Construct new parking access road to		
Inland Marsh (20 ft by 1,000 ft)	2,300 SY	93,000
Construct new pedestrian clear-span bridge over		
Grand Boulevard at IHB right-of-way	150 LF	<u>126,000</u>
Total		\$24,404,000

ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Intersection improvements at County Line		
Road and US 12		
Construct new road bridge over County Line		
Road at US 12	LS	\$1,417,000
Hobart Road improvements		
Add access ramps at US 12	LS	322,000
Widen Hobart Road and provide shoulders;		
improve B&O RR crossing of Hobart Road	LS	403,000
Improve IN 51/US 20 intersection	LS	121,000
Install 3 lighted direction signs to divert traffic		
to alternate beaches	LS	164,000
Restripe West Beach parking		
Obliterate existing stripes (615 spaces)	4,100 SF	6,000
Paint new stripes (700 spaces)	4,600 SF	8,000

ALTERNATIVE 2 (cont.)

Tolleston Dunes		
Hiking trail (6,000 ft by 8 ft)	5,300 SY	103,000
Parking lot (20 cars)	750 SY	48,000
Construct West Unit transit center ¹	3,000 SF	580,000
800-car parking lot, asphalt	LS	1,546,000
Construct trails		
Gary pedestrian corridor		
Hiking (19,500 ft by 8 ft), gravel	17,300 SY	419,000
Hike/bike (Broadway to Ogden Dunes - 42,000 ft by 10 ft), asphalt	46,700 SY	1,504,000
Miller Woods		
Hiking (6,000 ft by 8 ft)	5,300 SY	103,000
Unit I-C		
Hiking (5,500 ft by 8 ft)	4,900 SY	95,000
Roadway (3,000 ft by 18 ft)	2,700 SY	109,000
Parking lot (20 cars)	750 SY	48,000
Access road extension (2,000 ft by 18 ft) ¹	4,000 SY	116,000
Existing access road improvements ² (3,000 ft by 18 ft)	6,000 SY	243,000
West Beach trails at Edgewater area ³		
Hiking (14,200 ft by 8 ft)	12,600 SY	243,000
Parcel DCP-4		
Obliterate existing parking access drive at Inland Marsh/US 12 (20 ft by 200 ft)	450 SY	6,000
Construct new parking access road to Inland Marsh (20 ft by 1,000 ft)	2,300 SY	93,000
Construct new pedestrian clear-span bridge over Grand Boulevard at IHB right-of-way	150 LF	126,000
Total		\$7,823,000
Interim Intersection Improvements at County Line Road and US 12		
	LS	\$ 45,000

SF = Square Feet

SY = Square Yards

LS = Lump Sum

NOTE: Costs presented are gross figures, which include advance planning, project planning, construction supervision, and facilitating administrative services. Estimates are class "C" meaning they are derived from average costs for similar facilities in other NPS areas.

¹ Development accomplished only when conditions warrant transit center.

² Development accomplished only when site has been totally cleaned of all hazardous waste and completely reclaimed.

³ Development accomplished only after the Edgewater area becomes part of the lakeshore.

⁴ The design for this item will not be done by the National Park Service. The percentage cost increase for this item is therefore less than that for all other items in this estimate, and includes advance planning, construction supervision, and facilitating administrative services. Project planning activities have been dropped.

ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1

Impacts on Natural Resources

Topography. Under this alternative, the general topography within the West Unit would not be affected. However, construction of the GMP proposed bridge/IHB road access to West Beach would cause significant impacts and result in modification of the topography in the Tolleston Dunes area. Grading and landscape shaping for access road and bridge construction would permanently disturb about 1.5 acres of backdune landscape. There would also be topographic modification impacts on the IHB road access segment. Among these impacts are widening of the fill area for the road. Minor impacts of reshaping the topography would occur with the added 500-foot road connection alignment from the bridge to Montgomery Street for access to Marquette Park.

Development actions for the West Unit transit center in the Tolleston Dunes site would have a significant ground disturbance and grading and landscape contouring effect on about 11.5 acres of backdune area.

The access road segment that extends from the Conrail tracks to the IHB corridor would require excavation along about 800 feet at the base of a dune ridge, where an existing vehicle track would be widened. Improvements of the IHB corridor would require excavation or filling low areas for about 0.75 mile where the railroad right-of-way is narrow. Other portions of the access road, transit center, and parking area would be located on abandoned railroad corridors, sand-mined areas, sewer rights-of-way and other sites where excavation of dunes would not be necessary.

Soils/Vegetation. Under this alternative, there would be significant impacts on the soils. Construction of the bridge segment through Tolleston Dunes and on the IHB corridor would result in permanent disturbance, displacement, and compaction of 3.3 acres of undisturbed backdune soils in the Tolleston Dunes resulting from impermeable permanent surfaces. Permanent reduction of water infiltration into the soil would result along the IHB road segments, which total about 1.8 acres of existing disturbed soils.

Permanent disturbance, displacement, and compaction would result on 0.1 acre of upland forest soils for the 500-foot road connection to Montgomery Street. Also, permanent reduction of water infiltration into the soil would result underneath this road segment.

Some vegetation, bottomland, scattered cottonwood saplings, and large oak trees might be permanently disturbed and removed for the County Line Road overpass intersection improvements to West Beach. These impacts would be minor.

Trail construction on the IHB would result in minimal vegetation removal and disturbance to small deciduous sapling trees.

Elimination of one existing West Beach parking lot would result in removal of a 325-vehicle hard-surfaced parking lot area and return that portion to natural conditions by reseeding and revegetating an approximately 4.6-acre area. There would be temporary soil disturbance, displacement, and potential minor soil erosion resulting from regrading and shaping the sandy soil area.

Construction of the access road, parking lot, and foot/vehicle access trail to the breakwater/beach area would result in the permanent disturbance and removal of about 2.4 acres of backdune grass/shrub.

All impacts on vegetation would be permanent, and replanting might be required. Reseeding and landscaping of the disturbed areas of the smaller West Beach parking lot would return a total of about 4.6 acres to natural conditions.

In total, about 15.7 acres of undisturbed soils/vegetation with impermeable surfacing would be disturbed, and 4.6 acres would be reclaimed.

Wildlife. Under this alternative there would be definite impacts on wildlife from the new road and transit center construction activities, as well as the continuing traffic and visitor activities in areas where there had been very little disturbance. The new access road and transit center would permanently displace small mammals, birds, and waterfowl.

Threatened or Endangered Species. Development actions in the modified GMP alternative would result in significant impacts on known state-listed and federally protected threatened and endangered species. Extension of IN 51 through Tolleston Dunes to West Beach could disturb or eliminate several state-listed and federally protected plant species due to construction actions of road alignment. Appendix A identifies those species known to occur along the GMP proposed West Beach access route that would be affected.

Modification of the West Beach parking lot would not directly affect any known federal or state threatened and endangered species. Two federally protected and 19 state-listed plant and animal species do occur within the general area. Extreme care should be taken during obliteration and revegetation operations to avoid disturbance to these threatened and endangered species. Appendix A indicates those species in the West Beach parking lot area.

Development of the West Unit transit center and the extension of the West Unit access road/bridge to the Douglas Center and Montgomery Street could adversely affect a total of nine known state-listed and one federally protected threatened and endangered plant and animal species. Due to permanent ground disturbance actions. Appendix A identifies both state-listed plants and federally protected animal species along this development route. Again, special care and sensitivity must be taken to avoid any threatened or endangered species during trail siting, construction, and alignment.

Potential impacts on any threatened or endangered species along possible access routes to the preferred Gary marina site are addressed in the *Gary Marina Draft Environmental Impact Statement* (City of Gary 1989).

Coastal Zone Management. There would be no impacts in the coastal zone.

Water Resources. Ground-disturbing construction-related activities would directly affect water resources and result in temporary turbidity of wetlands and streams from runoff and soil erosion. Placement of hay bales or filter fabric along the construction perimeters would help reduce potential soil and water erosion.

West Unit access road, transit center, parking area, and bicycle and hiking trail construction would have minor impacts of temporary turbidity, groundwater, and water level disturbance on the water resources of the West Unit. Site selection, road alignment, and facility design can minimize obstruction to surface drainage flows. Increasing the amount of impervious surfaces (roads, parking areas, and buildings) would increase surface runoff and result in

some soil erosion and degradation of surface water quality. Under alternative 1, approximately 30 acres of natural ground surface would be paved. In contrast, 4.6 acres of pavement from the existing West Beach parking lot would be removed.

Runoff water from the new roadways, parking lots, and transit center could temporarily reduce and disrupt the adjacent wetland water chemical balance by the addition of petroleum substances. This would be minor and not adversely affect the existing water quality.

Floodplains/Wetlands. There would be no impacts on floodplains under this alternative. The Long Lake wetland area would be affected by the new access road because of the construction and placement of piers to support the bridge over this area. The development of the new hike/bike trail would not cause permanent disturbance of bottomland and marshy grassland vegetation. Water flow and movement of wildlife through the wetlands would be unimpeded by the bridge.

The West Beach road and bridge access through the Tolleston Dunes and the West Unit transit center site would affect 16.3 acres of wetlands by grading and adding fill material within a wetlands designated by the NWI. Designated NWI wetlands affected generally include palustrine emergent/forested broad-leaved deciduous and palustrine aquatic (see Floodplains and Wetlands map). Some of these wetlands contain a monoculture of purple loosestrife, a damaging exotic weed, which the national lakeshore would like to eliminate.

Construction actions affecting floodplains and fill within wetlands would require application for a Corps of Engineers (COE) section 404 permit and USFWS review. The COE would determine by established criteria the specific type of 404 permit required.

The state of Indiana requires several permit procedures relating to floodplains and wetlands. The Indiana Department of Environmental Management (IDEM) concurs with all COE nationwide and general permits. However, if the COE issues an individual section 404 permit, the IDEM, without any formal application requirements, publishes a public notice, and based on the response, IDEM either issues or denies a water quality certification.

Also, any construction project lying within a watershed or drainageway (stream, channel, ditch) of 1 square mile or greater would require an application and issuance of a "Construction in Floodway Permit." If wetlands might be affected, the IDNR Division of Water would also review and approve or disapprove water quality certification under the construction in floodway permit. The IDNR may require two additional permit requirements and formal application procedures. Any construction actions below the ordinary high water mark (579.6 feet International Great Lakes Dam or 581.1 feet mean sea level) would require a Lake Michigan permit.

Implementation of the Douglas Center and Montgomery Street connection routes off the Tolleston Dune bridge/road would have an impact on 0.3 acre of wetlands by grading and added fill material. Wetland types affected include palustrine emergent semipermanently flooded and palustrine emergent seasonally flooded.

Potential impacts on any designated NWI wetlands along possible access routes to the preferred Gary marina site are addressed in the 1989 *Gary Marina Draft Environmental Impact Statement*.

Air Quality. Vehicle access use along the IN 51 extension road/bridge would increase the localized and suspended particulate matter and pollution levels along this route. The impacts

on air quality resulting from West Beach traffic would not be a significant factor in the region's air quality because of the number and volume of industrial air pollution emissions.

There would be localized decreases in suspended particulates and carbon monoxide pollution levels on routes formerly used for access to West Beach (portions of US 12 and Lake-Porter County Line Road).

Impacts on Cultural Resources

Construction of a new West Beach access route as well as its associated bicycle paths, hiking trails, parking lots, transit center, and support structures would involve a considerable amount of ground disturbance, thereby causing potential adverse impacts on unknown archeological resources. In all cases, field surveys would be conducted by a professional archeologist before construction began. Also, during construction, ground-disturbing activities would be monitored by at least a paraprofessional archeologist. Any discoveries found during construction would be evaluated by an archeologist, and after consultation with the regional director, a decision would be made to either avoid the site or mitigate the impacts of construction on the site.

Procedures for new ground disturbance are delineated in the national lakeshore's *Resource Management Plan*. This plan reflects NPS policy as stated in NPS-2, NPS-28, Executive Order 11593, and other directives.

There are no cultural resources within the West Unit that are either on the National Register of Historic Places or deemed eligible for inclusion on the register.

Impacts on Visitor Use

The alternative actions that are proposed as part of the West Unit DCP could have a number of impacts on the use of that unit and of Indiana Dunes National Lakeshore. These impacts are related to the range of recreational opportunities in the national lakeshore, access to the West Unit, visitor orientation and information, and visitor safety.

The range of recreational opportunities within the lakeshore could be expanded by several proposed alternative actions. The improved use of the Gary pedestrian corridor would provide additional opportunities for walking or bicycling. A trail connection between the West and East units of the park would create an opportunity for nonmotorized travel through much of the length of the lakeshore.

An increase in interpretation within the West Unit, either at a transit center or along hiking trails, would increase the visitors awareness and appreciation for the resources of Indiana Dunes.

Access to West Beach would be improved by modifying the routes of approach, providing satellite parking lots with increased capacity, and using a shuttle bus system. Increasing the parking capacity for West Beach would increase the facility capacity of the unit, and, in turn, generate more visitation. It is uncertain how much additional use the unit could support before visitors began to notice a significant effect on the quality of their park experience or degradation of park resources.

It is difficult to determine the exact impacts that a transit center and shuttle would have on the national lakeshore experience. Some visitors would probably perceive a public

transportation system as convenient and enjoyable, and thus would heighten their enjoyment of the lakeshore. Other visitors might be disturbed because they are unable to park their personal vehicle close to the beach. These users would likely perceive a decline in the quality of their visitor experience.

The shuttle system might be more difficult for families who often have many items to carry to the beach such as blankets, coolers, toys, and picnic supplies. These difficulties could be mitigated by allowing a drop-off near the West Beach bathhouse. The driver would drop the family and beach equipment near the beach and then park the car at the transit center lot and take the shuttle bus to the beach. While this might seem very cumbersome, it could be viewed by some visitors as less inconvenient than parking a half-mile or more from the beach.

Visitor safety would be improved by eliminating at-grade railroad crossings and upgrading some intersections along the access route to West Beach.

Impacts on Socioeconomic Environment

The development actions that are proposed as part of the West Unit DCP could have a number of impacts on the communities surrounding Indiana Dunes National Lakeshore.

The construction of a West Beach access route along the IHB right-of-way could create an increase in the ambient noise levels in residential neighborhoods that are adjacent to the route. Any increase in noise levels should be largely limited to daytime hours, and might be partially mitigated by construction standards that include noise abatement designs.

There would be decreases in visitor traffic in most residential neighborhoods, as this proposed route could only be accessed by IN 51 or Montgomery Street. Illegal parking in Miller near West Beach would be reduced because of the direct access to Marquette Park. Property owners on Montgomery Street might notice an increase in noise and traffic volumes during those times that West Beach is full, when cars would be encouraged to divert to Marquette Park.

Any increase in traffic on existing surface streets could require improvements to the design or structure of those streets to accommodate the additional volume. Any necessary improvements would require a one-time capital improvement outlay, and, possibly, an increase in the ongoing maintenance budget.

The construction of new roadways, improvement of existing roadways, and development or modification of facilities could create short-term economic inputs to the local economy. Local contractors or laborers could be selected to implement these projects. Similarly, local businesses could provide materials that are needed for construction. Thus, the local economy could accrue income from payments for salaries, services, and supplies.

The actual construction or modification of facilities could create short-term negative impacts on the area immediately surrounding the projects. These short-term impacts would include possible increases in the levels of dust, ambient noise, and traffic.

The construction of a transit center could increase business seasonally at commercial establishments near the site.

ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Impacts on Natural Resources

Topography. Under the preferred alternative for access to West Beach, the general topography would be slightly modified along the two existing access routes. Access to West Beach via IN 51/US 20/County Line Road with the County Line Road overpass intersection improvements would result in moderate topographic disturbance and would require some regrading of the land surface. The interim intersection improvements requiring at-grade crossings and signalized intersection improvements within the existing road easement would result in no topographic disturbances.

West Beach access off I-90 using US 12/County Line Road would result in no impacts on topography.

Access to Marquette Park using existing roads (Hobart Road and Grand Boulevard) might require minor topographic disturbance. Intersection improvements along this access would all be within the existing road easement and/or previously disturbed areas.

Providing additional parking at West Beach through restriping of the existing parking lot would not affect topography.

The potential location of the West Unit transit center could be within sites previously disturbed. Sites would be evaluated when a need was demonstrated for the transit center.

Construction of an IHB hiking and biking trail would not cause any change in the existing topography.

Foot and vehicle access to and parking at the breakwater and beach area under passive use would not affect the topography. If the National Park Service should acquire the lands adjacent to the Portage/Burns Waterway owned by National Steel (hazardous lagoon site - Unit I-C), the existing road would be used for access to a parking lot near the beach. The parking lot would be located on previously disturbed lands to minimize impacts on topography. These impacts would be evaluated after the hazard site was successfully reclaimed and development proposals were undertaken.

Soils/Vegetation. West Beach access via IN 51/US 20 and US 20 routes with the County Line Road overpass intersection improvements would result in permanent disturbance, displacement, and compaction of bottomland soils on acreages not yet quantifiable. Minor soil erosion would occur until the disturbed areas were revegetated. Overpass construction improvements could be contained within the existing road easement. The interim at-grade crossing intersection improvements would not affect soils.

According to the 1984 *Trail Plan* approximately 10.0 miles of primarily hiking trails (2 to 4 feet wide) and some cross-country skiing trails (1-1/2 to 3 feet wide) are proposed within Miller Woods and along the IHB/Gary pedestrian corridor. Construction of the proposed IHB hike/bike and hiking trails would cause some surface soil disturbance. New hiking trail development of approximately 67,500 linear feet would result in the temporary erosion of sandy dune soils and the permanent disturbance, soil compaction, and reduced water infiltration of 14.3 acres of bottomland forest and marshy grassland soils.

Foot and vehicle access to the breakwater/beach area adjacent to the east of Ogden Dunes would result in permanent disturbance of 2.4 acres of backdune sandy soils. Dune soils

would be subject to temporary soil erosion, permanent compaction, and reduced water infiltration.

Adjacent to the Long Lake wetland some vegetation and scattered cottonwood saplings would be permanently disturbed and removed for the County Line Road/US 12 overpass intersection improvements. These areas would be within the County Line Road 100-foot right-of-way. In addition, previously disturbed lands in the southwest quadrant of the US 12 County Line Road intersection would be permanently disturbed. These two areas would total of 5.7 acres.

Hike/bike trail construction on the IHB would result in minimal vegetation removal and disturbance to small deciduous sapling trees. Development of the new hiking trail paralleling the IHB would cause permanent disturbance of 7,800 linear feet trail or about 1.8 acres of bottomland and marshy grassland vegetation.

Construction of the 20-car parking lot and foot/vehicle access trail to the breakwater/beach area would result in the permanent disturbance and removal of about 0.2 acre of backdune grass/shrub and upland deciduous tree cover.

Wildlife. The West Unit development of the IHB hike/bike and hiking trail would cause a temporary displacement of primarily small mammals, birds, and waterfowl. A minimal number of some small ground-dwelling mammals might be permanently displaced. An increase in visitor use of the trails might slightly reduce the occurrence of wildlife observed. Overall, wildlife populations would not be adversely affected by trail construction and use.

Trail access and use to the breakwater/beach area would result in minor temporary impacts on wildlife. Impacts on wildlife for this trail would be the same as for the IHB hike/bike and hiking trail described above.

Threatened and Endangered Species. Access to West Beach along existing routes and intersection improvements would not affect any known state-listed or federally protected threatened and endangered plant and animal species.

Under this alternative, the IHB hike/bike trail would traverse areas known to have threatened and endangered plant and animal species (see appendix A for those species known to occur along this trail). Special care and sensitivity would be required during IHB trail siting, construction, and alignment.

Development of the hiking trail in Miller Woods could possibly result in displacing or disturbing both state-listed and federally protected threatened and endangered plant and animal species (see appendix A for those species known to occur along this hiking trail segment). Special care would be required during hiking trail construction and alignment.

Parking and foot/vehicle access to the breakwater/beach area could disturb or displace several known threatened and endangered plant and animal species (see appendix A for those species known to be present in the access area). Special care would be required during trail siting, alignment, and construction.

The potential West Unit transit center construction between the Zayre parking lot on US 20 might affect the state-listed endangered plant Clinton lily (*Clintonia borealis*). These impacts would be evaluated when a need for the transit center was demonstrated. If the transit center was located at the truck terminal site near US 12 and Hobart Road, there would be no impacts on threatened and endangered species.

Potential impacts on any threatened and endangered species along possible access routes to the preferred Gary marina site are addressed in the *Gary Marina Draft Environmental Impact Statement* (City of Gary 1989).

Coastal Zone Management. There would be no impacts on the coastal zone shoreline.

Water Resources. There would be no impacts on water resources resulting from the proposed development actions under this alternative.

There would be no identifiable direct impacts on the water quality from development actions in the West Unit. Ground-disturbing, construction-related activities would result in temporary turbidity of wetlands and streams from runoff and soil erosion. Increased use of the West Beach access routes and parking areas is not anticipated to further affect water quality as a result of vehicle petroleum leaks and runoff.

Floodplains/Wetlands. There would be no impacts on the floodplains under this alternative. Foot trails, small parking lots, and access roads are excepted actions under Executive Order 11998, "Floodplain Management," dated May 24, 1977.

Under this preferred alternative, wetlands would not be affected by development actions within the West Unit. Proposed intersection improvements and overpass construction would not result in grading and added fill material within a designated NWI wetland. Impacts on wetlands would be avoided by the use of retaining walls for intersection approach widening and the US 12 overpass.

The COE, IDEM, and IDNR permit requirements would also apply to this alternative because of development actions that might affect floodplains and/or wetlands.

Potential impacts on any designated NWI wetlands along possible access routes to the preferred Gary marina site are addressed in the 1989 *Gary Marina Draft Environmental Impact Statement*.

Air Quality. The overall air quality levels in the general West Unit area would not be significantly affected by West Unit/West Beach visitation. There would be localized decreases in suspended particulates and carbon monoxide pollution levels in the US 12 and Lake-Porter County Line Road access because of improved traffic flow from intersection improvements.

Impacts on Cultural Resources

The improvement to existing streets, the overpass bridge, bicycle paths, hiking trails, parking areas, and other support structures would involve new ground disturbance. The only difference between this alternative and alternative 1 would be the location of the ground-disturbing activities. There would be less ground disturbance under this alternative, but that does not lessen the requirement for vigilance regarding the preservation of archeological remains. This includes a field survey prior to construction, monitoring ground-disturbing activities, and consultation with authorities upon discovering artifacts during construction. Procedures for new ground disturbance are delineated in the national lakeshore's *Resource Management Plan* and reflect NPS policies as stated in NPS-2, NPS-28, Executive Order 11593, and other directives.

Impacts on Visitor Use

The development actions that are proposed as part of the West Unit DCP could have a number of impacts on the use of that unit and of Indiana Dunes National Lakeshore. These impacts are related to the range of recreational opportunities within the park, access to the West Unit, visitor orientation and information, and visitor safety. Visitor use impacts would be the same under the preferred alternative as those described for alternative 1. Impacts related to a transit center and shuttle bus system would be contingent on future determination of a need for public transportation.

Impacts on Socioeconomic Environment

The alternative diversion of West Beach traffic to Marquette Park via US 20, Hobart Road, and Grand Avenue could have similar impacts on property owners along that route. Increases in traffic and ambient noise could be expected when West Beach was full. Commercial establishments along Grand Avenue might also notice a seasonal increase in business during these times.

The possible construction of a transit center would require the purchase of private property, and could also increase business at commercial establishments near the site(s).

ALTERNATIVE 3: NO-ACTION

Impacts on Natural Resources

Topography/Soils/Vegetation. Under the no-action alternative and with continued park operations, there would be no known increased or significant impacts on topography, soils, and vegetation in the West Unit.

Wildlife. With the continuation of park operations and management of the area as it now exists, there would be no increased or major impacts on wildlife anticipated.

Threatened and Endangered Species. Under this no-action alternative, there would be no direct impacts or disturbance to known state-listed and federally protected threatened and endangered species. Complete protection and preservation of all known or suspected occurrences of threatened and endangered species would continue to be enforced.

Coastal Zone Management. There would be no known impacts in the coastal zone.

Water Resources. There would be no significant impacts on water resources or water quality in the West Unit under this alternative. Water quality levels compared to the IDEM standards would remain about the same in the West Unit. Continued water quality monitoring and baseline data collection would be analyzed and evaluated. No development actions in the West Unit might maintain water quality levels at the current IDEM standards and gradually improve them over time through monitoring controls.

Floodplains/Wetlands. With current national lakeshore operations and management, there would be no direct impacts on floodplains and wetlands in the West Unit. Continued protection and preservation of the floodplains and wetlands would occur.

Air Quality. There would be no noticeable impact on the overall air quality of the West Unit. Suspended particulates and carbon monoxide pollution levels (resulting from idling vehicles)

would be elevated in localized areas along Lake-Porter County Line Road on the 20-30 peak summer weekends when traffic congestion occurs.

Impacts on Cultural Resources

Current developments in the national lakeshore are being undertaken with the requisite archeological surveys prior to construction. There would be no further requirements for additional surveys unless these projects deviate from the original plans and disturb new ground. The provisions of the lakeshore's *Resource Management Plan* apply in any case.

Impacts on Visitor Use

There would be no expansion of recreational opportunities within the lakeshore. Visitor safety would continue to be compromised by at-grade railroad crossings.

Impacts on Socioeconomic Environment

The no-action alternative would not have significant impacts on social or economic conditions in the area surrounding the West Unit. There would continue to be impacts on Miller residents resulting from County Line Road congestion, increased traffic through the residential neighborhoods, and illegal parking.

TABLE 3: SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES

IMPACT TOPIC	ALTERNATIVE 1	ALTERNATIVE 2 (PREFERRED)	ALTERNATIVE 3 (NO ACTION)
NATURAL RESOURCES			
Soils/Vegetation	<p>1.5 acres of dune soil permanently disturbed in undisturbed area for new West Beach road and bridge; 1.8 acres of dune soil permanently disturbed in previously disturbed IHB; 4.6 acres reclaimed for parking lot removal</p> <p>0.3 acre of upland soils permanently disturbed in undisturbed area for Montgomery Road connection; 2.4 acres of backdune soils/grassy vegetation permanently disturbed in undisturbed area for beach access road, parking lot, and trail</p> <p>11.5 acres of dune soil/vegetation and landscape permanently disturbed in undisturbed Tolleston Dunes area for West Unit transit center</p>	<p>Minor permanent disturbance of dune landscape and soils/vegetation in undisturbed area for intersection improvements; minor soil erosion</p> <p>14,200 LF new trail construction; permanent disturbance to 2.6 acres of dune soils/vegetation at West Beach; 6,000 LF or 1.1 acres of soils/vegetation permanently disturbed on Miller Woods trail; 13.2 acres of soils/vegetation permanently disturbed in undisturbed area for 61,500 LF of new hike/bike and hiking trails (Gary pedestrian corridor); 8,500 LF or 2.4 acres of soils/vegetation permanently disturbed in undisturbed area for beach access parking lot and trail</p> <p>5.5 acres of dune landscape permanently disturbed in previously disturbed area for West Unit transit center adjacent to US 20</p>	<p>Generally, no natural and cultural resource impacts. Since this is a GMP amendment, natural and cultural resources would continue to be protected by the 1980 GMP and subsequent resource management plans.</p>
Wildlife and Fish	<p>Minor but visible temporary and permanent disturbance and displacement</p>	<p>Same as alternative 1</p>	<p>No effect</p>
Threatened and Endangered Species	<p>6 state-listed special potentially affected along new IN 52 extension to West Beach; 4 state and 1 federal listed species by IN 51 extension/bridge/IHB to West Beach</p> <p>18 state listed and 1 federally protected species potentially affected by hiking trail/beach access parking lot; 3 state-listed species potentially affected by Montgomery Road connection</p>	<p>No effect</p> <p>16 state-listed and 2 federally protected species potentially affected by new trail construction; 14 state-listed and 2 federally protected species potentially affected by IHB hike/bike trail; 18 state-listed and 1 federally protected species potentially affected by beach access parking lot/hiking trail</p>	<p>No effect</p>

Table 3 (cont.)

IMPACT TOPIC	ALTERNATIVE 1	ALTERNATIVE 2 (PREFERRED)	ALTERNATIVE 3 (NO ACTION)
Threatened and Endangered Species (cont.)	9 state-listed and 1 federally protected species potentially affected by West Unit transit center construction	Same as alternative 1	
Air Quality	Some minor increase in suspended particulates	No overall effect; localized decreases in particulates and carbon monoxide	Continued localized higher particulates and carbon monoxide due to traffic congestion at US 12 and Lake-Porter County Line Line Road on peak visitation weekends
Water Resources	Minor temporary water turbidity to wetlands along West Beach access IN 51 extension/bridge/IHB and hike/bike trail construction Minor temporary water turbidity to wetlands along hike/bike and hiking trail areas	Minor temporary water turbidity to wetlands from hike/bike trail construction Same as alternative 1	
Floodplains and Wetlands	16.3 acres of wetlands permanently disturbed for West Beach road and bridge access and West Unit transit center; 0.3 acre of wetlands disturbed for Montgomery Road connection	Minor permanent disturbance of wetlands for intersection improvements and general construction activities	No effect
CULTURAL RESOURCES	No wetlands affected by hike/bike IHB trail	Same as alternative 1	
Prehistoric and Historic	Field surveys required prior to any construction	Same as alternative 1	Same as alternative 1
VISITOR USE	Possible growth in visitation to the unit due to access improvements Wider range of recreational opportunities in the unit available to visitors Implementation of shuttle system possible deterrent to some users of West Beach More land available for visitor use	Same as alternative 1 Same as alternative 1 Same as alternative 1 Same as alternative 1	No effect

Table 3 (cont.)

IMPACT TOPIC	ALTERNATIVE 1	ALTERNATIVE 2 (PREFERRED)	ALTERNATIVE 3 (NO ACTION)
SOCIOECONOMIC ENVIRONMENT			
Regional Economy	Short-term economic gains relating to construction of access routes	Possible seasonal increase in expenditures at Grand Avenue businesses because of diversion of overflow West Beach traffic to Marquette Park	Miller residents would continue to be affected by County Line Road congestion, increased through-traffic, and illegal parking.
	Short-term economic gains relating to construction of facilities	Same as alternative 1	
	Possible seasonal increase in business at establishments near West Unit transit center	Same as alternative 1	
	Removal of commercial establishments in LC-2		
	Possible increase in ambient noise levels in neighborhoods adjacent to new access route; decrease in visitor traffic in most residential areas; possible short-term increases in noise, dust, and traffic relating to construction of new access	Possible short-term increases in noise, dust, and traffic relating to construction activities.	Continued traffic congestion on US 12 and Lake-Porter County Line Road on peak visitation weekends
Aesthetics	Short-term increases in noise, dust, and traffic relating to general construction activities	Same as alternative 1	

CONSULTATION AND COORDINATION

AGENCIES AND INTEREST GROUPS

The agencies listed below have been consulted and have provided assistance and information in the preparation of this document.

Department of Defense
U.S. Army Corps of Engineers
U.S. Department of Agriculture
Soil Conservation Service
U.S. Department of the Interior
Fish and Wildlife Service
Geological Survey
U.S. Department of Transportation
Federal Highway Administration
U.S. Environmental Protection Agency
State Historic Preservation Officer
Indiana Department of Natural Resources
Division of Fish and Wildlife
Division of Natural Preserves
Division of Water
Indiana Department of Transportation
Northern Indiana Commuter Transportation District
Northwestern Indiana Regional Planning Commission
Northern Indiana Public Service Company
Lake Michigan Marina Development Commission
National Steel Corporation
Little Calumet River Basin Development Commission
Counties of Porter and Lake
City of Gary
Towns of Ogden Dunes, Porter, and Lake Station
Miller Citizens Corporation
Miller Area Business Associates
Chambers of Commerce
Save the Dunes Council
Sierra Club
Audubon Society
Izaak Walton League of America

SCOPING ISSUES MEETINGS

The planning team has met with local organizations, interest groups, industry, government agencies and officials (local, county, city, state, and federal) to identify issues and inform affected parties about the GMP amendment and West Unit DCP process and status. The planning team has used the park *Friends* newsletter (*Singing Sands*), the superintendent's advisory group, special interest groups, industries, and local news media (radio and newspapers) to inform the public of the planning efforts and seek input on the issues to be addressed. Public scoping meetings for the GMP amendment and West Unit DCP were held at the Douglas Center and the NPS visitor center in June 1989. Public meetings will be held on the draft GMP amendment and West Unit DCP/EA.

Public Scoping Meetings:

Douglas Center - June 21, 1989

Visitor Center - June 22, 1989

Agency and Local Official Scoping meeting - June 21, 1989

Meeting with Agency and Local Officials to discuss preliminary alternatives -
September 27, 1989

A presentation and discussion was held with the Superintendent's advisory group on July 28, 1989.

APPENDIX A: WEST UNIT – THREATENED AND ENDANGERED SPECIES

Scientific Name	Common Name	Status	
		Fed.	State

Plants

<i>Ammophila breviligulata</i>	Marram grass		WL
<i>Aralia hispida</i>	Bristly (spiny) sarsaparilla		SE
<i>Arctostaphylos uva-ursi</i>	Bearberry (St. John's wort)		SR
<i>Arenaria stricta</i>	Stiff sandwort		ST
<i>Aristida intermedia</i>	Slim-spike three-awn grass (Seabeach needlegrass)		ST
<i>Aristida tuberculosa</i>	Beach three-awn grass		ST
<i>Aster furcatus</i>	Forking (forked) aster	C2	SE
<i>Aster junciformis</i>	Rushlike aster		SR
<i>Aster ptarmicoides</i>	Stiff aster		ST
<i>Aster sericeus</i>	Bush aster		SR
<i>Cakile edentula</i> var. <i>lacustris</i>	American sea-rocket		ST
<i>Carex alata</i>	Brown-winged sedge		SR
<i>Carex aurea</i>	Golden fruit (golden sedge)		ST
<i>Carex eburnea</i>	Ebony sedge		ST
<i>Carex garberi</i>	Elk (false golden) sedge		ST
<i>Carex leptalea</i>	Bristly-stalk sedge		WL
<i>Chimaphila maculata</i>	Spotted wintergreen		WL
<i>Chimaphila umbellata</i> var. <i>cisatlantica</i>	Pipsissewa (prince's) pine		ST
<i>Cirsium pitcheri</i>	Dune (sand) thistle	T	ST
<i>Clintonia borealis</i>	Clinton lily		SE
<i>Comptonia peregrina</i>	Sweet fern		SR
<i>Cornus amomum</i>	Silky dogwood		SE
<i>Cornus canadensis</i>	Bunchberry		SE
<i>Cornus rugosa</i>	Roundleaf (speckled) dogwood		ST
<i>Cypripedium acaule</i>	Pink Lady's slipper		WL
<i>Diervilla lonicera</i>	Bush honeysuckle		SR
<i>Drosera intermedia</i>	Spoon-leaved sundew		SR
<i>Eleocharis geniculata</i>	Capitate (panne) spike-rush		SE
<i>Eleocharis pauciflora</i>	Few flower spikerush (Prairie goldenrod)		SR
<i>Equisetum variegatum</i>	Variiegated horsetail		SE
<i>Euphorbia polygonifolia</i>	Seaside spurge		ST
<i>Gentiana puberula</i> <i>cisatlantica</i>	Downy (prairie) gentian pine		SR
<i>Glyceria borealis</i>	Northern manna grass		SE
<i>Habenaria ciliaris</i>	Orange fringed orchid		SE
<i>Habenaria clavellata</i>	Small-green fringed orchid		SR
<i>Tubercled orchid</i>	<i>Habenaria flava</i>		SR
Northern fringed orchid	<i>Habenaria hyperborea</i>		ST
Sand (false) heather	<i>Hudsonia tomentosa</i>		ST

West Beach Access	IHB Hike/Bike Trail	Hiking Trail	Breakwater/Beach Access	IN 51 Ext. Bridge-IHB	West Beach Parking Lot	RD Ext. Doug. Ctr-Mont.St	West Unit Transit Ctr
			X		X		
			X		X		X
					X		
				X			X
			X		X		
X	X		X				
	X	X					
	X	X	X		X		
			X		X		
			X		X		
					X		
			X		X		
					X		
			X		X		
X	X	X	X	X	X	X	X
			X		X		
					X		
	X	X					
			X				
			X				
							X

APPENDIX A (Cont.)

Scientific Name	Common Name	Status Fed. State	West	IHB H Trail	Hiking	Break Access	IN 51	West	RD Ex	West
<i>Hypericum kalmianum</i>	Kalm hypericum	SR	X	X	X	X		X	X	
<i>Juncus balticus</i> var. <i>littoralis</i>	Rush	WL	X	X	X	X		X		X
<i>Juncus pelocarpus</i>	Brown-fruited rush (Ground juniper)	ST		X						
<i>Juncus scirpoides</i>	Round-headed rush	SE								X
<i>Juniperus communis</i>	Dunes juniper	SR				X		X		
<i>Lathyrus maritimus</i> var. <i>glaber</i>	Beach pea	SE								
<i>Liparis loeselii</i>	Loesel's (green) tway blade	WL						X		
<i>Ludwigia sphaerocarpa</i>	Globe-fruited false- loosestrife	SE			X					
<i>Lycopodium inundatum</i>	Northern bog clubmoss	SE								
<i>Melampyrum lineare</i>	American cow-wheat	ST								
<i>Menyanthes trifoliata</i>	Buckbean	WL		X						
<i>Myosotis laxa</i>	Smaller forget-me-not	SE								
<i>Nemopanthus mucronatus</i>	Mountain holly	SR			X					
<i>Oryzopsis racemosa</i>	Black-fruit mountain- ricegrass	SE								
<i>Panicum boreale</i>	Northern panic grass	SR	X							
<i>Perideridia americana</i>	Eastern eulophus	SE								
<i>Pinus banksiana</i>	Jack pine	SR				X				
<i>Plantago cordata</i>	Heart-leaved plantain	SE								
<i>Platanthera ciliaris</i>	Yellow-fringe orchis	SE								
<i>Platanthera clavellata</i>	Small green woodland orchis	SR								
<i>Platanthera flava</i> var. <i>herbiola</i>	Northern rein-orchid	SR			X					
<i>Platanthera hyperborea</i>	Leafy northern green orchis	ST								
<i>Polygonella articulata</i>	Eastern jointweed	ST		X	X			X		X
<i>Polygonum hydropi- peroides</i> var. <i>setaceum</i>	Swamp smartweed	SE				X			X	
<i>Polyonia (pogonia) ophioglossoides</i>	Rose pogonia	SR		X	X					
<i>Potamogeton pusillus</i>	Small pondweed	SR			X					
<i>Potentilla anserina</i>	Silverweed	SE								
<i>Prunus pennsylvanica</i>	Fire (pin) cherry	SR	X	X	X		X		X	
<i>Pyrola rotundifolia</i> var. <i>americana</i>	Round leaved shin-leaf American wintergreen	SR								
<i>Rhamnus alnifolia</i>	Alderleaf buckthorn	WL								
<i>Rhus trilobata</i> var. <i>arenaria</i>	Beach (sand fragrant) sumac	ST		X	X		X	X		
<i>Rhynchospora macro- stachya</i>	Giant beak rush	SR								
<i>Salix cordata</i>	Heartleaf willow	ST								
<i>Salix syrticola</i>	Dune willow	ST				X		X		
<i>Satureja (arkansana) glabella</i> var. <i>angustifolia</i>	Low calamint	SE								

APPENDIX A (Cont.)

Scientific Name	Common Name	Status	
		Fed.	State
<i>Scirpus hallii</i>	Hall's sedge		SE
<i>Scirpus subterminalis</i>	Water bullrush		ST
<i>Scleria reticularis</i>	Netted nutrush		SE
<i>Selaginella rupestris</i>	Ledge spike-moss		ST
<i>Solidago racemosa</i>	Dune goldenrod		ST
var. <i>gillmanii</i>			
<i>Solidago spathulata</i>	Sticky goldenrod		ST
var. <i>gillmanii</i>			
<i>Talinum rugospermum</i>	Prairie fame-flower	C2	SE
<i>Trichostema dichotomum</i>	Bluecurls		SR
<i>Utricularia cornuta</i>	Horned bladderwort		ST
<i>Utricularia purpurea</i>	Purple bladderwort		SR
<i>Utricularia subulata</i>	Closed bladderwort		SE
var. <i>cleistogama</i>			
<i>Vaccinium macrocarpon</i>	Large cranberry		WL
<i>Viola blanda</i>	Redstem wild violet		ST

Arthropods

Karner blue butterfly *Lycaeides melissa samuelis* C2 SE

Amphibians/Reptiles

<i>Ambystoma laterale</i>	Blue-spotted salamander	SSC
<i>Ambystoma platineum</i>	Silvery salamander	WL
<i>Ambystoma tremblayi</i>	Tremblay's salamander	WL
<i>Clemmys guttata</i>	Spotted turtle	ST
<i>Clonophis kirtlandii</i>	Kirkland's snake	C2 ST
<i>Emydoidea blandingii</i>	Blanding's turtle	SSC
<i>Opheodrys vernalis blanchard</i>	Western smooth green snake	ST
<i>Pseudacris triseriata</i>	Striped (western) chorus frog	SSC
<i>Rana pipiens</i>	Northern leopard frog	SSC
<i>Sistrurus catenatus</i>	Eastern massasauga	C2 ST
<i>Thamnophis proximus</i>	Western ribbon snake	SSC

Birds

<i>Accipiter cooperii</i>	Cooper's hawk		SSC
<i>Botaurus lentiginosus</i>	American bittern		SE
<i>Falco peregrinus</i>	Peregrine falcon	E	SE
<i>Ixobrychus exilis</i>	Least bittern		SSC
<i>Rallus elegans</i>	King rail		SE

Mammals

Franklin's ground squirrel	<i>Spermophilus franklinii</i>	SSC
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[illegible]

APPENDIX A (Cont.)

Keys:

Federally listed threatened and endangered species

- T ■ Threatened
- C2 ■ Category 2 (candidate)

State-listed threatened and endangered species

- SE ■ Endangered
- ST ■ Threatened
- SR ■ Rare
- SSC ■ Special Concern
- WL ■ Watch List

Sources: Indiana Department of Natural Resources; U.S. Fish and Wildlife Service; Resetar 1988, 1989

APPENDIX B: DESCRIPTION OF ALTERNATIVE 1 – MODIFIED 1980 GMP WEST BEACH ACCESS ROAD

The road will appear to be an extension of IN 51. It originates at the intersection of US 20 and IN 51, proceeding northward between the Zayre and K-Mart shopping centers and over the Baltimore & Ohio Railroad tracks.

Two entrance alternatives have been developed. Both alternatives provide a gate to close the road and a turnaround area between US 20 and the gate. Both alternatives also provide an underpass linking the K-Mart and Zayre shopping centers at Station 106+00. The overpass at this point is labeled Bridge No. 1. The main difference between the alternatives is the use of reinforced earth walls for alternative 1 and 2:1 fill slopes for alternative 2. Advantages gained in alternative 1 include lower maintenance costs and use of materials that are compatible with surrounding urban structures. The advantage to alternative 2 is lower initial construction cost.

Preliminary estimates indicate that the use of reinforced earth walls could cost as much as \$290,000 more than 2:1 fill slopes. During final design, savings may be realized which reduce the cost differential as a result of shorter bridge spans and long-term life cycle cost factors resulting from lower maintenance requirements. Final design solutions will consider these additional factors.

Neither alternative provides for direct access to the shopping centers from the West Unit access road. Currently there is access to the shopping centers from the US 20/IN 51 intersection. However, there is some question as to whether this access was permitted by the state of Indiana. The engineering aspects of providing access from the West Unit access road to the shopping centers were studied by the Federal Highway Administration. A letter from the division engineer of the Federal Highway Administration to the manager of the Denver Service Center dated April 13, 1984, stated: "Our studies on the intersection with an access/egress to the shopping centers from the access road have presented major problems in geometrics and safety. . . . We, therefore, recommend that the intersection be designed without providing an access/egress to the shopping centers directly off West Beach Access Road." Access to the shopping centers is provided at two points along US 20, and additional access points can be added. The underpass described above will provide for access between the shopping centers.

North of the shopping center, the road passes over the Baltimore & Ohio Railroad tracks by means of a two-lane bridge (Bridge No. 2) with a walkway on the east side. The embankment to the north and south of this bridge will be installed with a 2:1 slope. On the south side, the base of the embankment will be kept within the right-of-way lines by construction of retaining walls as needed.

In the area to the northeast of Bridge No. 2, the West Unit Transit Center would be constructed. This facility will include parking for 800 vehicles (phased construction), a transit center building or shelter, and a boarding area for the West Unit shuttle system. When the West Beach parking lot has been filled to capacity, visitors will park their cars at this facility and take the shuttle to West Beach or the Environmental Education Center. The exact layout of this facility is not yet determined.

Just past the transit center site, the road turns to the west for about 1,500 feet, where it begins a broad 180-degree turn back to the east. By following the western edge of the area, both environmental and aesthetic impacts of road construction through the wetlands will be minimized and uninterrupted views of the Long Lake area will be provided. This horizontal curve coincides with a vertical curve that rises over US 12, South Shore Railroad, woodlands, power lines, Conrail Railroad, and Long Lake wetland. This structure, Bridge No. 3, is approximately 1,700 feet long. The far end of the horizontal and vertical curves tie into the alignment of the abandoned IHB Railroad.

The bridges are proposed to provide a continuous roadway without interruption for the interstate traveler for safety, aesthetic, and environmental reasons. The roadway is to be the major gateway to the West Unit of the national lakeshore. The elevated structures avoid heavy rail traffic of freight transportation and numerous commuter trains. On-grade crossings would require considerable track alteration since some are not parallel in elevation, besides the obvious safety problems.

A short distance beyond Bridge No. 3, at Station 174+00, the spur road to the Environmental Education Center takes off to the west. The spur road is not being designed as part of this project, but the at-grade alignment for this intersection is being designed to allow for future construction.

The remainder of the West Unit access road follows the abandoned IHB railroad alignment, except for a stretch (Station 200 to 222), which follows a slightly more northerly route through an area of open sand. The road then returns to the IHB alignment, passes under County Line Road bridge and connects to the existing West Beach entrance road. Two service roads will connect to the West Unit access road, one at Station 251+00 left and the other at Station 259+55 right. The service roads will provide a connection between County Line Road and West Unit access road, to be used by park and emergency vehicles. A gate on each of the service roads at its connection to County Line Road will prevent the public from entering the park via the service roads.

Beginning at U.S. 20, the alternative West Unit access road has a 12-foot paved lane width for the first 1,200 feet, gradually narrowing to 11 feet, with a 6-foot paved shoulder on each side. Elsewhere, the road has a typical paved lane width of 11 feet with a 4-foot gravel shoulder on each side. The typical cross-slope on the pavement is 2 percent, and on the shoulder it is 8 percent. The design speed for the road is between 35 and 40 miles per hour, although the posted speed will be no more than 35 miles per hour. The maximum superelevation is 6 percent. Gradient on-cut slopes and fill slopes will vary from 2:1 to 4:1, depending on existing conditions.

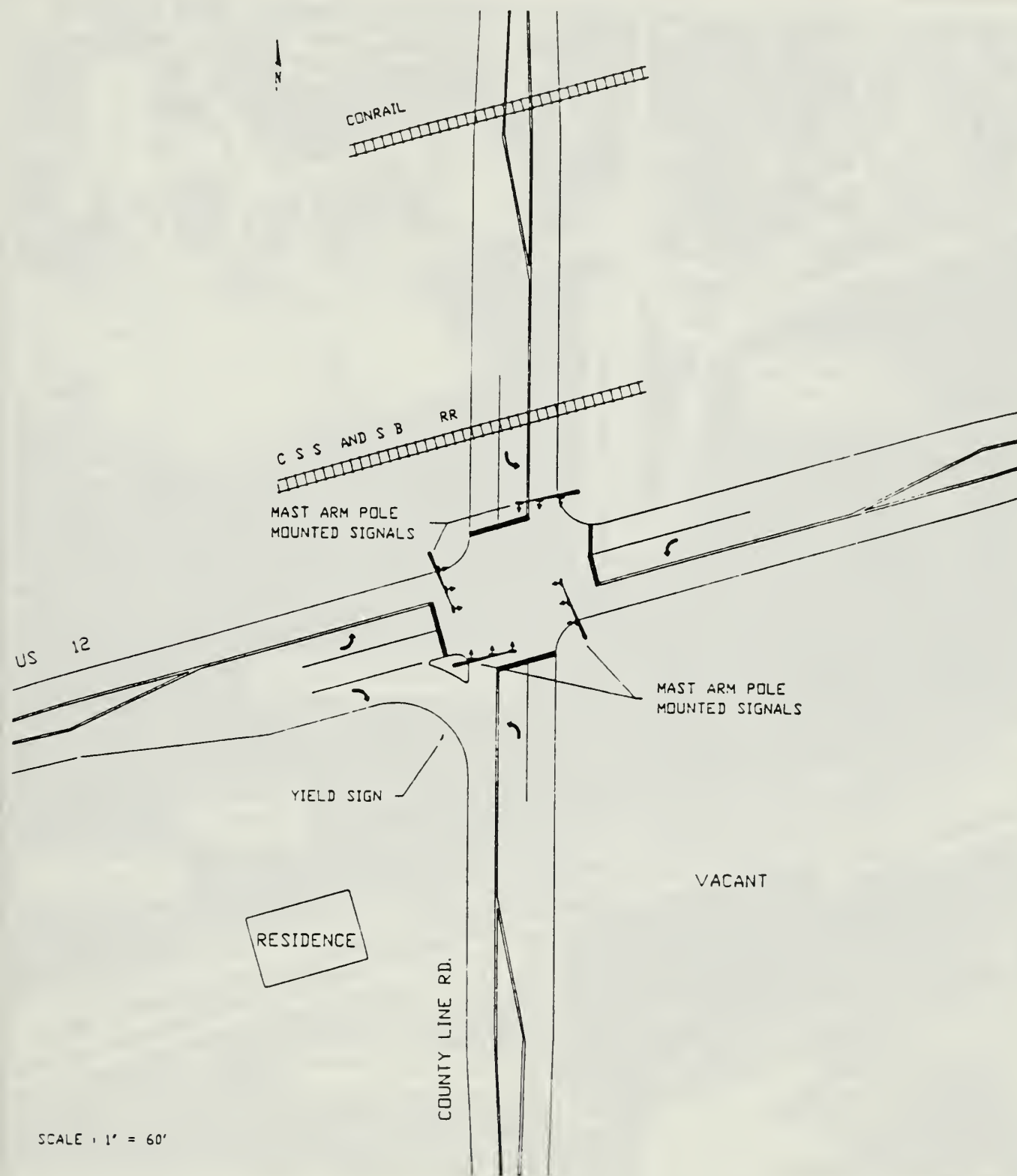
A hiking trail and a bicycle trail will merge into one trail and closely parallel the road alignment where necessary (on bridges and embankments). Elsewhere the two trails will follow separate scenic alignments through the woods and along the marshes. A preliminary alignment for the bicycle trail is shown on the drawings, subject to adjustment in the field.

Wherever possible, the bicycle trail is separated from the roadway to enhance safety and visitor experience and to reduce construction costs. In those instances where the road is built on fill approaches to bridge structures, or in areas with restricted right-of-way, the trail parallels the roadway with a 6-foot paved shoulder separation. On bridge structures, the trail/walkway is raised 6 inches above the road surface, with a curb and low safety railing between the trail and the 6-foot road shoulder.

In other areas, the trail follows an independent alignment for a total of 8,000 feet, for the most part using existing road, railroad, and trail scars.

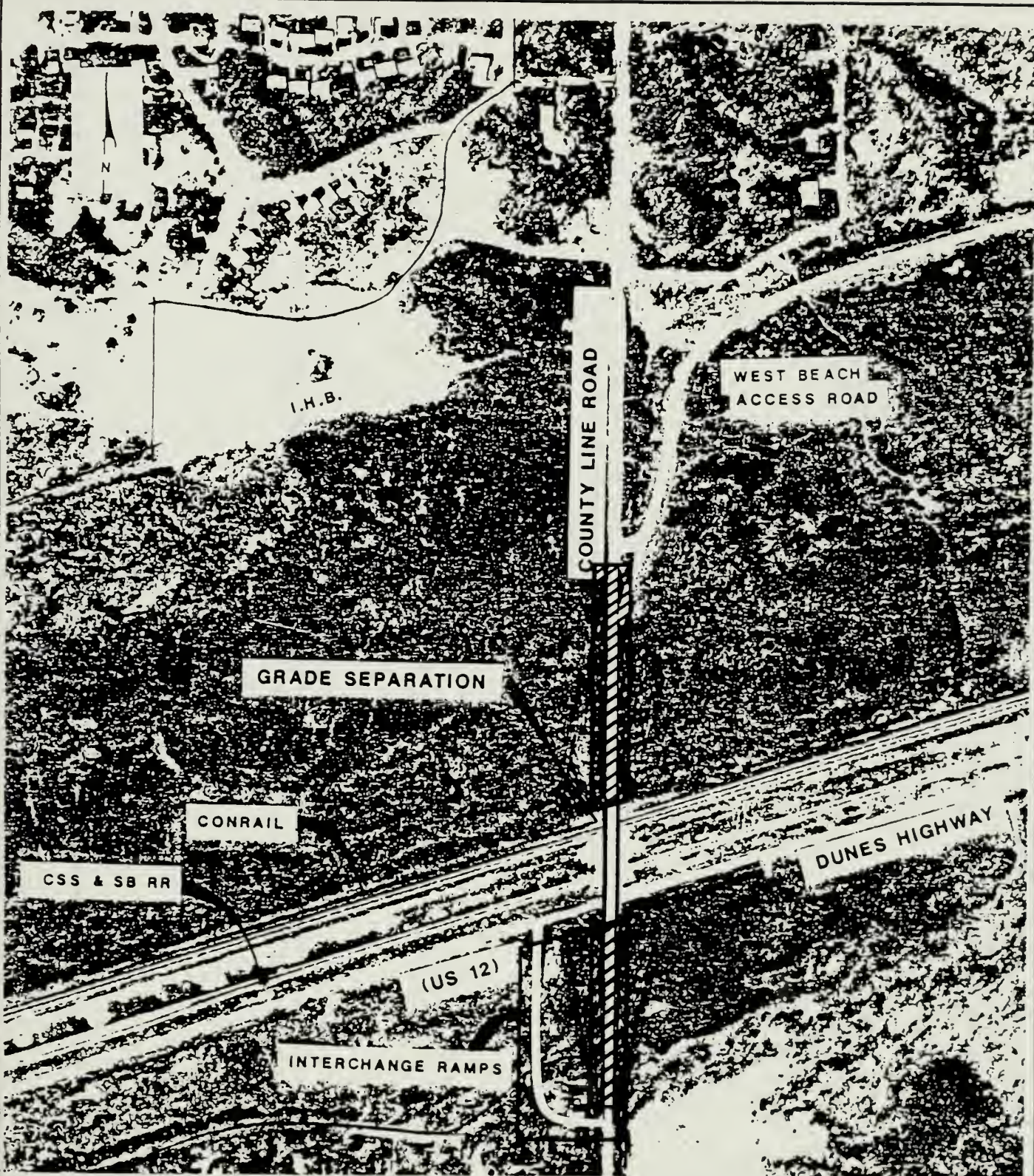
All borrow material (except that available from excavation on this job) and all aggregate will be imported from outside the park. The Environmental Education Center spur road, which is located on the abandoned IHB railroad grade could be lowered in grade to a profile design in order to obtain a large quantity of fill material at considerable savings. This material could be used to construct the north embankment of Bridge No. 3. Construction of the spur road, which is not included in this project, could be accomplished at a later date. At that time funds would be required only for the base and paving of the spur road, since the grading to desired subgrade elevation would already have been accomplished.

APPENDIX C: DIAGRAMS OF RECOMMENDED INTERIM AND OVERPASS IMPROVEMENTS



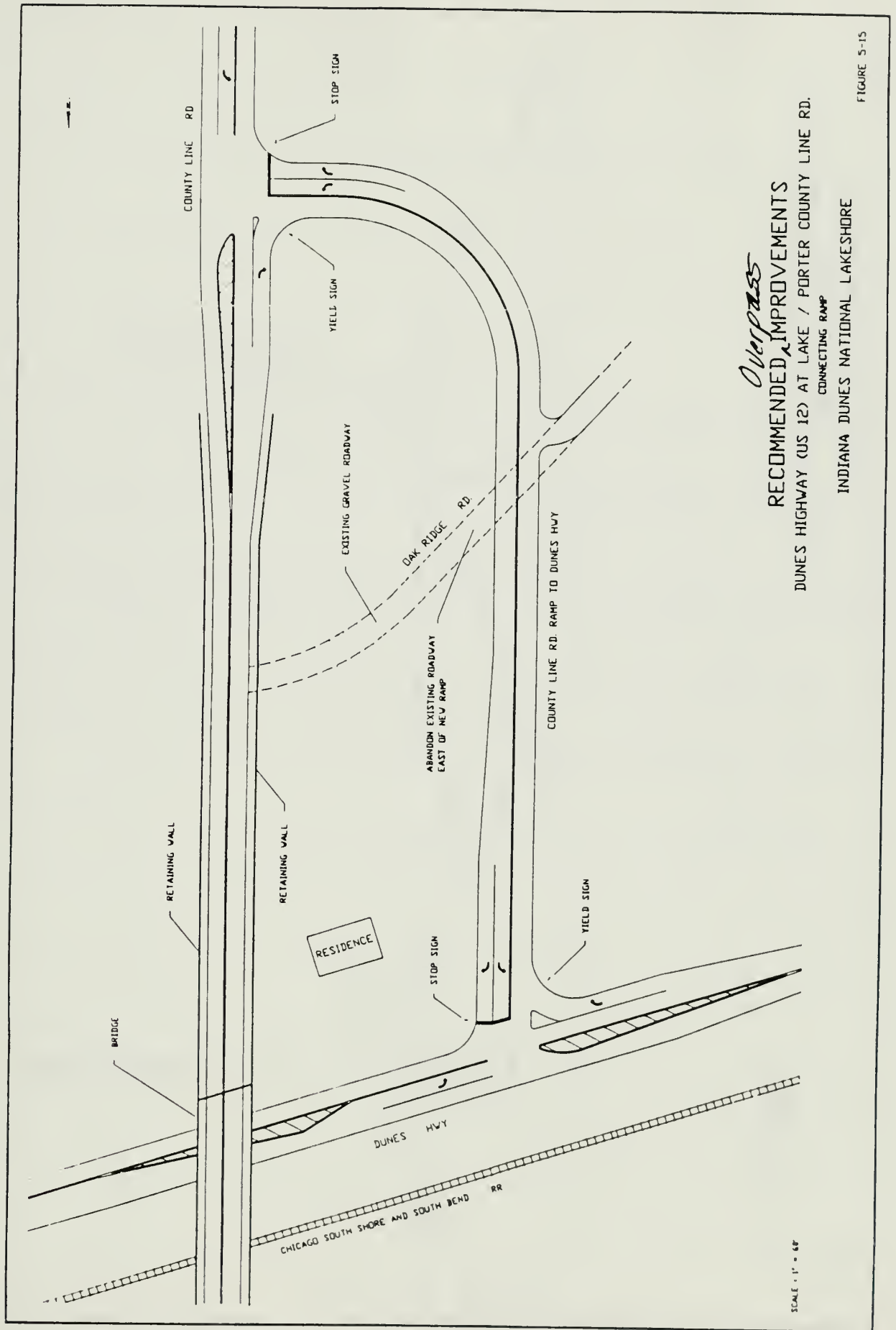
INTERIM
 RECOMMENDED IMPROVEMENTS
 US 12 AT LAKE/PORTER COUNTY LINE RD.
 GARY, INDIANA
 INDIANA DUNES NATIONAL LAKESHORE

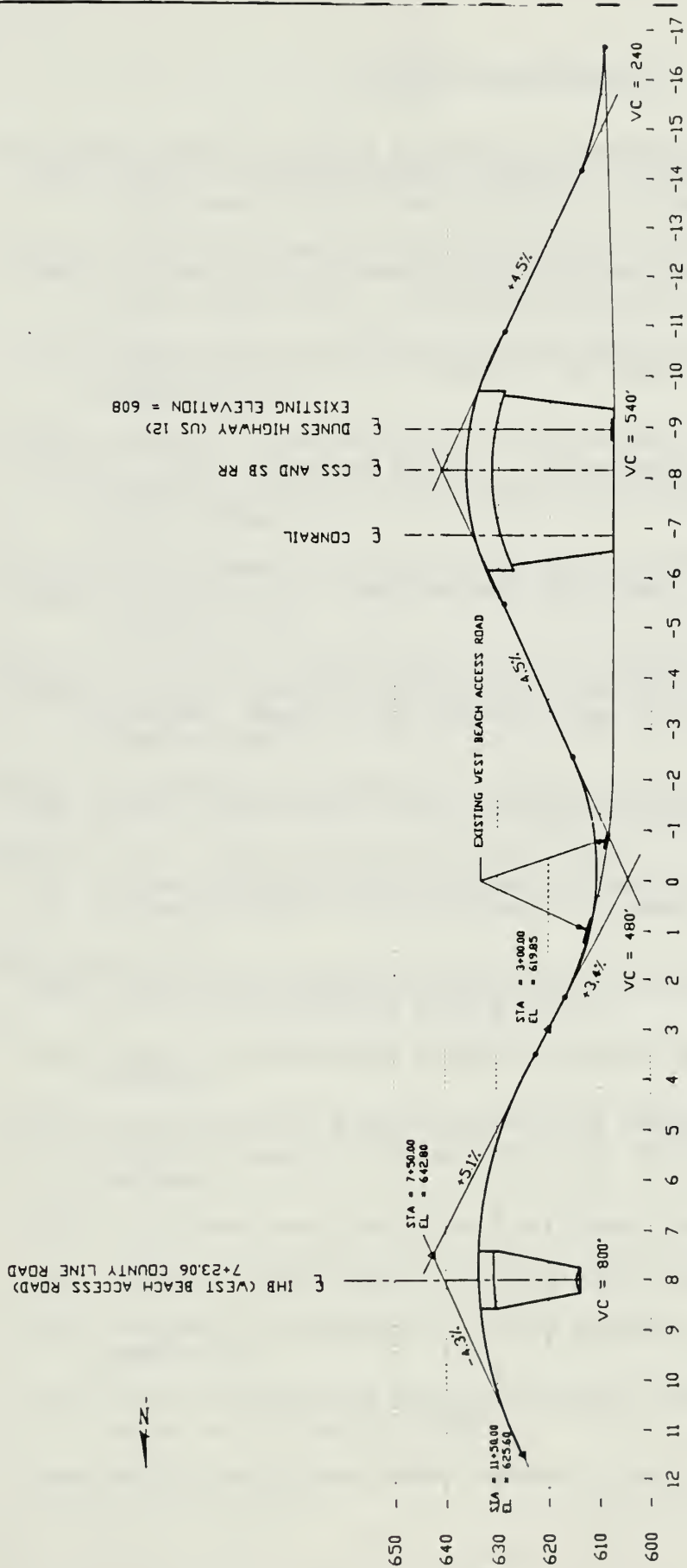
FIGURE 5-13



OVERPASS
RECOMMENDED IMPROVEMENTS
DUNES HIGHWAY (US 12) AT LAKE/PORTER COUNTY LINE RD.
GRADE SEPARATION
INDIANA DUNES NATIONAL LAKESHORE

FIGURE 5-14





SCALE: 1" = 200' HORIZONTAL
1" = 20' VERTICAL

RECOMMENDED IMPROVEMENTS DUNES HIGHWAY (US 12) AT LAKE / PORTER COUNTY LINE RD. COUNTY LINE ROAD PROFILE INDIANA DUNES NATIONAL LAKESHORE

FIGURE 5-16

SELECTED REFERENCES

- ARMENTANO, THOMAS V., ERIC S. MENGES, AND JANE MOLOFSKY
1984 "Analysis of Air-Pollution-Sensitive Vegetation at Indiana Dunes National Lakeshore" Holcomb Research Institute Paper No. 33, Butler University, Indianapolis, IN. October.
- BOWLES, MARLIN L., WILLIAM J. HESS, AND MARCELLA M. DEMAURO
1984 "An Assessment of the Monitoring Program for Special Floristic Elements at Indiana Dunes National Lakeshore Phase I. The Endangered Species" The Morton Arboretum, Lisle, IL.
1988 "An Assessment of the Monitoring Program for Special Floristic Elements at Indiana Dunes National Lakeshore Phase II. Threatened and Special Concern Species" The Morton Arboretum, Lisle, IL.
- CHILMAN, KENNETH C., DAVID FOSTER, AND ALAN EVERSON
1988 "A 'Quality' Rationale and Process for Recreational Capacity Determination." Paper presented at symposium on "Social Science and Resource Management." University of Illinois, Champaign, IL.
- CITY OF GARY, INDIANA, AND NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR
1989 *Draft Environmental Impact Statement, Gary Marina*. Department of Planning and Development. April.
- COLE, K.L., R. FUTYMA, D. ENGSTROM, AND R. STOTTLEMYER
1989 *Atmospheric Deposition of Metals in Northern Indiana, Measured Using a Peat Core from Cowles Bog*. Science Division Research Report. On file at Indiana Dunes National Lakeshore, Porter, IN.
- CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY, DEPARTMENT OF DEFENSE
1988 *Phase I: Revised Report on Great Lakes Open-Coast Flood Levels*. Detroit, MI. April.
- GRAEFE, ALAN R., FRED R. KUSS, AND JERRY J. VASKE
1987 "Recreation Impacts and Carrying Capacity: A Visitor Impact Management Framework." Prepared for National Parks and Conservation Association, Washington, DC.
- HULTSMAN, WENDY
1986a "Visitor Use and Evaluation of Impact Mitigation at Indiana Dunes National Lakeshore." November. Purdue University, West Lafayette, IN.
1986b "Fragile Dune Environments: Managing for Human Impact." Purdue University, West Lafayette, IN.
- NATIONAL PARK SERVICE, U.S. DEPARTMENT OF THE INTERIOR
1987a *Resource Management Plan and Environmental Assessment, Indiana Dunes National Lakeshore*.
1987b *Resource Management Plan, Indiana Dunes National Lakeshore*.
1978 "Preliminary Information Base, Indiana Dunes National Lakeshore." October.
1979 *Assessment of Alternatives for the General Management Plan, Indiana Dunes National Lakeshore*. July.
1980 *General Management Plan, Indiana Dunes National Lakeshore, Indiana*. On file at Denver Service Center, Denver, CO. February.
1984a *Trail Plan, Indiana Dunes National Lakeshore, Indiana*. On file at Denver Service Center, Denver, CO. April.

- 1988a *Statement For Management, Indiana Dunes National Lakeshore*. On file at Denver Service Center, Denver, CO. April.
- 1988b "Air Quality in the National Parks." Natural Resources Program Natural Resources Report 88-1. NPS Contract No. CX-0001-4-0054. Air Quality Division, Denver, CO. July.
- 1989a *Transportation Study*. Contract No. CX-20-00-9-0022. Traffic Engineers, Inc. Houston, Texas. Denver Service Center, Denver, CO. December.
- 1989b "Water Quality Report." Office of Resource Management, Indiana Dunes National Lakeshore, Porter, IN.
- ENGEL, J. RONALD
- 1983 *Scared Sands: The Struggle for Community in the Indiana Dunes*. Middletown, CT: Wesleyan University Press.
- U.S. ENVIRONMENTAL PROTECTION AGENCY
- 1986 *Solving the Hazardous Waste Problem*. EPA's RCRA Program. EPA/530-SW-86-037. Office of Solid Waste. Washington, DC. November.
- FEDERAL HIGHWAY ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION
- 1989 "Preliminary Final Environmental Impact Statement, East Unit Access Road and US 12 Relocation, La Porte County, Porter County, City of Michigan City, Indiana." Report No. FHWA-IND-EIS-87-02-F, Project No. ID-94-2(62), and NPS-M-H829(2). August.
- FISH AND WILDLIFE SERVICE, U.S. DEPARTMENT OF THE INTERIOR
- 1985 *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. September. Office of Biological Services, Washington, DC.
- PURDUE UNIVERSITY
- 1986 *Executive Summary: Shoreline Situation Report Indiana Dunes National Lakeshore*. School of Civil Engineering, Great Lakes Coastal Research Laboratory. West Lafayette, IN. June.
- 1988 *Coastal Situation Report for the State of Indiana*. Great Lakes Coastal Research Laboratory, West Lafayette, IN. June.
- SHELBY, BO, AND THOMAS A. HEBERLEIN
- 1986 *Carrying Capacity in Recreation Settings*. Corvallis, OR: Oregon State University Press.
- SOIL CONSERVATION SERVICE, U.S. DEPARTMENT OF AGRICULTURE
- 1972 *Soil Survey of Lake County, Indiana*. Washington, DC: Government Printing Office. July.
- 1981 *Soil Survey of Porter County, Indiana*. Washington, DC: Government Printing Office. February.
- STANKEY, GEORGE H., DAVID N. COLE, ROBERT C. LUCAS, MARGARET E. PETERSON, AND SIDNEY S. FRISSEL
- 1985 *The Limits of Acceptable Change (LAC) System for Wilderness Planning*. U.S. Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT.
- URBAN RESEARCH DEVELOPMENT CORPORATION
- 1977 *Guidelines for Understanding and Determining Optimum Recreation Carrying Capacity*. Prepared for Bureau of Outdoor Recreation, U.S. Department of the Interior. Bethlehem, PA.

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

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