



APPENDIX A

Supporting Analysis

Table of Contents

A1. Location _____	A-1
A2. Demographics _____	A-3
A3. General History of the Park _____	A-5
A4. Existing Land Use, Zoning and Future Uses _____	A-7
A5. Natural Features Assessment _____	A-11
A6. Cultural and Historic Resources _____	A-30
A7. Education and Interpretation _____	A-31
A8. Recreational Resources _____	A-32
A9. Park Use and Economic Impact _____	A-40

A1. Location

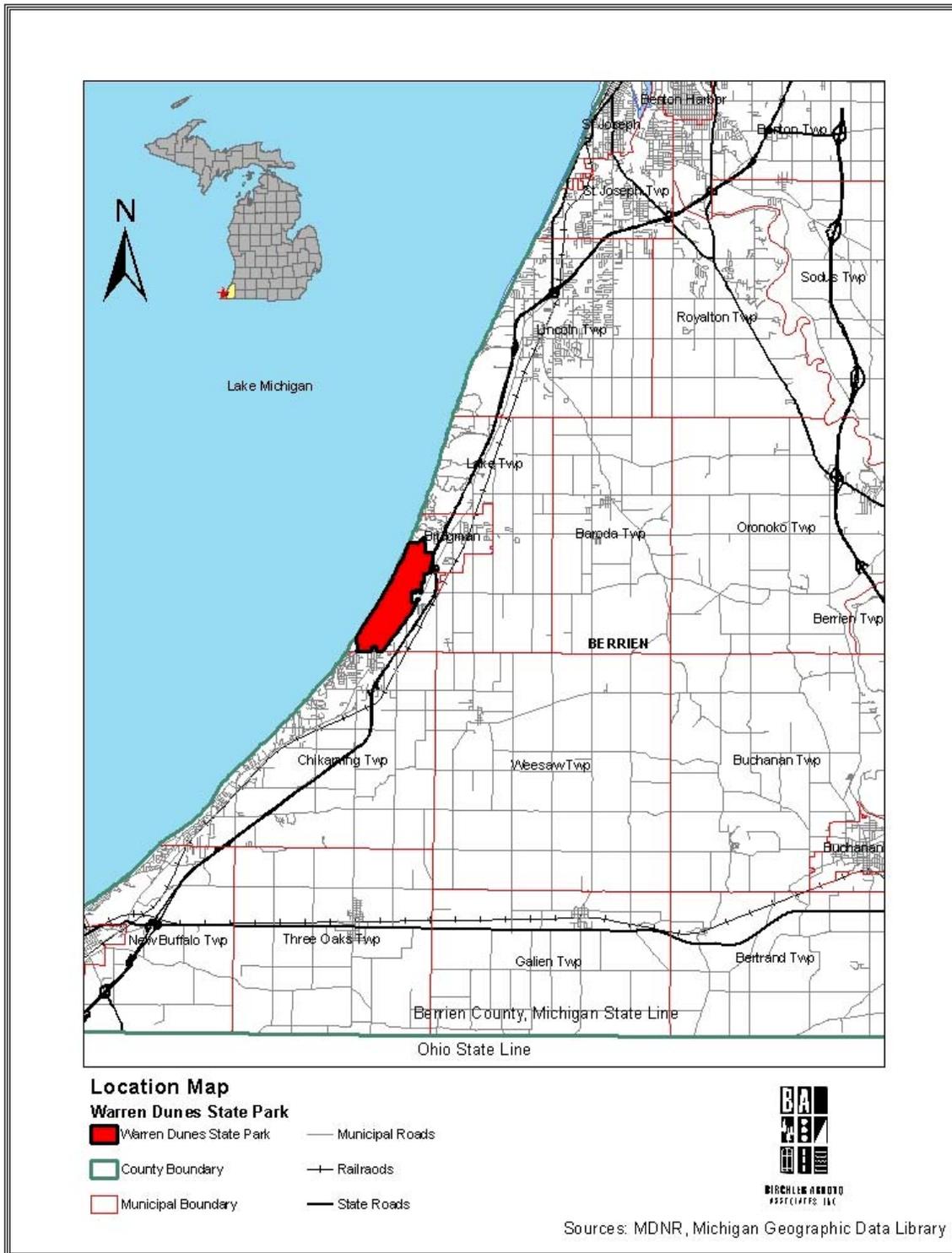
Location

Warren Dunes State Park (WDSP) is a 1,439-acre state park, located along the shore of Lake Michigan in southern Berrien County. The park has 2.5 miles of shoreline, six miles of hiking trails and is open year-round. The park's sand beaches make it one of the most popular of Michigan's state parks, with an average of over one million visitors annually. Large sand dunes are found throughout the park, offering spectacular views and excellent locations for hang gliding.

The park is located 2.5 miles south of the city of Bridgman on the west side of Red Arrow Highway. The Red Arrow Highway confines the State Park on the east. Browntown Road defines most of the southern portion of Warren Dunes State Park. Lake Michigan borders the west and Wilson Lane helps to define about half of the northern boundary. Warren Dunes State Park can be accessed easily coming from the north and south by I-94. There are two easy exits to get to Warren Dunes from I-94.

Warren Dunes is approximately 18 miles south of Benton Harbor, 66 miles west of Kalamazoo and 82 miles east of Chicago, IL. It is about 200 miles west of Detroit.

Map 1: Location



A2. Demographics

Population

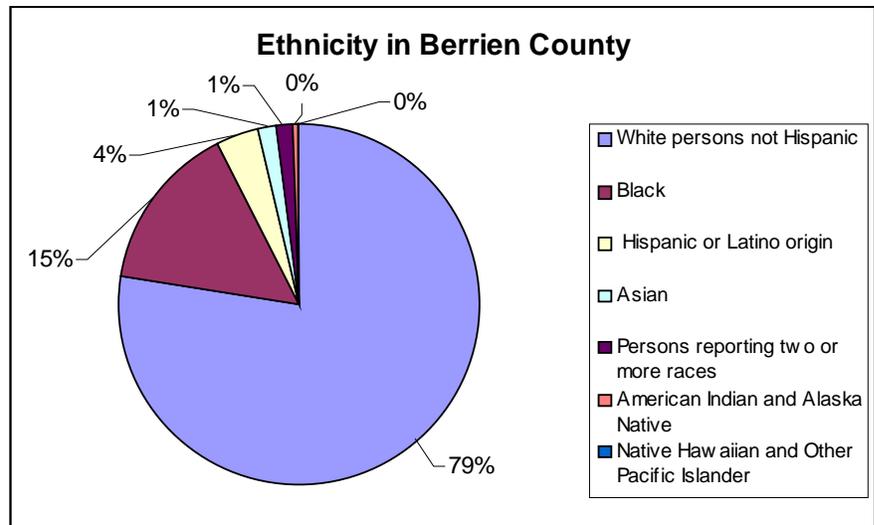
The 2006 US Census population estimate for Berrien County is 161,705. In the last five years, Berrien County lost approximately 0.5% of its population, compared with a 1.6% gain in the state of Michigan's population. Projections by Berrien County suggest the county's population could grow to 167,284 by 2020, a 3.3% increase. The population is largely comprised of White, non-Hispanics (77.9%), followed by Blacks (15.1%) and those of Hispanic or Latino origin (3.9%).

Warren Dunes State Park is located in Lake Township, which had a population of 3,148. The park is immediately south of the City of Bridgman: population 2,428 (US Census Bureau - 2000).

Education, Income and Employment

Most people over the age of 25 living in Berrien County have graduated from high school; 19.6% have at least a Bachelors Degree. The median income per household is \$38,567, lower than the US median of \$41,994. In 2000, 9.3% of families in the area lived below the poverty level.

81,078 persons in Berrien County are in the labor force. The unemployment rate is currently 9% (Michigan Department of Labor and Economic Growth – July 2008).



Employment by Occupation

Occupation	Percent Employed
Management, professional and related occupations	29.3%
Sales and Office	24.1%
Production, transportation and material moving occupations	21.3%
Service	15.3%

The manufacturing industry and educational, health and social services make up most of the Berrien County employment, followed by the retail trade and arts, entertainment, recreation, accommodation and food services.

Employment by Industry

Industry	Percent Employed
Manufacturing	24.6%
Educational, health and social services	20.3%
Retail Trade	10.8%
Arts, entertainment, recreation, accommodation and food services	7.4
Transportation, Warehousing & Utilities	6.5%
Professional, scientific, management, administrative, and waste management services	6.4%

81.6% of Berrien County residents who commute to work drive alone. Others carpool (10.7%) or walk 2.9%. Very few take public transportation (0.6%). 3.3% work from home. The average commute time is 20 minutes.

A3

General History

Park History

In the early 1920's, inventor Edward Warren discovered a way to use turkey feathers as a stiffener for dresses and corsets, replacing the heavier and more costly whalebone. With the "featherbone" fortune, Mr. Warren and his wife began buying land that others considered worthless including acres of sandy beaches and wooded hills unsuitable for farming.

The Warren's created the Edward K. Warren Foundation and deeded several properties over to it. The Foundation then leased lakefront property at no cost to the City of New Buffalo in 1921 until it could accept the gift outright in 1924. It leased Warren Woods and Warren Dunes to the State of Michigan until the park system could receive the property in 1938. Approximately 405 acres remain held pursuant to the 1938 lease, which is valid for 99 years (through 2037). In July 1944, the Conservation Commission approved the Master Plan and report for Warren Dunes State Park. That plan served as a guideline for comprehensive development until 1966

Significant improvements were made to the park through the 1960's, resulting in the construction of one mile of entrance road, a 550 car beach parking area, a wood frame concession and change court facility, a concrete toilet building at the beach, a temporary service area building and residence complex, a small outdoor center and a group camp. A 65-site campground was built just behind "Pikes Peak," a significant dune area in the southern portion of the park. The campground was expanded to 135 campsites in 1965, and a modern toilet-shower building was added.

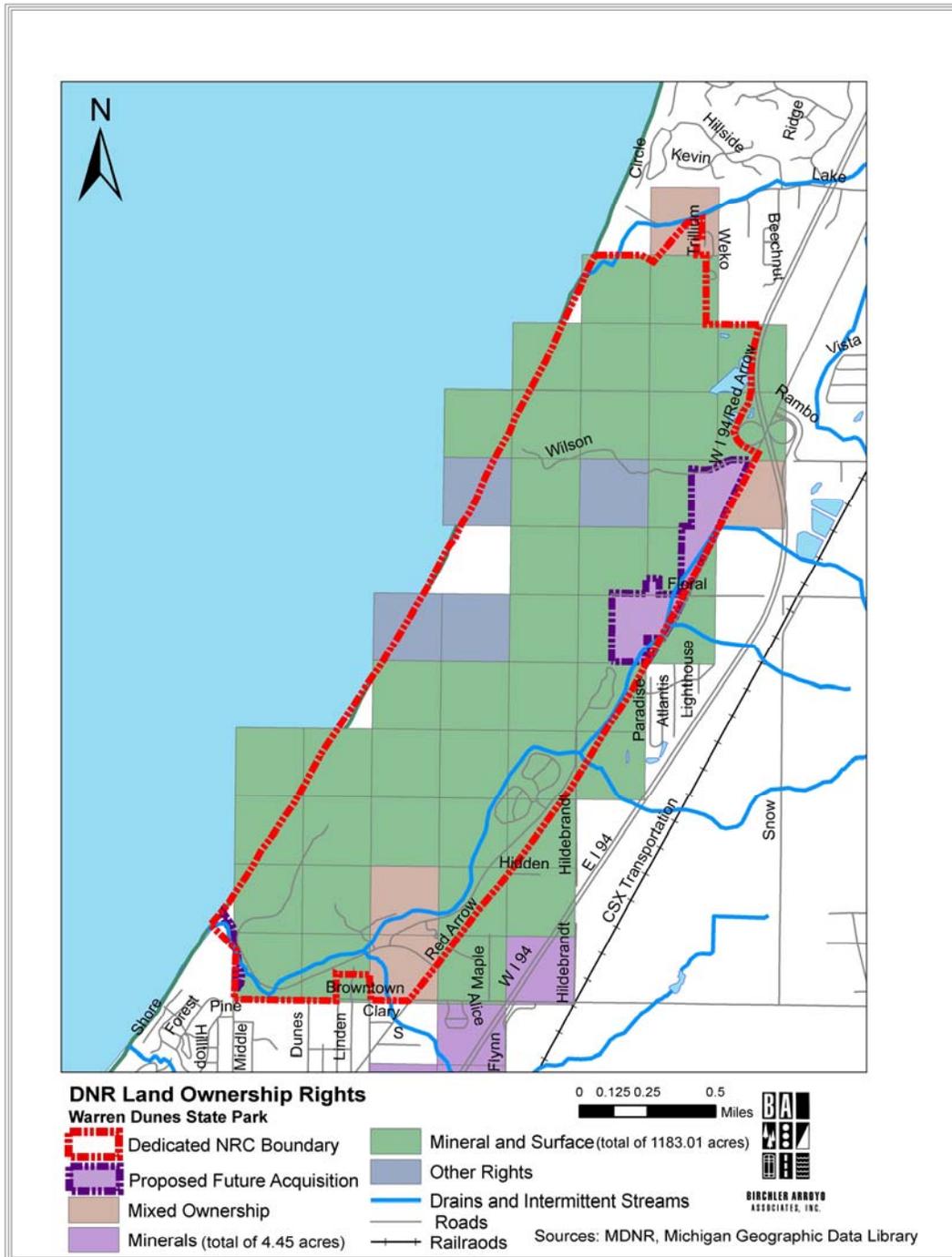
The master plan was updated in 1966. In the late 1960's-early 1970's, the capacity of the parking area expanded from 550 cars to 1,846 cars. Three new bathhouse complexes were also built, with concession stands, change courts, and toilets. Camping facilities were expanded in the backland areas of the park, and an entrance road to the new campgrounds built to connect with the main park entrance.

The park currently contains 1,439 acres, 2.5 miles of shoreline, six miles of hiking trails and is open year-round. There are 185 modern campsites, 36 rustic sites and 3 mini-cabins.

Land Ownership:

The adjacent map shows the ownership status of Warren Dunes State Park.

Map 2: Land Ownership



A4. Existing Land Use, Zoning and Future Uses

Land Use

Existing land use, zoning district and future land use data for this section is based on information obtained from Lake Township and Berrien County. The data has been generalized for the purposes of this discussion. For exact representation, consult the local unit of government. A summary of the discussion that follows is provided on Table 1, and illustrated on Maps 3, 4 and 5.

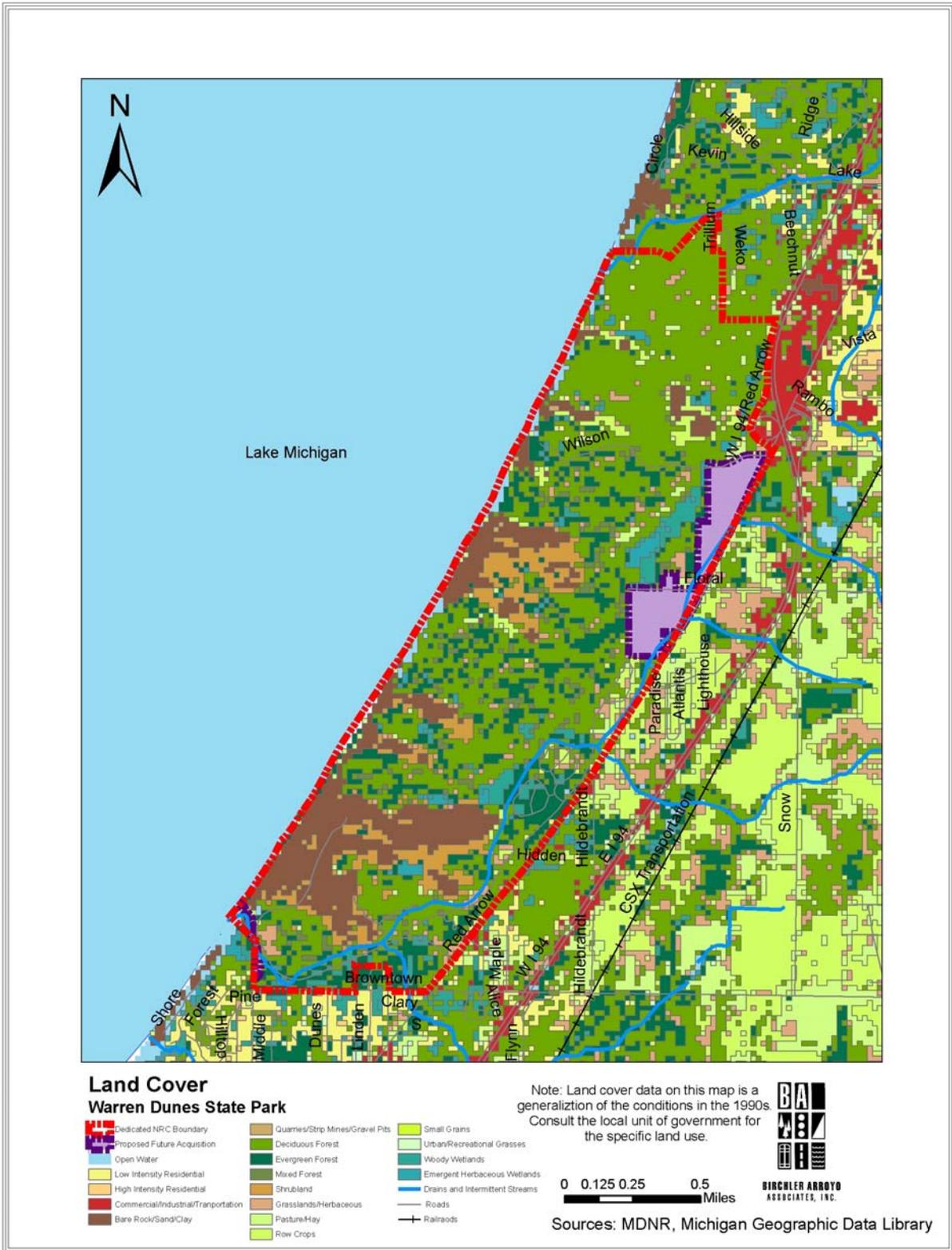
Land uses around Warren Dunes State Park consists of low-intensity development, mainly single family residential. Map 3 illustrates the existing land cover for the area. The land cover categories generally correspond to the existing land uses.

Summary of Existing Land Uses, Zoning Districts and Future Land Uses for Land Surrounding Warren Dunes State Park

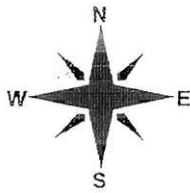
	Existing Land Uses	Zoning Districts	Future Land Uses
Warren Dunes State Park	Beaches/Sand/Forest	Recreational	Recreation
Land to the North (City of Bridgman)	Residential	Residential	Residential
Land to the South (Chikaming Twp)	Residential		Agricultural/Vacant
Land to the East (Lake Twp)	Commercial, Industrial, Residential	I-Industrial, Commercial, Limited Industrial	C-1, LI- Commercial/Industrial
Land to the West	<i>NA - Bordered by Lake Michigan to the West</i>		

Zoning districts for the area are shown on Map 4. Zoning dictates how landowners may or may not use their property. The Park and most of the surrounding land is zoned Recreational. Map 5 shows future land uses as planned by the township.

Map 3: Land Cover

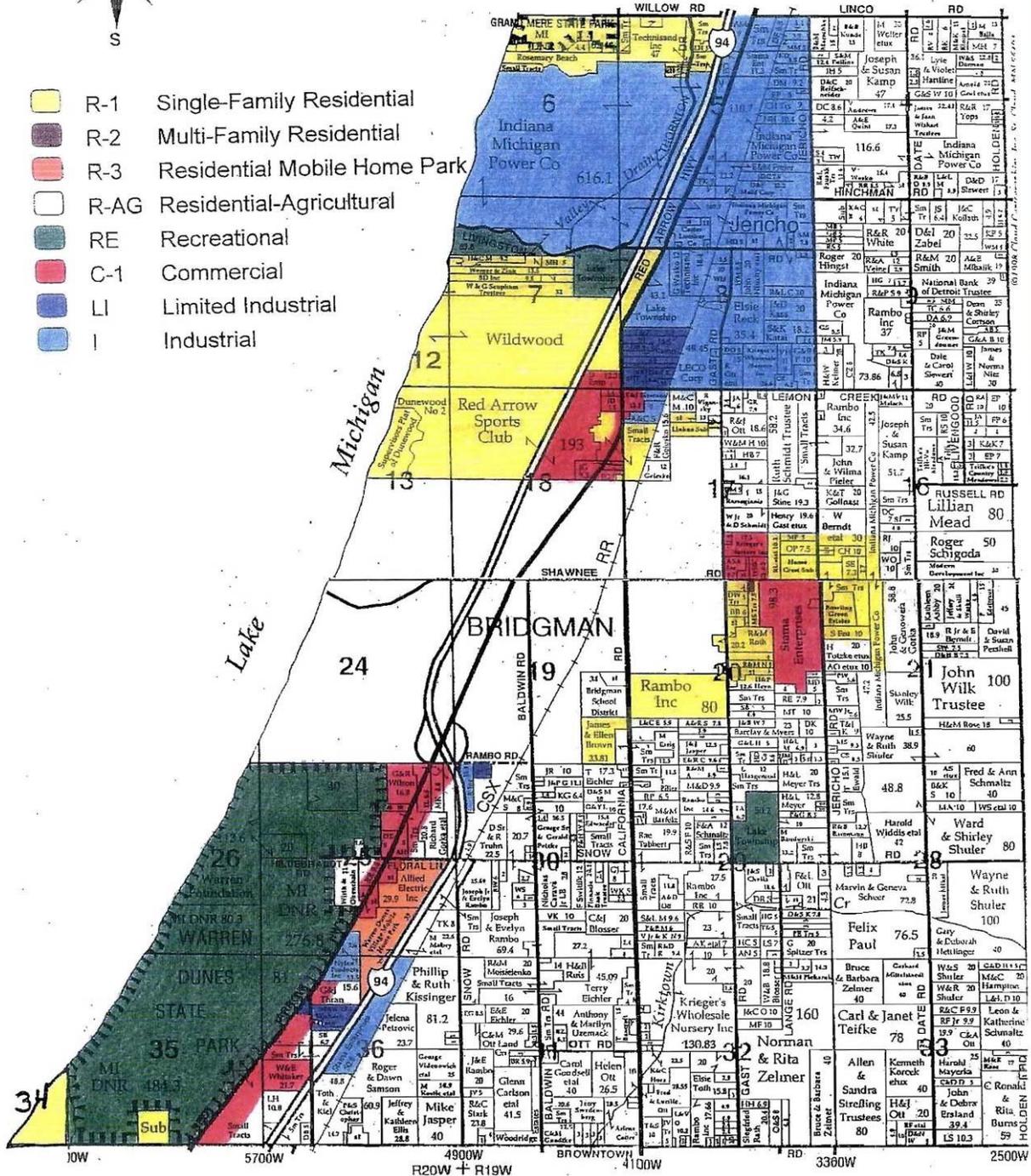


Map 4: Zoning Districts

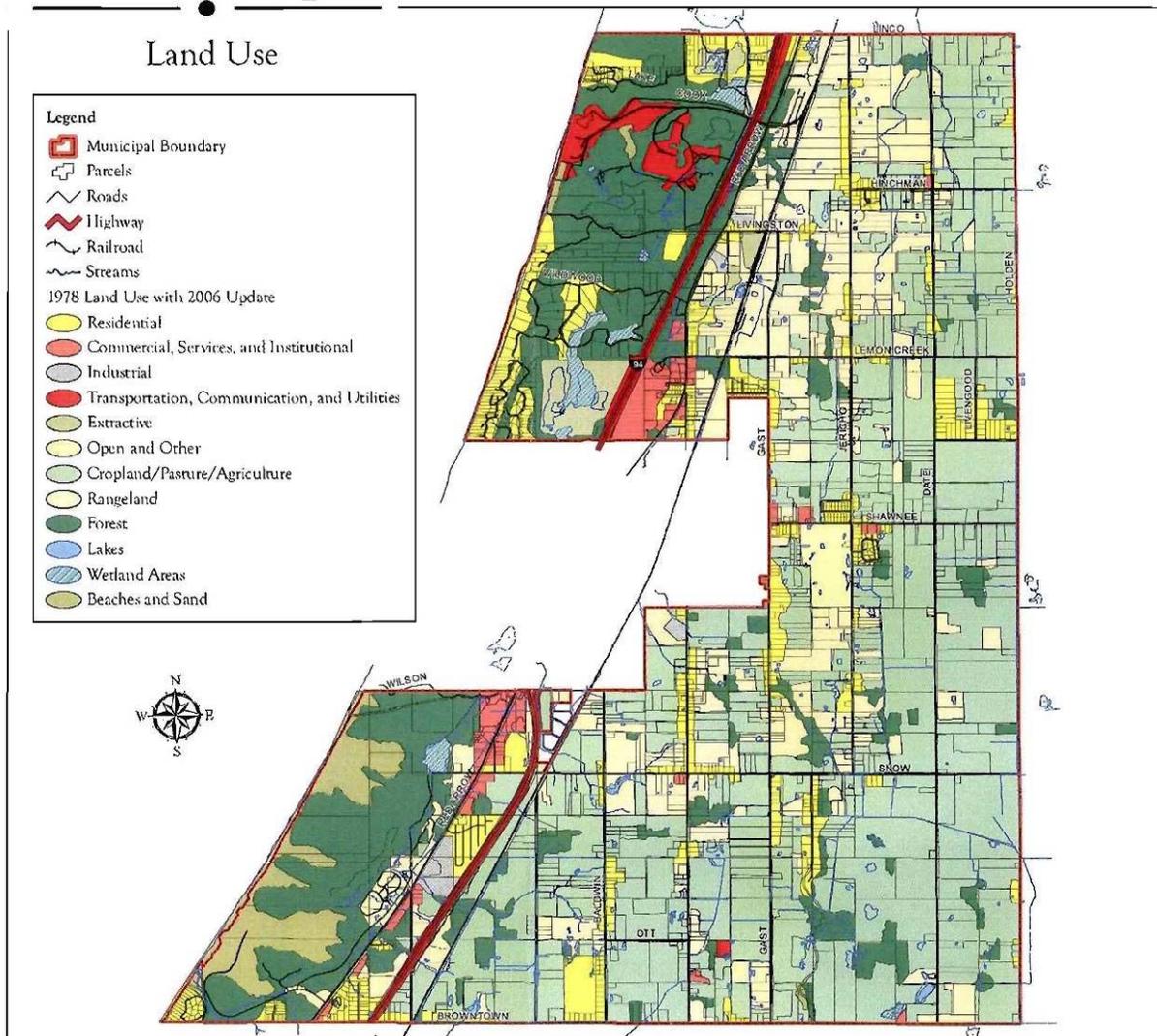


LAKE CHARTER TOWNSHIP ZONING

- R-1 Single-Family Residential
- R-2 Multi-Family Residential
- R-3 Residential Mobile Home Park
- R-AG Residential-Agricultural
- RE Recreational
- C-1 Commercial
- LI Limited Industrial
- I Industrial



Lake Charter Township



A5.

Natural Features Assessment

Natural Features

Understanding the physical conditions of Warren Dunes State Park is critical to designating management zones. Management zones must ensure that activities are compatible with the land's capacity, and that sensitive areas are preserved and protected. This section reviews the ecological context of Warren Dunes State Park, including climate, soils, water bodies, wetlands and areas prone to ponding, woodlands, and threatened and endangered species, or species of special concern.

A 5.1 Ecoregional Context

WDSP lies within the Southern Michigan section (section VI), the Allegan Subsection (Subsection VI.3), and the Southern Lake Michigan Lake Plain Sub-subsection (Sub-subsection VI.3.2) of the *Regional Landscape Ecosystems of Michigan* (Albert 1995). The Allegan subsection consists of a narrow band of dunes and flat lake plain along the southeastern Lake Michigan shoreline. The subsection encompasses 2,656 square miles with elevations ranging from 580 to 998 feet above sea level. Landforms include flat lake plain, coastal sand dunes, gently rolling till plain (ground moraine) and rolling to steep end moraines. (MNFI, MSU, June 2002)

The Lake Michigan subsection is entirely underlain by Paleozoic bedrock. Devonian shale occurs in the southern quarter. Oil wells tap petroleum reservoirs in the underlying Devonian-age marine deposits. (Dorr and Eschman 1984). Sand dunes up to 200 feet high form a 1 to 3 mile wide discontinuous band along the shore of Lake Michigan.

The major period of dune formation was during Nipissing Great Lakes time, approximately 4,500 years ago. Smaller foredunes have formed during more recent times of low water levels of Lake Michigan. Fine textured end and ground moraines exist, and most are flat to gently rolling. Low dunes are common for several miles inland and are associated with Glacial Great Lake shorelines as old as 16,000 years before present. The topography of most of the lacustrine deposits is flat to gently rolling, gradually increasing in elevation in the vicinity of the lakeshore. (MNFI, MSU, June 2002)

Water Resources

Lake Michigan is the third largest of the Great Lakes, covering a surface area of approximately 22,300 square miles. The average depth of Lake Michigan is 279 feet and the maximum depth reaches 923 feet. The water quality of Lake Michigan is excellent for such recreational activities as swimming, fishing, sailing, and boating.

In addition to Lake Michigan, Painterville Creek, a county drain, runs through this park. The creek empties into Lake Michigan at the south boundary of the park. Less than a foot deep in most spots, it is a vital part of the park's local wildlife. It is host to many forms of aquatic animals including frogs, turtles, snails, clams, and crayfish.

Climate

The climate of the section is strongly influenced by the Maritime Tropical air mass, with some lake-effect snows and moderation of temperature from Lake Michigan (Albert et al. 1986, Denton 1985, Eichenlaub 1979, Eichenlaub et al. 1990). Winter precipitation is higher (7 to 10 inches; 23 to 26 percent of annual precipitation) and more of it falls as rain than in Wisconsin's Section V to the west or Michigan's Section VII to the north. The growing season is longer and warmer than that of Sections VII to XI and similar to that of Sections I to V.

- ❑ Mean daily temperature during winter months (Dec, Jan, Feb): 29.6°F
- ❑ Mean daily temperature during spring months (Mar, Apr, May): 57.4°F
- ❑ Mean daily temperature during summer months (Jun, Jul, Aug): 68°F
- ❑ Mean daily temperature during fall months (Sept, Oct, Nov): 40.8°F
- ❑ Mean annual precipitation: 36.97 inches
- ❑ Average annual total snow fall: 78.1 inches

Source: Michigan State University

Bedrock Geology: The sub-subsection is entirely underlain by Paleozoic bedrock; Devonian shale occurs in the southern quarter; Mississippian shale, sandstone, dolomite, and gypsum occur farther to the north (Dorr and Eschman 1984, Milstein 1987). Overlying glacial drift is generally thick, from 50 to 350 feet (Akers 1938). There are very localized bedrock exposures of Coldwater shale in Ottawa County. Oil wells tap petroleum reservoirs in the underlying Devonian-age marine deposits (Dorr and Eschman 1984).

Landforms: Sand dunes, up to 200 feet high, form a 1- to 3-mile-wide discontinuous band along the shore of Lake Michigan. The major period of dune formation was during Nipissing Great Lakes time, approximately 4,500 years ago; but smaller foredunes have formed during more recent times of low-water levels of Lake Michigan (Dorr and Eschman 1984).

Fine-textured end and ground moraines were concentrated in the southern half of the sub-subsection. Most of the moraines are flat to gently rolling.

In the northern half, there were extensive sand plains. Large deltas were associated with the Glacial Grand and Muskegon Rivers. Low dunes are common several miles

inland; these dunes are associated with Glacial Great Lake shorelines as old as 16,000 years B.P. The topography of most of the lacustrine deposits is flat to gently rolling, gradually increasing in elevation from near the lakeshore.

Lakes and Streams: There are a few small kettle lakes on the sand lake plain. The water level of many of these lakes fluctuates greatly, leaving them almost dry in some summers. These fluctuations result in a distinctive disjunct flora from the Atlantic and Gulf Coastal Plains along the lake margins. There are also a few small lakes on the moraines. Several of the larger rivers, including the Black, Kalamazoo, Grand, Muskegon, and White, have sand dunes where they meet Lake Michigan, creating small lakes behind the dunes. There are often extensive marshes within these shallow lakes.

Soils: Soil textures range from sand to clay. Most surface lacustrine deposits are sand; those of the moraines are loams or clays.

Along the Muskegon River at the north edge of the sub-subsection, the lacustrine sands are generally excessively drained. A large part of these sands is outwash that contain few lenses of finetextured material to restrict drainage. Low dunes are locally common.

Poorly drained sands also characterize a large part of the northern half of the sub-subsection. Cemented B horizons are common. Finer textured subsoils are generally responsible for the poor drainage conditions. Small beach ridges and sand dunes on the poorly drained plain are excessively drained.

Soils on the upper and middle slopes of moraines are generally well or moderately well drained. On moraines, slopes of 6 to 12 percent are common. Poorly drained soils are restricted to drainage-ways and depressions in the moraines.

Presettlement Vegetation: In the southern part of the sub-subsection, forests were dominated by beech and sugar maple on both fine-textured moraines and sandy lacustrine deposits (Comer et al. 1993a). In the northern half, forests dominated by eastern hemlock and beech occupied most of the sand lake plain and fine-textured moraines.

In the south, white oak and black oak were common along the bluffs and broad ridges above major rivers, including the Galien, St. Joseph, and Paw Paw. Farther north, upland conifer forest dominated by white pine, along with white oak and some black oak, occupied the bluffs and broad ridges above the major rivers, including the Grand, Muskegon, and Kalamazoo, and also the sandy plains adjacent to White and Muskegon Lakes. Native American fire management may have maintained the white pine and oaks along the rivers.

The dunes supported forests dominated by eastern hemlock and beech. Hemlock-beech forest was the dominant forest type along the dunes of the entire shoreline as far south as Benton Harbor, near the southern edge of the sub-subsection. Although hemlock and beech were the dominant species, white pine, red oak, white oak, and sugar maple were also present. At the northern edge, white pine became increasingly

dominant on the dunes, often with hemlock or white oak as co-dominants. Several large areas of open, blowing sand (blowouts) were noted in GLO surveys. These areas, generally less than a half mile wide, extended as much as a mile inland from the shoreline.

The largest wetlands were located along the rivers, where both extensive marshes and lowland hardwoods, often dominated by either black ash or silver maple, formed broad bands for several miles inland from Lake Michigan. Both tamarack swamp and lowland hardwoods swamp were located in bowl-shaped depressions behind the dunes.

Further inland, small kettle depressions within areas of end moraine supported small marshes and both lowland hardwoods and lowland conifers. Broad depressions on both the flat sand lake plain and the ground moraine contained emergent marshes, wet prairies, and both lowland hardwoods and lowland conifers.

Natural Disturbance: The GLO survey found several blowouts in dunes. Although not noted by the surveyors, seasonal water level fluctuations occur on the lake plain, often resulting in dominance by either prairie or marsh species tolerant of such fluctuations. Such fluctuations can result in major cyclical changes in plant composition in shallow ponds or depressions as water levels change over a period of several years.

Native American land management with fire may have had a major impact on the vegetation in portions of the sub-subsection. There were local references by surveyors to burned lands along the Galien River and to Indian fields and trails along the Kalamazoo, Grand, and Muskegon Rivers.

Present Vegetation and Land Use: In the past, white pine and hemlock were harvested on the sand lake plain. Sand was mined on some of the dunes, primarily for use as molding and foundry sand. Most of the lands of the sub-subsection are in agriculture. Farming of the sand lake plain required large-scale drainage. Poorly drained portions of the lake plain now support nurseries and blueberry and asparagus farming. Better drained soils are converted to orchards and vineyards.

Some of the driest and most poorly drained sandy soils remain as wildlife management areas or as recreational lands, either forested or wetland. Large portions of the coastal sand dunes are protected as park lands, but there is also heavy residential development of sections of the dunes.

Rare Plant Communities: The wet prairies of the sub-subsection are distinct from those found in other parts of the State and are called lakeplain wet and wet-mesic prairies. Many of the marshes, which occupy shallow depressions between beach ridges or sand spits (often several miles inland from the present lakeshore), are rich in disjunct species from the Atlantic and Gulf Coastal Plains of the U.S.

Rare Plants: Most of the rare plants are coastal plain disjuncts from the Atlantic and Gulf coasts; there are also species characteristic of the sand dunes of the Great Lakes. *Carex platyphylla* (broad-leaved sedge), *Cirsium pitcheri* (Pitcher's thistle), *Echinodorus*

tenellus (dwarf burhead), Eleocharis melanocarpa (black-fruited spike-rush), Eleocharis tricostata (three-ribbed spike-rush), Hibiscus moscheutos (swamp rose-mallow), Juncus biflorus (two-flowered rush), Juncus scirpoides (scirpus-like rush), Lycopodium appressum (appressed bog clubmoss), Orobanche fasciculata (fascicled broom-rape), Panicum longifolium (long-leaved panic-grass), Potamogeton bicupulatus (waterthread pondweed), Pycnanthemum verticillatum (whorled mountain-mint), Rhexia mariana var. mariana (Maryland meadow-beauty), Rhexia virginica (meadow-beauty), Sabatia angularis (rose-pink), Scirpus hallii (Hall's bulrush), Scleria reticularis (netted nut-rush), Sisyrrinchium atlanticum (Atlantic blue-eyed grass), Utricularia subulata (zigzag bladderwort).

Rare Animals: Chlidonias niger (black tern), Clonophis kirtlandii (Kirtland's snake), Dendroica cerulea (cerulean warbler), Dendroica discolor (prairie warbler), Dendroica dominica (yellow-throated warbler), Hesperia ottoe (Ottoe skipper), Incisalia irus (frosted elfin), Lanius ludovicianus (loggerhead shrike), Lycaeides melissa samuelis (Karner blue), Microtus ochrogaster (prairie vole).

Map 6: Ecoregional Context

Section VI.1 Washtenaw

VI.1.1. Maumee Lake Plain

VI.1.2. Ann Arbor Moraines

VI.1.3. Jackson Interlobate

Section VI.2 Kalamazoo

Interlobate

VI.2.1. Battle Creek Outwash

Plain

VI.2.2. Cassopolis Ice-

Contact Ridges

Section VI.3 Allegan

VI.3.1. Berrien Springs

VI.3.2. Southern Lake

Michigan Lake Plain

VI.3.3. Jamestown

Section VI.4 Ionia

VI.4.1. Lansing

VI.4.2. Greenville

Section VI.5 Huron

VI.5.1. Sandusky Lake Plain

VI.5.2. Lum Interlobate

Section VI.6 Saginaw Bay

Lake Plain

Section VII.1 Arenac

VII.1.1. Standish

VII.1.2. Wiggins Lake

Section VII.2 High Plains

VII.2.1. Cadillac

VII.2.2. Grayling

Outwash Plain

VII.2.3. Vanderbilt

Moraines

Section VII.3 Newaygo

Outwash Plain

VII.4. Manistee

VII.5. Leelanau and

Grand Traverse

Peninsula

VII.5.1. Williamsburg

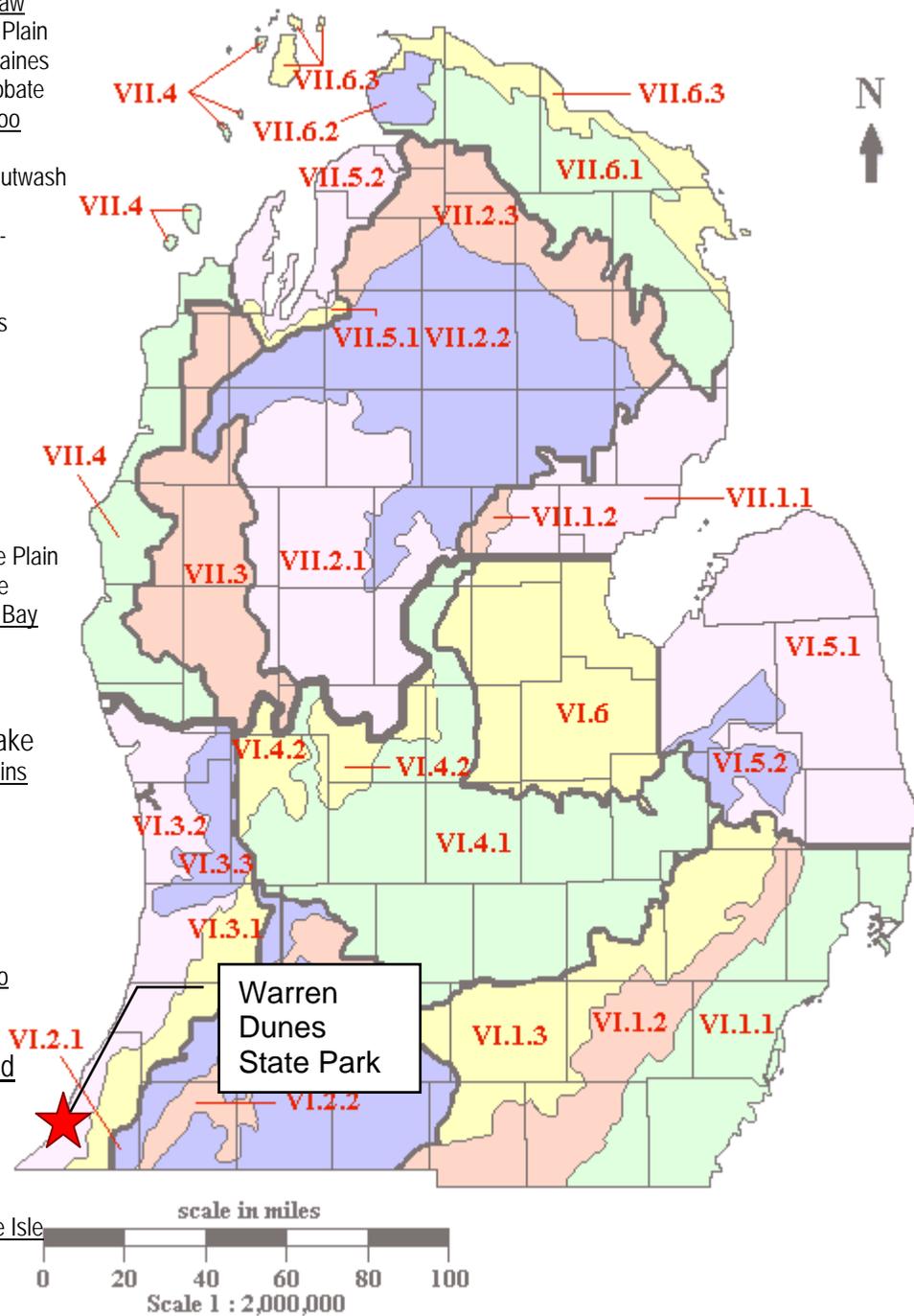
VII.5.2. Traverse City

Section VII.6 Presque Isle

VII.6.1. Onaway

VII.6.2. Stutsmanville

VII.6.3. Cheboygan



Source: *Regional Landscape of Ecosystems of Michigan, Minnesota, and Wisconsin: A Working Map and Classification General Technical Report NC-178 (Fourth Revision: July 1994).*

Flora - The following information was obtained from an MNFI report, MSU, June 2002.

Warren Dunes State Park currently supports an extensive network of forested dunes and several large areas of open dune. In addition, a hardwood swamp, shrub swamp and emergent marsh all occur behind the forested dunes along the eastern edge of the park. The forested dunes are of high quality, especially in the northern portions of the park where they have probably experienced only selective logging in the past. Based on its present appearance and species composition, a portion of the dune forest may have been more open in the past. Today these same areas support close canopy, oak-dominated forests.

The forested dunes are comprised of three different forest types: mesic southern forest, mesic northern forest, and dry-mesic southern forest, which integrate throughout the park. Both the mesic southern forest and mesic northern forest qualify as natural community occurrences because of their exemplary condition and overall large size of the forested block within which they occur.

The most extensive type of forest within the park is mesic southern forest. The community is consistently of high ecological integrity with a diverse canopy, understory and ground layer. An area north of Mt. Edward that was referred to by Thompson (1988) as "virgin hardwood forest" was observed to have several attributes of old-growth forest, including trees of large diameter and stature and standing snags and downed woody debris in a variety of diameter classes and stages of decomposition. Canopy dominants in the mesic southern forest include sugar maple, beech, tulip poplar, chinquapin oak, red oak, basswood, and bitternut hickory. Understory species include pawpaw, spice bush, witch hazel, ironwood, sassafras, and maple-leaved arrow-wood. Ground flora species include wild sarsaparilla, rattlesnake fern, bottlebrush grass, and bellwort.

The portions of dune forest characterized as mesic northern forest are similar in species composition to the mesic southern forest, but also support populations of conifers such as hemlock, white pine and Canada yew. Mesic northern forest occurs along the north facing slopes near the lakeshore and in ravine channels and depressions between high dune ridges.

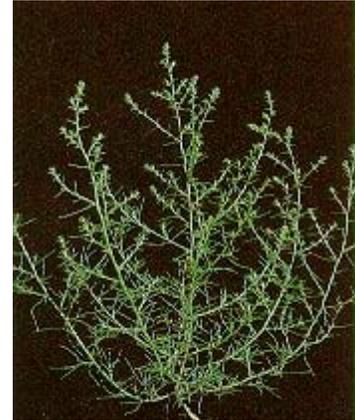
Small patches of dry-mesic forest occur throughout the park. These areas are dominated by black oak, with white oak, red oak, and sassafras also common in the canopy. Many of the oaks, especially those along the ridge tops, appeared to be open grown, suggesting that the area once supported a fire-dependent oak barrens or oak savanna community.

Due to an infestation of the Emerald Ash Borer beetle, over 4,000 ash trees have been removed from the modern campground unit. This action was necessary to help halt the spread of the Emerald Ash Borer and has resulted in a dramatic change to the area landscape and the appearance of modern campsites.

Ground flora species observed here that also suggest a more open community structure in the past include sweet low blueberry, columbine and sedge. Several invasive

species occur, including garlic mustard, Japanese barberry, common privet, and multiflora rose. These invasive species threaten to significantly erode plant species richness at the park.

Open dune communities occur along the Lake Michigan coastline throughout the park. Common dune species include little bluestem, sand reed grass, hairy puccoon, flowering spurge, sand cherry, bearberry, wormwood, and hop tree. The open dunes in the southern portion of the park have been degraded by excessive foot traffic with the most severely degraded dune occurring adjacent to the large parking area. Conversely, the open dunes in the northern portion of the park appear in good condition, except where frequent foot traffic has contributed to a loss of vegetation, resulting in severe erosion.



Russian Thistle

Interdunal wetlands occur at the base of several open dunes in the northern portion of the park. Common species recorded from the interdunal wetlands include twig-rush, rush, Canadian rush, Kalm's St. John's-wort, bog lobelia, and sedge. An exotic species, russian thistle (pictured on the right), was common along the perimeter of the wetlands.

Several rare plant species have been documented in or near Warren Dunes State Park. Climbing fumitory, listed as special concern by the state, was recorded in the vicinity in 1989. An occurrence of frost grape was recorded in 1965. The Show orchid was recorded near the park in 1952, and is listed as threatened by the state. These forest species are extremely vulnerable to degradation of the forested system by fragmentation, canopy removal, invasion of exotic species, and over-use by recreationists. Development and use of these forests within the park should be minimized.



Pitcher's Thistle

The paniced hawkweed, listed as special concern by the state, was documented in 1985. The maintenance or creation of openings with the oak forest where it was found will likely be important. The zig-zag bladderwort, which is state-listed as threatened, was collected in 1986 and 1987. The water-meal, state-listed as threatened, was found in 1995. A thriving but small population of Pitcher's thistle, which is on the federal and state list of threatened species, is found in the park.

Fauna

The rare prairie warbler can be found with upland shrub species. Most prairie warblers arrive in mid-May, and nesting activities occur in June and July. Fall migration occurs usually before the end of August. Management practices that are beneficial to the prairie warbler include: conducting prescribed burns, allowing natural succession to proceed in fields, creating large cut-over areas, maintaining large thickets in agricultural areas, and establishing pine plantations. Dune/shoreline habitats should be protected since they often provide excellent habitat for prairie warblers and apparently support viable populations in Michigan.

Four listed rare bird species occurrences have been documented at Warren Dunes State Park. Surveyors documented five male singing prairie warblers, state-listed as endangered, at two locations within the park. Breeding Bird Atlas surveys in the mid-1980's documented three bird species in or near the park that are state-listed as special concern: the Hooded Warbler, Louisiana Waterthrush, and the Dickcissel.



Hooded Warbler



Louisiana Waterthrush



Dickcissel

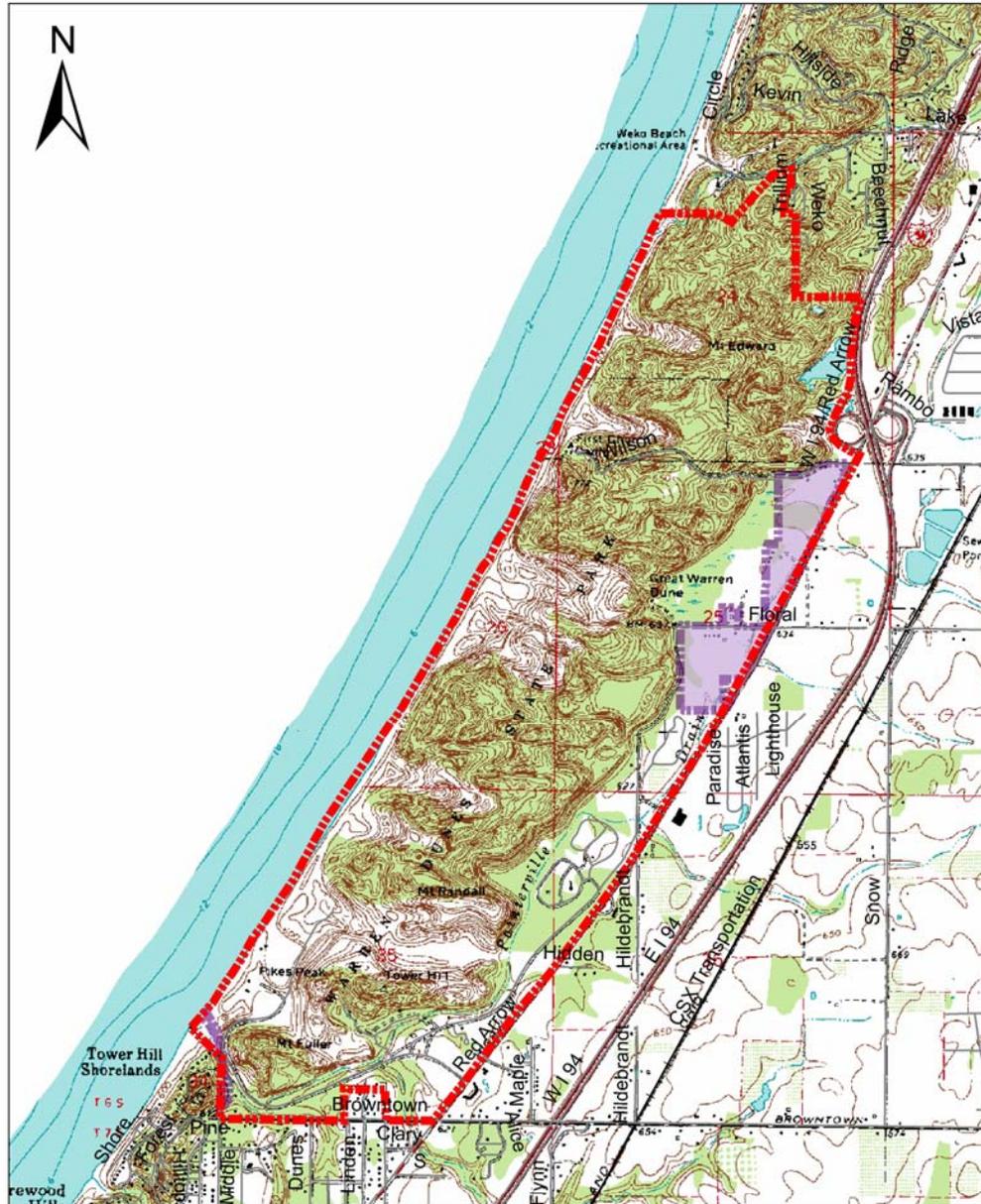
The Great Lakes shorelines have been identified as providing important habitat for migrating birds. As birds funnel and congregate along the shoreline, some will cross the open water and head to the nearest land mass. The variety of habitats within Warren Dunes State Park provides nesting habitat, shelter and fresh water for migratory bird species. This contributes to the recognition of the park as one of the best birding sites in southwest Michigan during spring migration, with over 20 species of warblers often reported from the park in May each year.

Two occurrences of the eastern box turtle, state-listed as special concern, have been documented in the parks. Loss of forested and wetland habitats is the most serious threat to this species, but many box turtles are killed on roads or collected as pets each year.

The state-listed as special concern pine tree cricket may occur in the park, and the state-listed as special concern woodland vole has potential to occur in the park; a specimen was collected in the general area in 1977.

The Painterville Creek (a county drain) flows through Warren Dunes State Park. Fish species including central stoneroller, creek chub, central mudminnow, slimy sculpin, burbot and freshwater drum can be found. These species are common and do not attract excessive fishing.

Map 7: Topography



Topography Map
Warren Dunes State Park

-  Dedicated NRC Boundary
-  Proposed Future Acquisition
-  Roads
-  Railroads

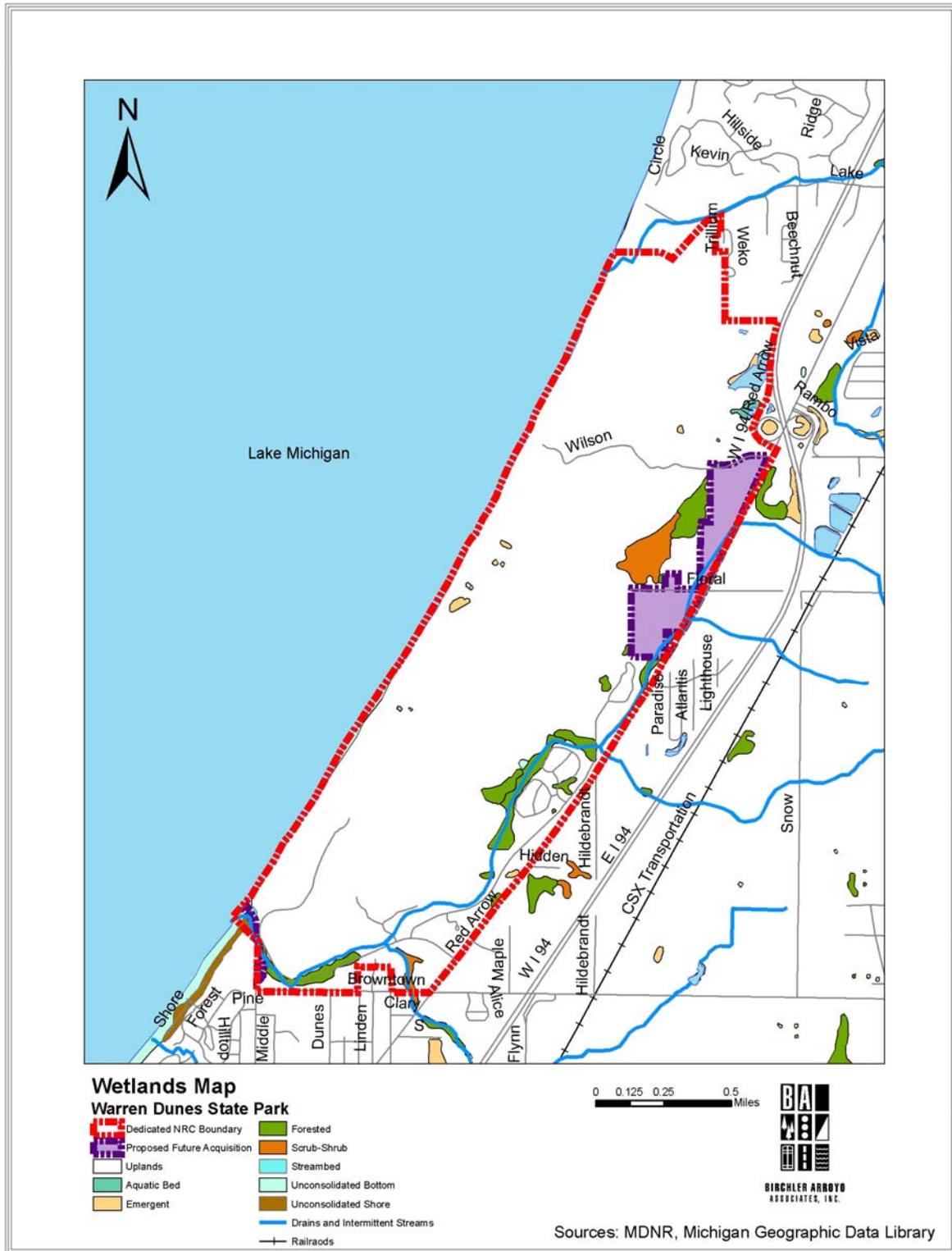
0 0.125 0.25 0.5 Miles



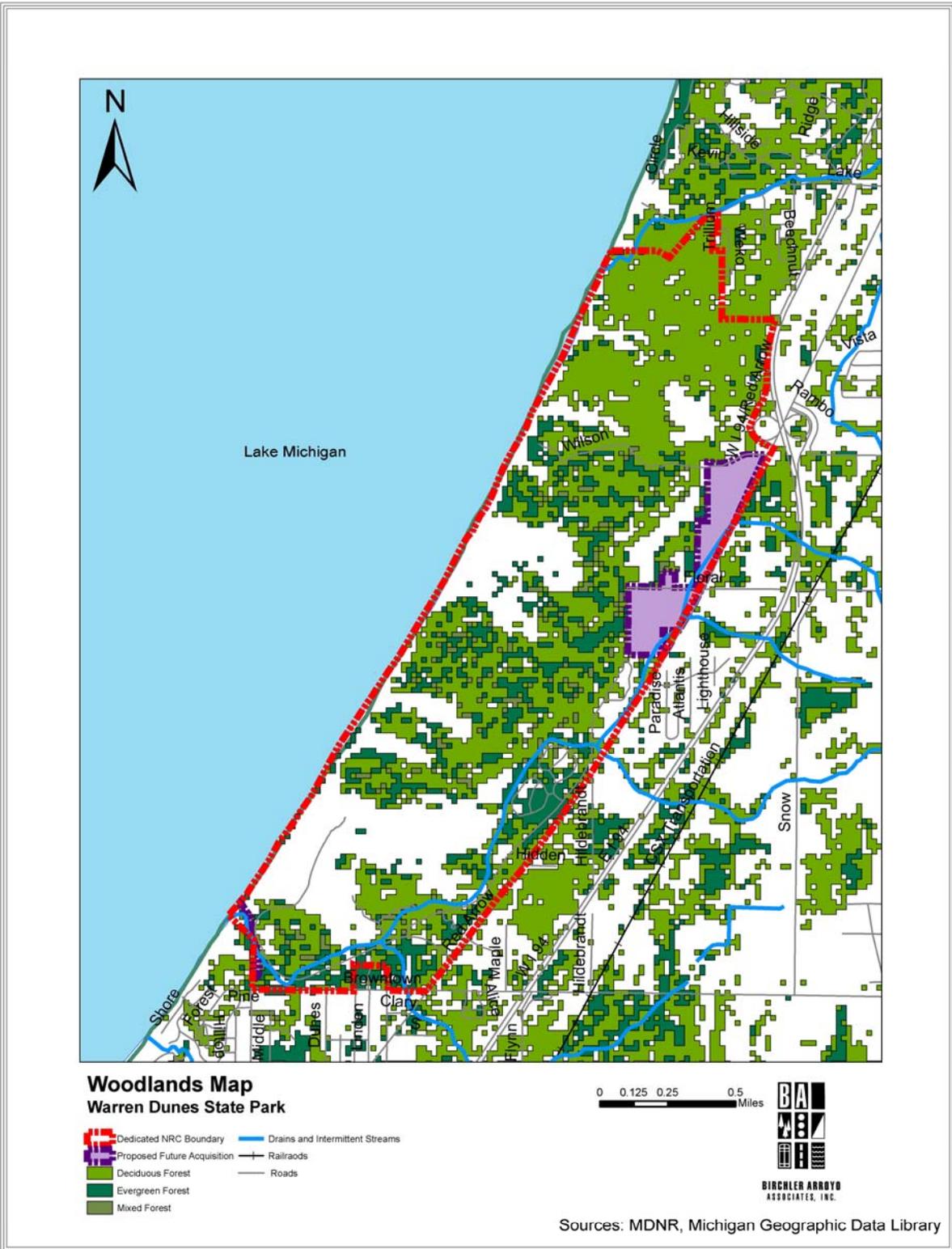
BIRCHLER ARROYO
ASSOCIATES, INC.

Sources: MDNR, Michigan Geographic Data Library

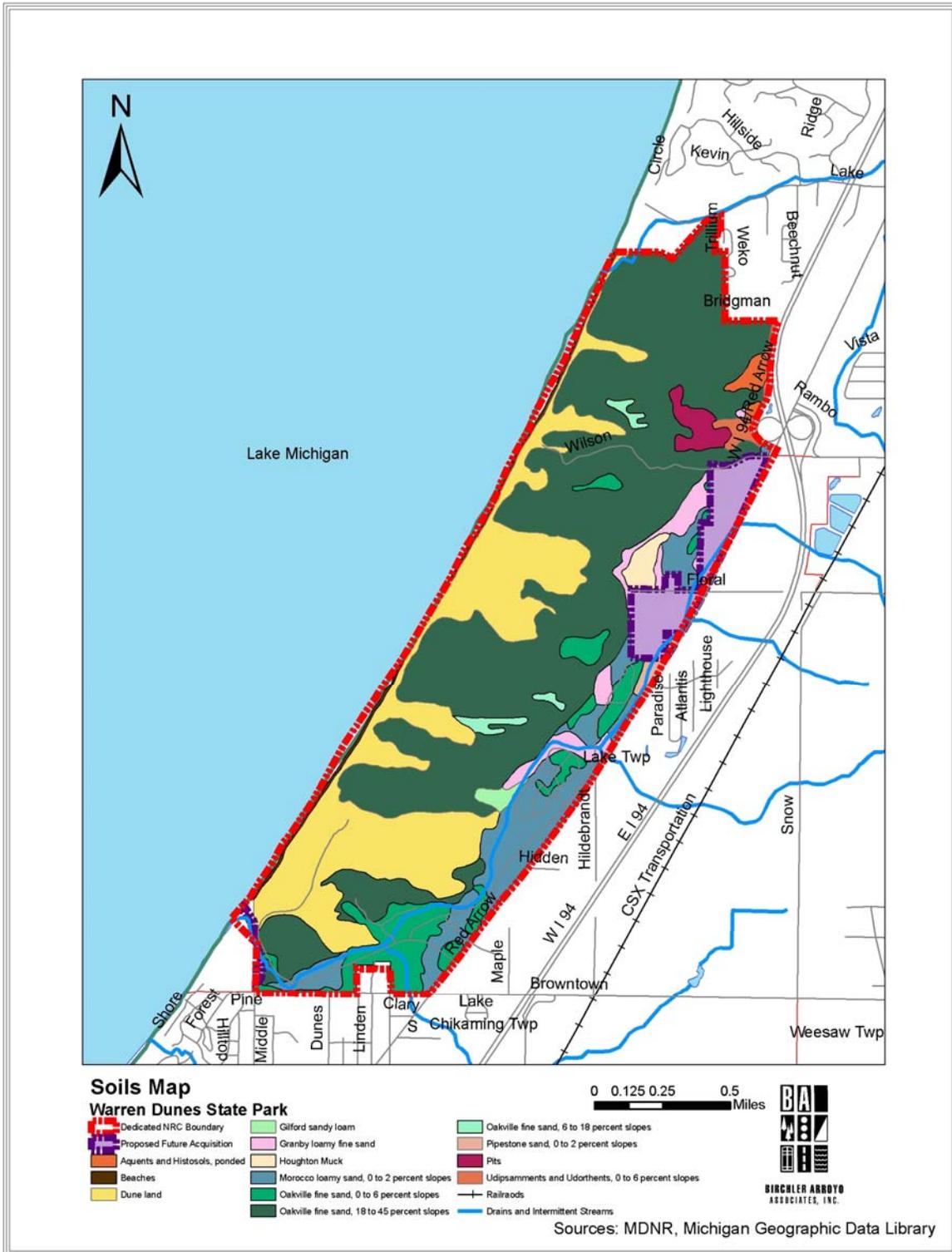
Map 8: Wetlands



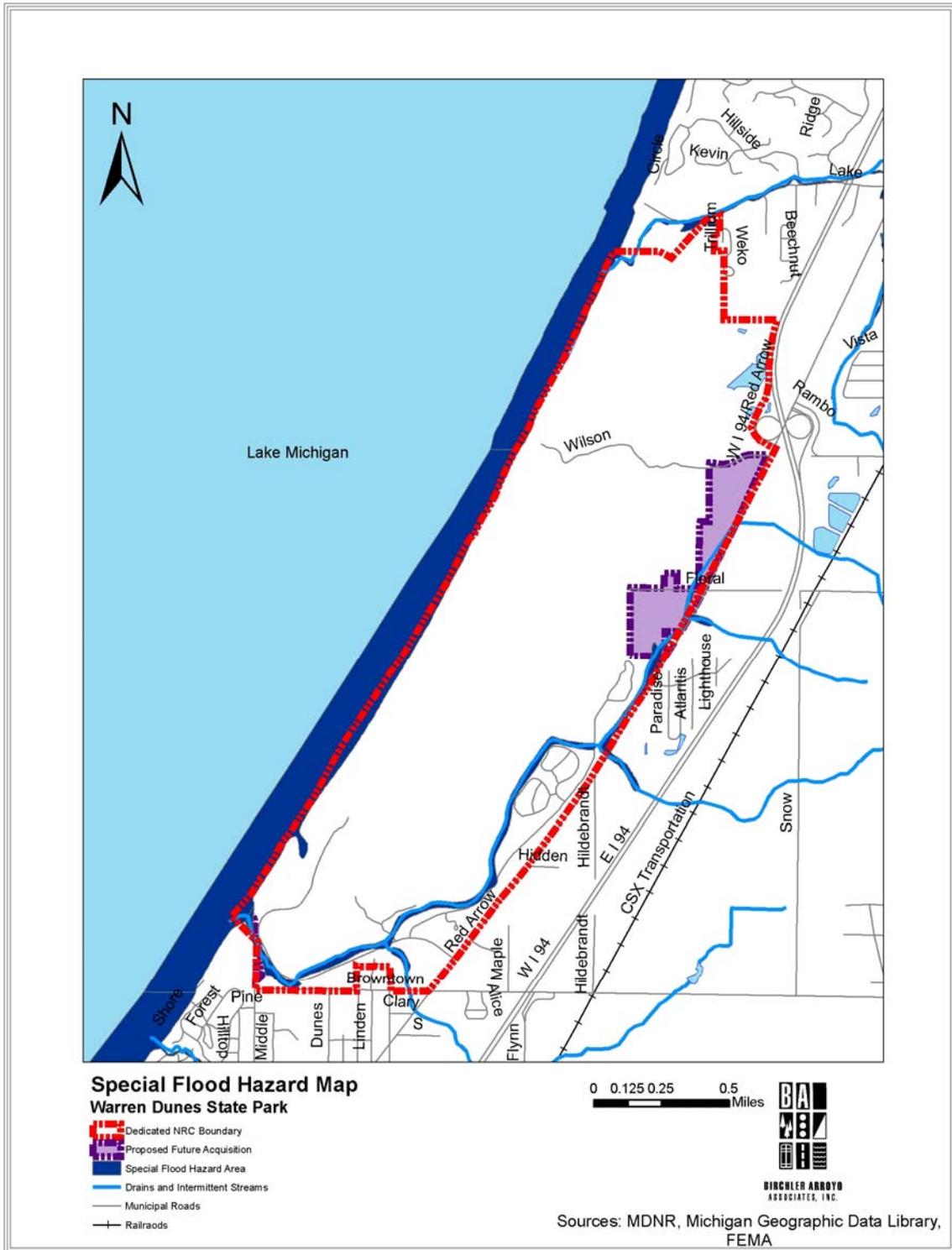
Map 9: Woodlands



Map 10: Soils



Map 11: Special Flood Hazards



A 5.2 Threatened, Endangered and Special Concern Species

The Michigan Natural Features Inventory has identified species of special concern (SC), threatened (T), endangered (E), and extirpated (X) species as protected by the State of Michigan in Berrien County. Some species have federal protection status and are noted as listed endangered (LE) or listed threatened (LT). Species identified as being considered for protected status are noted by (C).

Scientific Name	Common Name	Federal Status	State Status
<i>Acipenser fulvescens</i>	Lake Sturgeon		T
<i>Acris crepitans blanchardi</i>	Blanchard's Cricket Frog		SC
<i>Adlumia fungosa</i>	Climbing Fumitory		SC
<i>Agrimonia rostollata</i>	Beaked Agrimony		SC
<i>Alasmidonta marginata</i>	Elktoe		SC
<i>Alasmidonta viridis</i>	Slippershell Mussel		SC
<i>Ambystoma opacum</i>	Marbled Salamander		T
<i>Ammodramus henslowii</i>	Henslow's Sparrow		T
<i>Ammodramus savannarum</i>	Grasshopper Sparrow		SC
<i>Amorpha canescens</i>	Leadplant		SC
<i>Androsace occidentalis</i>	Rock-jasmine		E
<i>Arabis missouriensis</i> var. <i>deamii</i>	Missouri Rock-cress		SC
<i>Aristida longespica</i>	Three-awned Grass		T
<i>Aristida tuberculosa</i>	Beach Three-awned Grass		T
<i>Aristolochia serpentaria</i>	Virginia Snakeroot		T
<i>Asclepias purpurascens</i>	Purple Milkweed		SC
<i>Asplenium rhizophyllum</i>	Walking Fern		T
<i>Astragalus canadensis</i>	Canadian Milk-vetch		T
<i>Baptisia lactea</i>	White or Prairie False Indigo		SC
<i>Berula erecta</i>	Cut-leaved Water-parsnip		T
Bog			
<i>Buteo lineatus</i>	Red-shouldered Hawk		T
<i>Cacalia plantaginea</i>	Prairie Indian-plantain		SC
<i>Calephelis mutica</i>	Swamp Metalmark		SC
<i>Camassia scilloides</i>	Wild-hyacinth		T
<i>Carex albolutescens</i>	Greenish-white Sedge		T
<i>Carex crus-corvi</i>	Raven's-foot Sedge		T
<i>Carex davisii</i>	Davis's Sedge		SC
<i>Carex gravida</i>	Sedge		X
<i>Carex oligocarpa</i>	Eastern Few-fruited Sedge		T
<i>Carex platyphylla</i>	Broad-leaved Sedge		T
<i>Carex seorsa</i>	Sedge		T
<i>Carex squarrosa</i>	Sedge		SC
<i>Carex trichocarpa</i>	Hairy-fruited Sedge		SC
<i>Castanea dentata</i>	American Chestnut		E
<i>Charadrius melodus</i>	Piping Plover	LE	E
<i>Chasmanthium latifolium</i>	Wild-oats		T
<i>Cirsium hillii</i>	Hill's Thistle		SC
<i>Cirsium pitcheri</i>	Pitcher's Thistle	LT	T
<i>Cistothorus palustris</i>	Marsh Wren		SC
<i>Clemmys guttata</i>	Spotted Turtle		T
<i>Clonophis kirtlandii</i>	Kirtland's Snake		E

Scientific Name	Common Name	Federal Status	State Status
Coastal Plain Marsh	Infertile Pond/marsh, Great Lakes		
<i>Commelina erecta</i>	Slender Day-flower		X
<i>Coreopsis palmata</i>	Prairie Coreopsis		T
<i>Corydalis flavula</i>	Yellow Fumewort		T
<i>Cuscuta campestris</i>	Field Dodder		SC
<i>Cuscuta glomerata</i>	Rope Dodder		SC
<i>Cyclonaias tuberculata</i>	Purple Wartyback		SC
<i>Cyperus flavescens</i>	Yellow Nut-grass		SC
<i>Cypripedium candidum</i>	White Lady-slipper		T
<i>Dendroica cerulea</i>	Cerulean Warbler		SC
<i>Dendroica discolor</i>	Prairie Warbler		E
<i>Dendroica dominica</i>	Yellow-throated Warbler		T
<i>Diarrhena americana</i>	Beak Grass		T
<i>Dodecatheon meadia</i>	Shooting-star		E
<i>Draba reptans</i>	Creeping Whitlow-grass		T
Dry-mesic Southern Forest			
<i>Dryopteris celsa</i>	Log Fern		T
<i>Eleocharis engelmannii</i>	Engelmann's Spike-rush		SC
<i>Eleocharis melanocarpa</i>	Black-fruited Spike-rush		SC
<i>Emys blandingii</i>	Blanding's Turtle		SC
<i>Epioblasma triquetra</i>	Snuffbox		E
<i>Eryngium yuccifolium</i>	Rattlesnake-master		T
<i>Eupatorium fistulosum</i>	Hollow-stemmed Joe-pye-weed		T
<i>Euphorbia commutata</i>	Tinted Spurge		T
<i>Euxoa aurulenta</i>	Dune Cutworm		SC
<i>Filipendula rubra</i>	Queen-of-the-prairie		T
<i>Fimbristylis puberula</i>	Chestnut Sedge		X
Floodplain Forest			
<i>Fontigens nickliniana</i>	Watercress Snail		SC
<i>Fraxinus profunda</i>	Pumpkin Ash		T
<i>Fundulus dispar</i>	Starhead Topminnow		SC
<i>Galearis spectabilis</i>	Showy Orchis		T
<i>Gentiana saponaria</i>	Soapwort Gentian		X
<i>Gentianella quinquefolia</i>	Stiff Gentian		T
<i>Gratiola virginiana</i>	Round-fruited Hedge Hyssop		T
Great Blue Heron Rookery	Great Blue Heron Rookery		
Great Lakes Marsh			
<i>Gymnocladus dioicus</i>	Kentucky Coffee-tree		SC
<i>Helianthus hirsutus</i>	Whiskered Sunflower		SC
<i>Helianthus mollis</i>	Downy Sunflower		T
<i>Hemicarpha micrantha</i>	Dwarf-bulrush		SC
<i>Hibiscus moscheutos</i>	Swamp Rose-mallow		SC
<i>Hieracium paniculatum</i>	Panicled Hawkweed		SC
<i>Hybanthus concolor</i>	Green Violet		SC
<i>Hydrastis canadensis</i>	Goldenseal		T
<i>Hypericum gentianoides</i>	Gentian-leaved St. John's-wort		SC
<i>Ictiobus niger</i>	Black Buffalo		SC
Interdunal Wetland	Alkaline Shoredunes Pond/marsh, Great Lakes Type		
<i>Ipomoea pandurata</i>	Wild Potato-vine		T
<i>Isotria medeoloides</i>	Smaller Whorled Pogonia	LT	E
<i>Isotria verticillata</i>	Whorled Pogonia		T

Scientific Name	Common Name	Federal Status	State Status
Jeffersonia diphylla	Twinleaf		SC
Juncus brachycarpus	Short-fruited Rush		T
Juncus scirpoides	Scirpus-like Rush		T
Kuhnia eupatorioides	False Boneset		SC
Lakeplain Wet-mesic Prairie	Alkaline Tallgrass Prairie, Midwest		
Lechea pulchella	Leggett's Pinweed		T
Lepisosteus oculatus	Spotted Gar		SC
Linum virginianum	Virginia Flax		T
Ludwigia alternifolia	Seedbox		SC
Lycopodium appressum	Northern Prostrate Clubmoss		SC
Mesic Southern Forest	Rich Forest, Central Midwest Type		
Mesodon elevatus	Proud Globe		SC
Microtus ochrogaster	Prairie Vole		E
Microtus pinetorum	Woodland Vole		SC
Morus rubra	Red Mulberry		T
Moxostoma carinatum	River Redhorse		T
Nelumbo lutea	American Lotus		T
Neonympha mitchellii mitchellii	Mitchell's Satyr	LE	E
Nicrophorus americanus	American Burying Beetle	LE	E
Oecanthus laricis	Tamarack Tree Cricket		SC
Oecanthus pini	Pinetree Cricket		SC
Onosmodium molle	Marbleweed		X
Open Dunes	Beach/shoredunes, Great Lakes		
Oxalis violacea	Violet Wood-sorrel		T
Panax quinquefolius	Ginseng		T
Panicum microcarpon	Small-fruited Panic-grass		SC
Panicum polyanthes	Round-seed Panic Grass		E
Pantherophis spiloides	Black Rat Snake		SC
Papaipema beeriana	Blazing Star Borer		SC
Papaipema cerina	Golden Borer		SC
Papaipema maritima	Maritime Sunflower Borer		SC
Papaipema sciata	Culvers Root Borer		SC
Papaipema silphii	Silphium Borer Moth		T
Phlox maculata	Wild Sweet William or Spotted Phlox		T
Platanthera ciliaris	Orange or Yellow Fringed Orchid		T
Pleurobema sintoxia	Round Pigtoe		SC
Polemonium reptans	Jacob's Ladder or Greek-valerian		T
Polygala cruciata	Cross-leaved Milkwort		SC
Polymnia uvedalia	Large-flowered Leafcup		T
Pomatiopsis cincinnatiensis	Brown Walker		SC
Populus heterophylla	Swamp or Black Cottonwood		E
Potamogeton bicupulatus	Waterthread Pondweed		T
Potamogeton pulcher	Spotted Pondweed		T
Prairie Fen	Alkaline Shrub/herb Fen, Midwest Type		
Prosapia ignipectus	Red-legged Spittlebug		SC
Protonotaria citrea	Prothonotary Warbler		SC
Psilocarya scirpoides	Bald-rush		T
Pycnanthemum muticum	Mountain-mint		T
Pycnanthemum pilosum	Hairy Mountain-mint		T
Pycnanthemum verticillatum	Whorled Mountain-mint		SC
Rallus elegans	King Rail		E
Rhexia virginica	Meadow-beauty		SC

Scientific Name	Common Name	Federal Status	State Status
Rhynchospora macrostachya	Tall Beak-rush		SC
Rich Tamarack Swamp	Forested Bog, Central Midwest Type		
Rotala ramosior	Tooth-cup		SC
Sabatia angularis	Rose-pink		T
Sand and Gravel Beach			
Scleria pauciflora	Few-flowered Nut-rush		E
Scleria reticularis	Netted Nut-rush		T
Scutellaria elliptica	Hairy Skullcap		SC
Seiurus motacilla	Louisiana Waterthrush		SC
Silene stellata	Starry Campion		T
Silphium integrifolium	Rosinweed		T
Silphium laciniatum	Compass-plant		T
Silphium perfoliatum	Cup-plant		T
Sistrurus catenatus catenatus	Eastern Massasauga	C	SC
Southern Hardwood Swamp			
Southern Wet Meadow	Wet Meadow, Central Midwest Type		
Spartiniphaga inops	Spartina Moth		SC
Speyeria idalia	Regal Fritillary		E
Spiranthes ochroleuca	Yellow Ladies'-tresses		SC
Spiza americana	Dickcissel		SC
Strophostyles helvula	Trailing Wild Bean		SC
Sturnella neglecta	Western Meadowlark		SC
Tachopteryx thoreyi	Grey Petaltail		SC
Terrapene carolina carolina	Eastern Box Turtle		SC
Tipularia discolor	Crane-fly Orchid		T
Trillium recurvatum	Prairie Trillium		T
Trillium sessile	Toadshade		T
Triphora trianthophora	Three-birds Orchid		T
Triplasis purpurea	Sand Grass		SC
Utricularia inflata	Floating Bladderwort		E
Utricularia subulata	Zigzag Bladderwort		T
Valeriana edulis var. ciliata	Edible Valerian		T
Valerianella chenopodiifolia	Goosefoot Corn-salad		T
Vitis vulpina	Frost Grape		T
Wet Prairie	Wet Prairie, Midwest Type		
Wilsonia citrina	Hooded Warbler		SC
Wolffia papulifera	Water-meal		T
Zizania aquatica var. aquatica	Wild-rice		T

Most *Species of Special Concern* are noted as such because of declining populations in the state. Should these species continue to decline, they would be recommended for Threatened or Endangered status. The goal is protection of 'Special Concern' species before they reach dangerously low population levels. A "threatened" species is one that is likely to become endangered in the near future. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range.

A6. Cultural and Historic Resources

Physical Environment

Archaeological Resources

Noted in the book, The Michgian Roadside Naturalist by J. Alan and Margaret Holman, Berrien County has significant mastodon and mammoth sites. Eight mammoth and thirteen mastodon remains have been found. No remains are documented to have been found within the park.

Some shipwreck debris has found its way to shore, according to the current park manager (Mike Terrell). Remnants of old piers where lumber was shipped to Chicago after the Civil War can also be found within the park boundaries.

Buildings and Structures

At the northern most part of WDSP, lie the ruins of an old church campground. Approximately 15 buildings made up the campground and included a bowling alley in the basement of the main lodge. Today, only the concrete foundations of these buildings remain due to a fire many years ago. The brick pump house is visible from the lakeshore.



Cultural Environment

The Potawatomi Indians lived in the area during the late 17th century, having returned to their homeland following a migration to Wisconsin in the mid-17th century. The migration was the result of fighting between the Iroquois, Huron and Algonquin tribes.

A7. Education and Interpretation

Explorer Guide

Warren Dunes State Park is one of the 41 State Parks that offers the Explorer Program. Topics include forests, insects, night hikes, pond studies and other topics covering the variety of plants, animals and natural features found within each park. These programs are designed for children and adults, often in a family setting

Stewardship

The dune grass seed collection and invasive species control that stewardship provides are instrumental to the preservation of WDSP.

A8. Regional Recreational Resources

This section presents the recreational resources available at Warren Dunes State Park as well as recreational facilities in the southwest region.

A 8.1 Park Recreational Resources - Current Land Use within the Park

Warren Dunes features several named dunes including Mt. Fuller, Pikes Peak, and Mt. Edwards, and Tower Hill which is 240 feet (73 meters) above the lake. Located beside the beach parking lot, Tower Hill is the most visible to visitors, many of whom delight in scrambling up its slopes and rushing back down again.

Day-Use – There are three large beach parking lots, four restrooms, four picnic areas, two shelters, 2.5 miles of lakeshore and one mile of designated beach, and a concession building that offers food, soft drinks, ice cream, clothing and souvenirs from May through September.

Camping - Six organizational sites exist for group use, 185 modern campsites with 50 amp service, 36 semi-modern campsites, two modern toilet/shower buildings, playground equipment and three mini cabins.

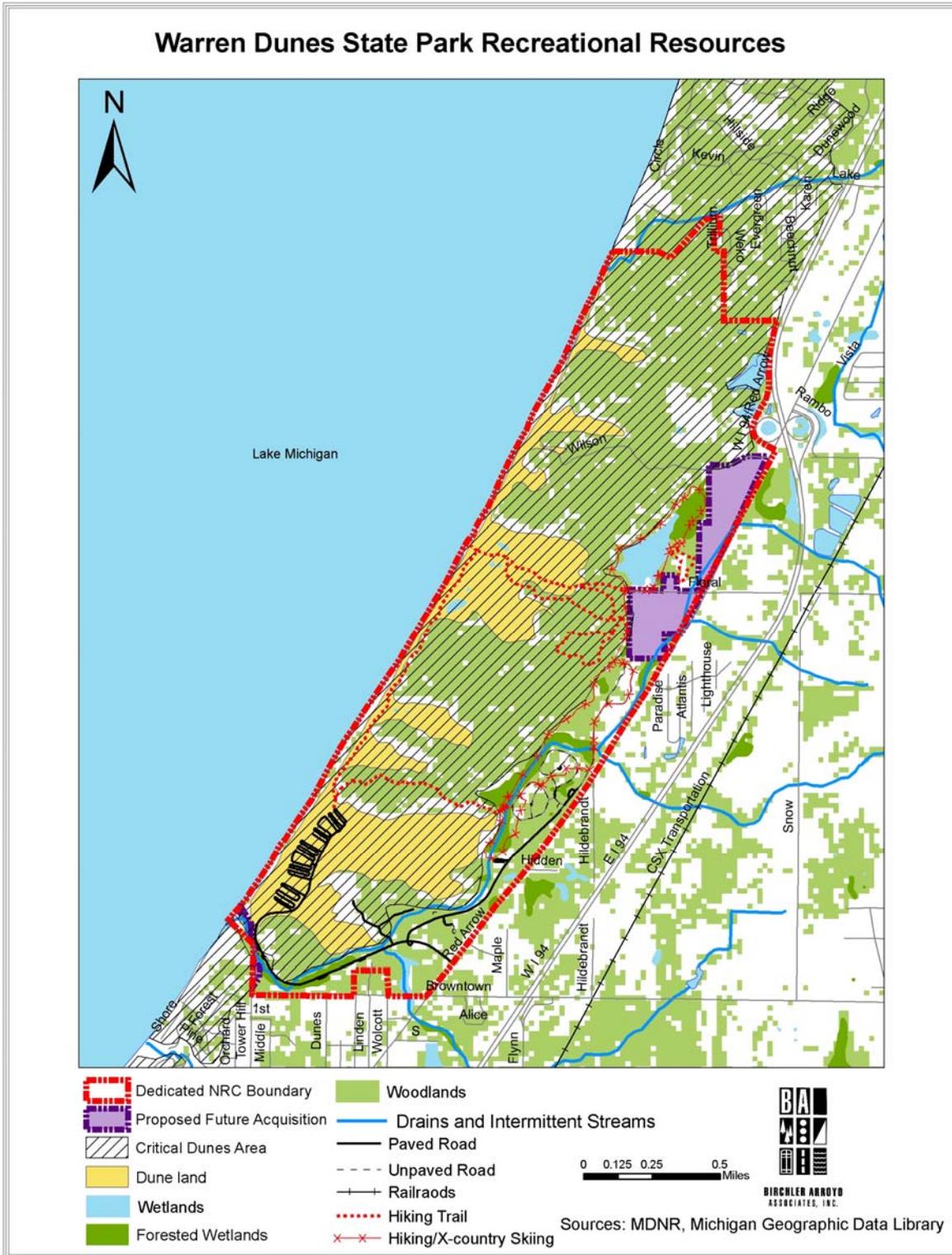
Hunting – All hunting and trapping are allowed (in season) in specific areas of the park (primarily the northern end).

Activities - Approximately two-thirds of Warren Dunes visitors come for swimming and sun-bathing, while about one-third utilize the three campground facilities. Dogs are allowed in the park, but are not permitted on the beach area at any time.

Metal detecting is recognized as a legitimate recreation activity when it is conducted in ways that do not damage the natural and cultural resources in Michigan State Parks nor violate applicable state statutes. Maps are provided indicating where this activity may take place. Any items found must be reviewed by park staff and may be retained for further investigation.

There are six miles of winding trails for hikers. Cross-country skiing is also popular at this park.

Map 12: Park Resources



Because of the dunes, sand-boarding is a popular sport. Sandboarders will find many good runs within the park, some with easy access and some hidden locations. Some of the tallest and steepest slopes run down to the parking lot. This area has good variety to suit all types of sand boarding preferences. Sandboarding enthusiasts have expressed an interest in holding regular sandboard competitions at this park.

Hang gliding is a popular activity at the park. Tower Hill is the primary launch location and is a popular place for training. With proper wind conditions hang gliders can travel as far as New Buffalo (12 miles to the south), which is a popular out and return day trip. Cook Energy Center/Nuclear Plant, to the north is another popular destination. Permits are required to fly at Warren Dunes State Park, and cost \$10/day or \$30/year. Hang I certification is required and paragliders are not allowed.



View from top of Tower Hill in 1978. Photo by Kristie Birren

Areas of Conflict



A major problem in WDSP is the illegal harvesting of Ginseng. Ginseng is used to reduce the effects of stress, improve performance, boost energy levels, enhance memory, and stimulate the immune system. Oriental medicine has deemed ginseng a necessary element in all their best prescriptions, and regards it as prevention and a cure. It is said to remove both mental and bodily fatigue, cure pulmonary complaints, dissolve tumors and reduce the effects of age.

Other problems at Warren Dunes include speeding on park roads, alcohol and gang-related activities.

A 8.2 Regional Recreational Resources - State Parks

Warren Woods State Park is located approximately 2 miles from Warren Dunes State Park. Two-thirds of Warren Woods Natural Area's 311 acres consist of a beech/maple climax forest. A quiet hiking trail leads over a bridge that looks over the rustic Galien River in this undisturbed natural area.

Grand Mere State Park, located about 3 miles from WDSP, offers dune areas, nature trails, a picnic area with shelter. Park activities include hiking, hunting/trapping, boating, fishing, and bird watching. Cross-country skiing is available in the winter months. A boat launch provides access to Middle Lake, a small inland lake with no access to Lake Michigan. These waters offer fishing, boating and hunting opportunities.

Van Buren Trail State Park, about 24 miles from Warren Dunes State Park, is a 15-acre linear park featuring a dirt or gravel surfaced multi-use trail that runs between Hartford and South Haven.

Van Buren State Park, about 31 miles from Warren Dunes State Park, has one mile of sandy beach and high dune formations along the Lake Michigan shoreline. This 400-acre park offers camping, hunting, swimming and hiking.

Indiana State Dunes National Lakeshore, about 30 miles from Warren Dunes State Park, is approximately 15,000 acres, contains 25 miles of Lake Michigan shoreline and eight beaches. It is situated between Gary and Michigan City, IN. Camping facilities are available at Dunewood Campground (just south of US 12 via Broadway) in the National Park, at nearby Indiana Dunes State Park, or at private campgrounds.

Indiana Dunes State Park, located about 41 miles from Warren Dunes State Park, contains 2,182 acres and three miles of Lake Michigan shoreline. Recreational opportunities here include swimming, camping, hiking, fishing, picnicking and cross-country skiing.

A 8.3 – Regional Resources - State Forest Lands/Federal Lands

There are no State forests or Federal lands in the nearby area of Warren Dunes State Park.

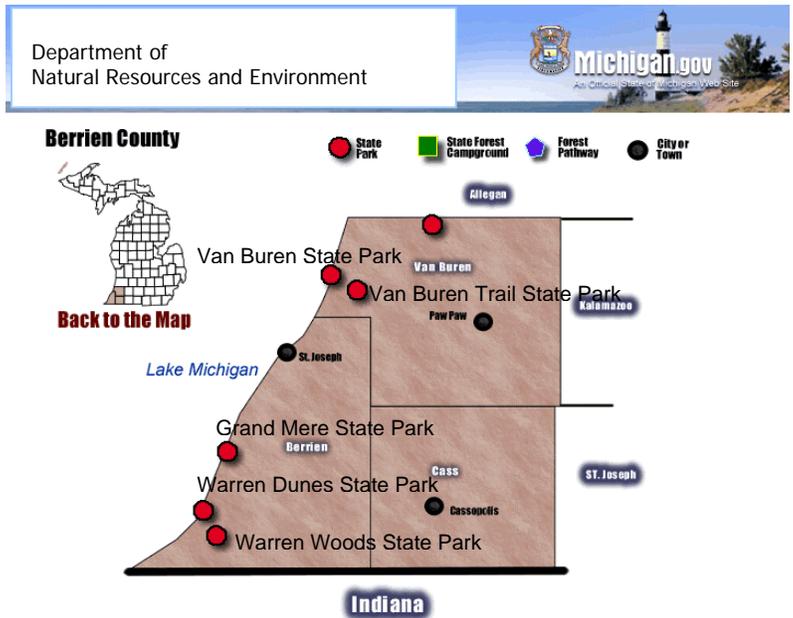
A 8.4 – Regional Resources – Local Recreation Resources

Trails

The “Backroads Bikeway” trails provide twelve self-guided tours on paved area roads, with lengths from 5 to 60 miles. The routes follow secondary roads over rushing streams and through picturesque rolling hills, patchwork farmland and beautiful meadows, parks and forests. Attractions along the way include the New Buffalo Railroad Museum on the Union Pier, Lake Michigan Trails, Warren Woods State Park, Warren Dunes State Park and Grand Mere State Park.

Warren Dunes Trail (35 Miles) Pedal through the peaceful, rustic villages of New Troy, Baroda, Stevensville, Bridgman, and Sawyer. Climb the sand dunes, picnic, swim and camp at Warren Dunes State Park.

Grand Mere Trail (50 Miles) This trail runs along the Sunset Coast countryside, runs through Stevensville and into Warren Dunes State Park.



Boat Launches/Marinas

There are 7 marinas in Berrien County, 5 in St. Joseph, one in New Buffalo and one in Benton Harbor. There are 13 boat launches located within the county. Boat launches near the park are located at Weko Beach Township Park in Bridgman, on the St. Joseph River in Berrien Springs, 14 miles east of the state park, and the Galien River access site in Galien on Pulaski Hwy, 14 miles southeast of the state park.

Parks/Other

Weko Beach Township Park

Located one mile north of Warren Dunes State Park. Weko Beach is one of the key attractions of Bridgman. It is situated on the shores of Lake Michigan and is connected to Warren Dunes State Park to the south. Visitors can walk from Weko Beach into Warren Dunes State Park. Weko Beach Park & Campground has 900 ft. of Lake Michigan beach, 43 developed sites, 22 primitive sites, four log camping cabins, bathhouse, restrooms, dump station, swimming, picnic area & playground. Leashed pets allowed only in campground.

Much of the park contains steep wooded dunes. Tanner Creek empties into Lake Michigan just beyond Weko's border with Warren Dunes. Tanner Creek is popular for smelt fishing in the spring. Since 2006, Weko Beach has been the host site of the Lake Michigan Shore Wine Festival which showcases the wines from 11 local wineries in Southwest Michigan. The event is held the last weekend in June. The festival includes wine tasting as well as live music. Summer concerts are held in the park from Memorial Day until Labor Day.

Lake Township Park

Lake Township Park, a few miles from Warren Dunes State Park offers covered picnic areas, baseball and softball diamonds, and playgrounds. Ten acres of the northeast corner of the Township Park, located at the corner of Gast and Snow roads, has been landscaped and a small lake created. Lake Township Park is open from April to October and the pavilion can be rented for family reunions and company picnics.

Galien River County Park is located 7 miles south of Warren Dunes State Park. In June 2001, the Berrien County Parks Commission acquired 86 acres in New Buffalo Township to establish the Galien River County Park Preserve. This undeveloped property includes a mix of upland and wetland habitats along the Galien River. The wetland area is particularly significant in that it is a part of the larger "New Buffalo Marsh," a Great Lakes marsh that formed along the Galien River just upstream from the river's mouth at Lake Michigan. Planned future developments include an Interpretive Center, observation platforms and boardwalk trails in the wetlands and to the river's edge.

Silver Beach County Park

Located 15 ½ miles north of Warren Dunes State Park in St. Joseph at the mouth of the St. Joseph River, Silver Beach County Park features a clean, wide beach on Lake Michigan and public access to the South Pier. It is a favorite destination for a variety of

beach and riverfront activities, ranging from swimming and beach volleyball to sunset strolls. Children's playground structures, barrier-free walkways, and the Shadowland Pavilion (which can be reserved for family gatherings and other special events) add to the many recreational opportunities available. Silver Beach is also host to many special events, including activities that are a part of St. Joseph's annual Venetian Festival.

Love Creek County Park

Love Creek County Park is located 17 miles east of Warren Dunes State Park. Love Creek winds its way through this rolling 150-acre natural area outside of Berrien Springs, Michigan. Six miles of hiking trails provide access to a variety of habitats, including a mature Beech-Maple forest with spectacular spring wildflowers. The Berrien County Parks Commission's naturalist service is based here and activities are available throughout the year. Love Creek offers outstanding cross-country skiing opportunities with groomed and lighted trails and ski rentals available. The new Fields & Forests Bike Trail also provides cyclists with access to a 4.25 mile beginning to intermediate level mountain bike trail from spring through fall.

Road End Beaches (Chikaming Township) are created by county road rights-of-way that extend to Lake Michigan. These narrow beaches (between 33 and 66 feet) have stair accesses with platforms and limited street parking. There are six road-end beaches: Townline, McKinley, Miller and Berrien in Union Pier, Pier Street in Lakeside and Harbert in Harbert.

Cherry Street Beach (Chikaming Township)

The Warren family deeded this park in 1922. It is the largest beach in the township, with approximately 253 feet of shoreline. It has drinking water, a port-a-potty and parking. There is a street level observation platform, which is handicapped-accessible and a picnic site that is handicapped-friendly. Parking on the weekends and holidays from Memorial Day weekend to Labor Day weekend is by property owner pass when an attendant is on duty.

Harbert Community Park (Chikaming Township)

This park contains a pavilion with two grills and 12 picnic tables. Also available is a playground and a regulation size Little League Baseball Field with bleachers and a concession stand.

The Harbert Road Nature Preserve (Chikaming Township)

This 90-acre preserve area is diverse, providing habitats for bird study, wildlife ecology, flower and tree identification or just enjoying a walk in the woods. Trails lead from there into the five distinct natural communities in various successions of growth. Two ponds and wetland attract wood ducks, mallards, and blue and green herons. There is no hunting and no motorized vehicles allowed.

Chikaming Township Park and Preserve

This park is 263-acres and includes uplands, wooded floodplains, 2,800-feet of frontage on the Galien River and a 5.3-acre lake. An informal walk through and a preliminary inventory identified 131 native species of plants including two threatened species. Plans

are in process to develop this unique site and will include a road to the lake, a picnic area, viewing platforms and trails.

The Cook Energy Center, located 5 miles north of Warren Dunes State Park and on the grounds of the Donald C. Cook Nuclear Plant, offers educational and recreational programs and facilities. The center is currently open to school groups and summer internships only. The Cook Nuclear Plant is located on 650 acres along Lake Michigan's eastern shoreline. The plant is owned and operated by American Electric Power.

Fernwood Botanic Garden, located in Niles, approximately 13 miles from Warren Dunes State Park contains gardens surrounded by forest on 105 acres of cultivated and natural areas along the scenic St. Joseph River valley. This park contains miles of trails, an art gallery, fern conservatory, nature center, cafe, and gift shop. Fernwood offers many possibilities for learning and enrichment, including classes, workshops, lectures, concerts, trips, exhibits, and special events.

Sarett Nature Center, located about 22 miles from Warren Dunes State Park in Benton Harbor, contains nearly five miles of trails, including boardwalks and observation platforms within a 500-acre nature center. One of the trails is barrier free. Trails that run atop the Paw Paw River bluffs provide great views of the river valley below, and boardwalks down in the floodplain give an up-close look at wetland habitats and wildlife. This site also contains a unique alkaline wetland called a fen.

There are numerous attractions in the area, including festivals & events, antique shops, amusement parks, biking, boating charters, marinas, bowling, campgrounds, canoeing, casino's, dune buggy rides, golf courses & driving ranges, health centers, horseback riding, hunt clubs, miniature golf, museums, parasailing, riding stables, shopping, theatre & music, u-pick produce, wineries, and youth centers.

An inventory of existing recreational facilities and programs in the immediate area is an essential step in the recreation planning process. Regional facilities are summarized in Table 5.

Recreational Resource	County	Municipality	Features																
			Picnic Area	Hiking	Hunting/ Trapping	Biking	Play-ground	Equestrian	Swimming	Boat Launch	Snow Mobiling	XC Skiing	Concession/ Vending	Camping	Drinking Water	Rest Rooms	Showers	Sport Field/Ct	Fishing
State Resources																			
Grand Mere State Park	Berrien	Lincoln Township	X	X	X					X		X							X
Warren Dunes State Park	Berrien	Lake Township	X	X	X		X		X			X	X	X	X	X	X		X
Warren Woods State Park	Berrien	Lake Township		X															
Van Buren Trail State Park	Van Buren	South Haven		X		X						X							
Van Buren State Park	Van Buren	South Haven	X	X	X		X		X										
Indiana Dunes National Lakeshore		Porter, IN	X	X		X	X	X	X				X	X	X	X	X		X
Indiana Dunes State Park		Chesterton, IN	X	X		X			X			X							X
County Resources																			
Galien River	Berrien	New Buffalo Township		X															
Love Creek	Berrien	Berrien Springs		X		X						X							
Madeline Bertrand	Berrien	Niles	X	X		X	X					X							
Rocky Gap	Berrien	Benton Twp.	X						X										
Silver Beach	Berrien	St. Joseph	X				X		X										X
Municipal Resources																			
Lake Township Park		Lake Township	X				X												
Lincoln Township Community Center		Lincoln Twp	X				X												X
Glenlord Beach		Lincoln Twp																	
Lakeshore Youth Baseball & Softball Park		Lincoln Twp											X						X
Lakeshore Youth Soccer Park		Lincoln Twp																	X
North Lake Park		Lincoln Twp	X																X
Rudnick Park		Lincoln Twp	X																X
Township Beach & Nature Trail		Lincoln Twp		X															
Cherry Street Beach		Chikaming Twp	X						X							X	X		
Harbert Community Park		Chikaming Twp	X				X											X	X
Harbert Road Nature Preserve		Chikaming Twp		X															
Chikaming Twp Park and Preserve		Chikaming Twp		X															
Road End Beaches		Chikaming Twp							X										

A9.

Park Use and Economic Impact

Park Use Statistics and Economic Impacts

A9.1 Park Use

WDSP is easy to reach via Interstate 94. From the west, the park is within an hour drive from Gary, IN and a ninety-minute drive from Chicago, IL. It is about 3 hours west of metropolitan Detroit where 42% of Michigan's population lives. Its close proximity to the I-94 corridor helps to account for why there were more than 900,000 visits to the park in 2007. Of these, 10% were campers and 90% were day-users. Total revenues (Motor Vehicle Permits and Camping Fees) generated by the park in 2007 exceeded \$716,912.17.

Characterization of park use is described as follows: (based on DNRE-Park Attendance Statistics)

- ❑ Summer Use Season (June – August): This is the busiest season for WDSP, producing 70% of all camping and 68% of all day-use takes place during these months. 61% of cabin use takes place in this period.
- ❑ Fall Use Season (September – November): 21% of all camping activity and 13% of all day-use take place within this season. 28% of cabin use takes place during this time period.
- ❑ Winter Use Season (December – March): Very little camping occurs during the winter--less than 0.1% of yearly camping takes place at this time. Day-use activity drop off also -- 6% of day-use activity occurs during this time.
- ❑ Spring Use Season (April – May): Increasing park use in all categories. 9% of camping use, 13% of day-use, and 11% of cabin use.

From “MI CRS Statistics 2007“ reported by Spherix (most recent report), the state contractor that administers the Campground Reservation System (CRS), Warren Dunes SP received 92,266 campground reservations in 2007. From the same source, the following statistics (2007 data) are attributable to Warren Dunes SP:

- ❑ Warren Dunes SP had gross revenues from October 2006 through November 2007 of \$12,954,000. Of this amount, \$4,122,000 (32%) came from Camping and \$8,833,000 (68%) came from day-use.
- ❑ The average number of people per reservation was 3.5, exceeding state average of 2.7 people.
- ❑ The average length of stay in 2007 was 2.1 days, less than the state average of 2.5 days. The longest length of stay in the state was Grand Haven SP with 4.5 days and the shortest were Highland and Straits State Parks with 1.7 days.

A9.2 Economic Impact

Michigan State University (Dr. Dan Stynes) developed an economic analysis model known as “MGM2”. This model is an update of the MGM model developed by Dr. Ken Hornback for the National Park System in 1995. The purpose of the updated MGM2 model is to estimate the impact of park visitor spending on the local economy. These economic impacts are reflected in terms of sales, income, employment, and value added.

This analysis tool, like others, relies on three primary factors in the common equation:

Economic Impact of Tourism Spending = Number of Tourists (x) Average Spending per Visitor (x) Multiplier (to estimate extended effects of direct spending).

To conduct a very basic review of impacts, the “MGM2-Short Form” version of the program is used, which simplifies the extent of analysis required for input, and utilizes more generalized multipliers for spending outputs. This analysis provides good tool for establishing a baseline assessment of the economic impacts of the state parks.

Economic impacts of Warren Dunes SP to the local community are significant. Berrien County is a medium density county relative to its metropolitan neighbors. The area around Warren Dunes State Park is characterized as rural. With Warren Dunes drawing the great majority of users from outside the county, local business benefits from the influx of this ‘new’ money to the local economy.

Following are the relative economic impacts (based on 2007 data) of Warren Dunes SP to the economy of Berrien County:

Direct Economic Effects to the Community

The MGM2 Model results indicate that Warren Dunes State Park is contributing to the local economy (based on 2007 data):

- ❑ Direct Spending attributable to Warren Dunes State Park totaled \$12,954,000 (\$8,833,000 came from Day-Use, and \$4,121,880 from Camping)

- ❑ Jobs created totaled 408 (Note: jobs may include full-time, part-time and seasonal employment).
- ❑ Personal Income totaled \$4,406,000
- ❑ Value added (total income plus business taxes) totaled \$6,651,000

Total Economic Effects to the Community

Total economic effects reflect 'Direct Effects' plus the 'Secondary Effects' of visitor spending on the local economy. Secondary Effects (sometimes called 'Multiplier Effects') capture economic activity that results from the re-circulation of money spent by the park visitors in the community. Based on 2005 data, the estimated total economic effects for the area surrounding Warren Dunes State Park are:

- ❑ Total Spending: \$17,126,000
- ❑ Jobs: 476
- ❑ Personal Income: \$5,795,000
- ❑ Value Added: \$9,222,000

Appendix B

Stakeholder & Public Input Workshop Results

Public Participation

The Department of Natural Resources and Environment Recreation Division (DNRE-RD) emphasized that comments on the general management plans would be accepted at any time during the process. The formal public participation program included an extensive public participation component in the general management plan process. The participation initiatives are summarized below, and the results are presented in this Appendix.

- ❑ **February 12, 2009 Stakeholder Workshops:** The purpose of the two workshops was to obtain comments on the draft General Management Plans for 1) Holland State Park and Saugatuck Dunes State Park, and 2) Grand Mere State Park, Warren Dunes State Park and Warren Woods State Park. With assistance from the Planning Team, approximately 138 people and organizations were identified as stakeholders. Invitations to the Stakeholder Workshops were sent by email, mail and phone. Thirty-five people attended the two workshops. The sign-in sheet is included in this Appendix.

Stakeholders were invited to comment at the meeting. Stakeholders could also comment by completing a survey. The surveys were provided at the workshops and were also available on-line.

- ❑ **April 30, 2009 Public Input workshops for Grand Mere State Park, Warren Woods State Park and Warren Dunes State Park.** The above noted people were again contacted regarding the public input workshops by mail and email. Stakeholders and others were encouraged to share this information with interested members of the general public. Two sessions, one from 2:30 – 5:00 p.m. and the second from 6:30 – 9:00 p.m., provided opportunities for the public to attend, learn about the process and comment on the draft plans. Approximately 25 people attended the two sessions.

There were three opportunities to provide comments:

- 1) Comment at the workshop.
- 2) A hard-copy survey available at the workshop
- 3) The survey was available online

Comments provided in response to February 12, 2009 Stakeholder Workshop (Warren Dunes State Park)

Warren Dunes

- Who manages Painterville Creek / Drain? – periodic blockage of delta backs water up onto private properties & causes potential public health hazard.
- There was overall concurrence to expand the “Natural Area” designation
- Relocate the Organizational Youth Campground; the peak youth camping periods seem to coincide with the peak spring and fall migration periods – when the largest numbers of birders utilize the park, resulting in a very congested park.
- Campers routinely cut down any dead tree within reach, many of which provide good locations for viewing perched birds in the open.

Comments provided in response to April 30, 2009 Stakeholder Workshop

Warren Dunes and Warren Woods

- Need a renewed educational effort about ecological significance of Painterville Creek.
- Boy Scout camping & birding activities occasionally have conflict with regard to parking impact.
- Louisiana Waterthrush (not Warbler)
- Dog owners are allowing their animals to run free at Warren Woods – need new/improved signs.
- Expansion of trail from Bridgman may increase incidence of home break-ins.
- Warren Dunes & Grand Mere are not appropriate areas for hunting – most access through Weco.
- How does PRD identify zone boundary on the ground.
- Is snowmobiling always allowed in any Natural Resource Recreation zone?
- Heavy camping use at Warren Dunes strains protection of the resources.
- Visitors in creek appear to be damaging the ecology, stream bank, water quality – consider posting park rule prohibiting the activity.
- Walking creek not problem – damage to the bank is the issue.
- Fall, early Winter, Spring – visitors with dogs gain beach access through Weco Beach – place for dogs is NOT on beach.
- Do any State Parks permit vendor equipment rentals?
- Check mapped northern boundary WDSP
- 250 acres at north end of WDSP should remain untouched in its natural state with no use.
- Sarett Nature Center runs many educational programs for school children in these parks.
- Activity along Painterville Creek has destroyed clear water and wildlife (damage to banks by clay people)
- Wikipedia may have helped accelerate damage to Painterville Creek bank –add posting.

- Walkers through creek pass through private property and park users adversely impact quality of life for neighbors.
- Signage ineffective at educating visitors about public health hazard & physical dangers.

Survey responses:

- **Statements of Significance**
 - Bird migration: deep lake and beach habitats attract huge numbers of waterfowl and shorebirds during spring and fall migrations. Wooded dunes provide feeding and resting habitat vital to neo-tropical migrants.
 - Scenic: Dune blowouts provide spectacular lake views as well as desert-like conditions that favor unique plant species.
- **What natural resources are important?**
 - The dunes, water
- **What are the education and interpretation?**
 - Night hikes
- **Identity for Warren Dunes State Park**
 - A place to swim, sunbathe, hike, learn and relax
- **Other comments**
 - It was great to meet Mike tonight; how about a regular schedule (once/month?) of occasions to interact and have us (the local public) get to know each other better?

Input for 4/30/09 Meeting Regarding General Management Plans for Warren Dunes State Park

My family has had a second home on Tower Hill Road since the 1930s. I spent all my summers as a child going to Warren Dunes State Park. We have always walked to the beach using the footpath to access the southern entrance to the park. This path starts just west of the footbridge and runs along Painterville Creek and it is in this area that I hope you can help us.

Painterville Creek used to be filled with minnows, frogs and a few times even catfish. Now all life is gone due to the clay content of the creek. Every weekend, hundreds and maybe even a thousand beach goers walk the creek in search of clay deposits to rub over their body and act like warriors or monsters. In looking for the clay several unfortunate things have happened:

- A) The most serious is the loss of life in the creek water and I think the creek may now contain unhealthy bacteria and the like. Children often play in the creek and I think there may be a health concern.
- B) In looking for the clay, many beach goers are climbing up the dune on the north side of the creek; in doing so the vegetation that held the dune in place in the past has all died and now the dune is eroding and the path is falling into the creek.
- C) The erosion of the dune between the creek and the beach path is part of the dune supporting the entrance road leading to the parking lots. At some point the road may be in jeopardy.

In addition there are two other areas that I would appreciate your addressing:

- 1) There is a set of stairs leading from the entrance road to the beach. These stairs are located just where the road turns north on the way to the first parking lot. These stairs are being overrun by vegetation which grows all around the stairs and even on the stairs, making the use of the stairs hazardous at some points. I believe some basic pruning and cutting back at the beginning of each season would save these stairs.
- 2) The southern most beach house is hardly used anymore. Since there are two other beach houses I wonder if the unused one could be torn down to allow more beach area.

Thank you for your consideration in these matters.

Lucy Sullivan
12197 Tower Hill Road
Sawyer, MI 49125
773/972-2442 (cell phone)

PARKS MANAGEMENT PLAN – WARREN DUNES, WARREN WOODS, GRAND MERE

My wife and I live in Bridgman, just north of Warren Dunes State Park. We petitioned the state in 2006 to include the north end of Warren Dunes in the natural area designation. I have hiked and birded the area for nearly three decades.

WARREN DUNES

I surveyed Warren Dunes State Park for the Michigan Breeding Bird Atlas I (1983-1988) and Atlas II (2002-2008). Species of Special Concern (SC) that nested in the park included Cooper's hawk, red-headed woodpecker and hooded warbler. One Michigan Endangered Species included the prairie warbler. Some of the most noteworthy nesters over the years were summer tanager and worm-eating warbler.

The mix of northern and southern species nesting in Warren Dunes is interesting. Some of the southern nesters include the summer tanager, prairie warbler and worm-eating warbler mentioned above. Northern species included magnolia warbler, blackburnian warbler, Canada warbler and black-throated green warbler.

Other species seen during the breeding season, but not confirmed as breeding, include Louisiana waterthrush (SC) and American bald eagle (T).

The endangered piping plover has also been seen moving along the shore in Warren Dunes during migration.

SUMMARY

From a bird migration perspective, parks like Warren Woods, Grand Mere and Warren Dunes are vital. Neo-tropical migrants use the woodlands and beaches as refueling stops on their migration to northern breeding areas and back again in the fall.

We fully support placing more park area under the Natural Area designation. Keeping this land in the Primitive Zone is appropriate in our view.

Warren Woods, Warren Dunes as well as Weko Beach, New Buffalo Beach, Jean Klock Park, all owe their existence to Edward K. Warren. It is my hope that the Parks Management Plan helps perpetuate his legacy by keeping areas in the parks in a "primeval state" for the public to enjoy in perpetuity.

COMMENTS SUBMITTED BY:

Brad & Hannah Anderson
9738 Beechnut St.
Bridgman, Michigan, 49106
(269)465-3152

April 30, 2009

Rebecca Humphries, Director
Michigan Department of Natural Resources
Mason Building, P.O. Box 30031
Lansing MI 48909

Dear Director Humphries,

I'm writing to comment on the draft management plan for Warren Dunes State Park and to support the expansion of the existing state-designated natural area within the park.

Although I have not located a specific recommendation within the plan for expansion of the natural area, the accompanying map appears to be consistent with its expansion. I commend the Department of Natural Resources for this recommendation.

As noted in previous correspondence with the Department, there is extensive documentation of the botanical value of the area we propose for designation. The late Dr. Warren Herbert Wagner, Jr., a nationally recognized botanist, surveyed the area and in 1979 concluded "...that the mature dune forest in the area north of the north boundaries of the Park, especially in the vicinity of Mount Edward, is the richest in the entirety of Lake Michigan's shores, not only in terms of species diversity but community complexity as well." Dr. Wagner recommended "that the land be set aside as a natural area...with the understanding that its natural values be preserved in perpetuity."

The land in question has other substantial scenic, natural resource, and quiet recreation values that will best be conserved through natural area status.

Although I am no longer a resident of Michigan, I hope you will include this in the public record. Warren Dunes State Park has Great Lakes regional significance and is enjoyed and treasured by millions of out-of-state residents as well as Michiganders.

Thank you for the opportunity to comment.

Sincerely,

Dave Dempsey
3309 136th St., W.
Rosemount, MN 55068

WARREN DUNES STATE PARK MANAGEMENT PLAN
Addendum to Workshop Input Sheet
Brad Anderson, 5/5/09

The following pictorial is my attempt to show the location of the proposed bike trail, which was described at the public hearing on April 30, 2009. It was stated at the meeting that the proposed bike trail could enter Warren Dunes State Park through Floral Lane in Lake Township. The bikes would be allowed to proceed to the Nature Trail, then south to the camping area.

Picture #1 shows Floral Lane, near Red Arrow Highway, just south of I-94 Exit 16, Bridgman:



Picture #2 is looking west from the Floral Lane cul-de-sac. In the distance is the junction for the Nature Trail, Blue Jay Trail and Yellow Birch Loop.

The folks in the background are birding in the area.



2

JUNCTION for Blue Jay, Yellow Birch and Nature Trails

View from Floral cul-de-sac area

Picture #3 shows parts of the old road surface that became the Nature Trail.



3

Nature Trail, south

Blue Jay Trail, west to open dunes

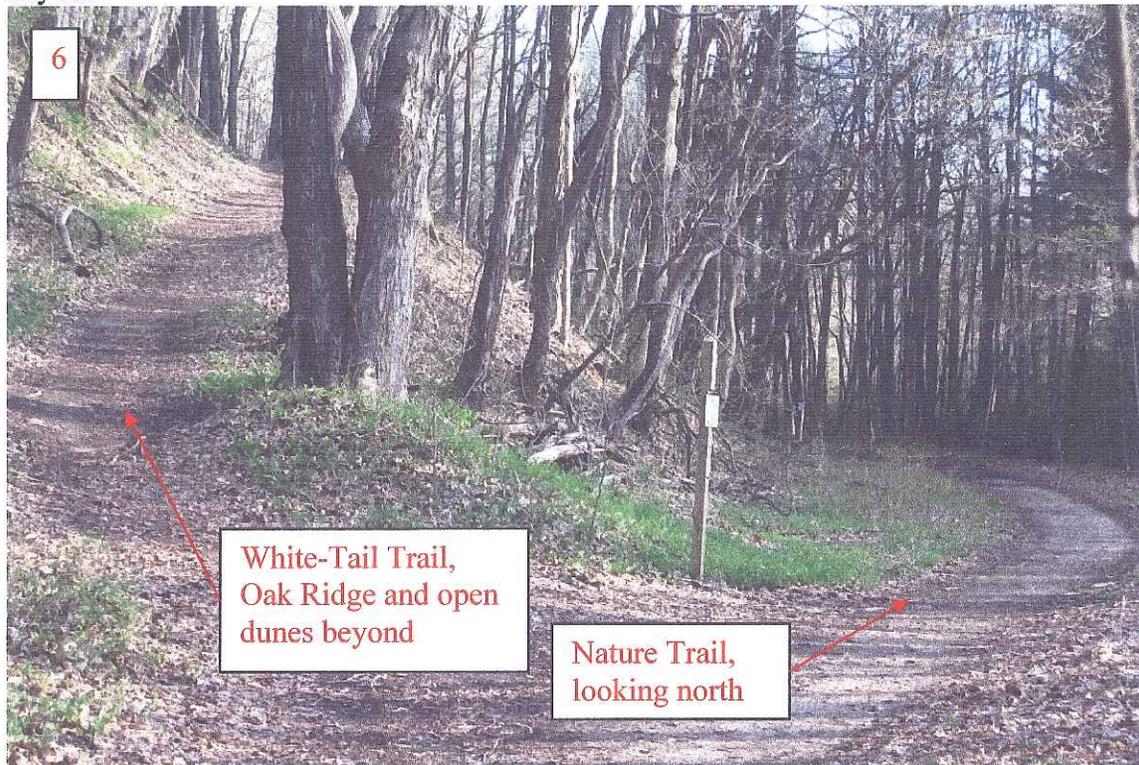
Yellow Birch Loop, north

TRAIL PASSES THROUGH AREA OPEN TO HUNTING

Picture #4 shows the Nature Trail with private property to the left (east) and critical dune to the right. Picture #5 below shows the Yellow Birch Loop.



Picture #6 shows the trail leading to the White-Tail Trail, Oak Ridge and the open dunes beyond.



Summary: The hard surface path of the Nature Trail could easily handle any number of mountain bikes.

I think the larger issue is; how will bike traffic be contained? I don't believe signs necessarily will keep folks off the other trails, if that is the intent (I hope that's the case). Mountain bikes that venture off the hard-surface path of the Nature Trail have the potential to create considerable erosion on the softer trails.

Once the trail is opened up to non-motorized bikes, what will keep motorized dirt bikes and ATV's from entering the trail system and creating erosion and noise problems?

I suspect that mountain bikes and really the people on them could also ruin the hunting experience during the season. Depending on the route the non-motorized path takes from Bridgman, bikes could enter Wilson Lane, which is a private road at the moment. Wilson meanders west, past the private part, to the defunct First Church Camp on the lake.

Another worry is bikes entering the old mining site just to the north of Wilson Lane. This area is heavily hunted during the season.

Critical dunes would be better protected if a hard surface path for walking and biking followed Red Arrow Highway to the main park entrance.

Comments on Michigan Warren Dune GMP: Hello, I have been a park visitor to Warren Dunes for all of my 31 years. My primary comment on the General Management Plan relates to Painterville Creek. Before designating Painterville Creek a "Natural Resource Recreation Zone" and encouraging more use something should be done to control the erosion and pollution caused by the recreational use of the clay pits. I have sent these comments to the Local DNR staff previously on 8/11/08: I spent the last four days visiting the park and couldn't help but notice the environmental disaster that has become Painterville Creek. The creek was a stagnant pool of scum by Sunday. To my further horror many parents allowed their small children to wallow in this cess pool. Part of the problem was the highwaves which kept the creek from draining, admittedly there is not much that can be done about this force of nature on a day to day basis. However there is a big man made force destroying the creek. This takes the form of the non-stop parade of people wadding up and down the creek to dig up exposed clay and rub it all over themselves and so on and so forth. The creek has run grey in a turbid condition all summer. The turbid condition is due to the clay which people get all over the place. This cannot be good for the creek ecology. As environmentalists, I am sure you know that: a.. Turbidity is the cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye, similar to smoke in air. The measurement of turbidity is a key test of water quality. and b.. The higher the turbidity level, the higher the risk of that people may develop gastrointestinal diseases. This is especially problematic for immune-compromised people, because contaminants like viruses or bacteria can become attached to the suspended solid. Similarly, suspended solids can protect bacteria from ultraviolet (UV) sterilisation of water. c.. Turbid waters become warmer as suspended particles absorb heat from sunlight, causing oxygen levels to fall. (Warm water holds less oxygen than cooler water.) Photosynthesis decreases with lesser light, resulting in even lower oxygen levels. d.. Suspended solids in turbid water can clog fish gills, reduce growth rates, decrease resistance to disease, and prevent egg and larval development. Settled particles smother eggs of fish and aquatic insects. e.. High turbidity levels can block light from reaching lower depths of water bodies, which can inhibit growth of submerged aquatic plants and consequently affect other species dependent on those plants I have been going to Warren Dunes every summer since I was a child 25 years ago. We used to walk in the Painterville creek every day and except for a few stagnant areas and following rainfalls, the water was crystal clear. I haven't seen clear water in the creeks for years. Every year the amount of human traffic to the clay pits gets higher and higher. I think the park needs to address this problem, whether it is stabilization of the clay seams with rip rap, impassible check dams in the creek nearer to the beach, or the more simple public education as people enter the park. Thomas Powers

*

My concerns are about the area of **Warren Dunes State Park** that borders the far western end of Painterville Creek as it approaches and eventually flows into Lake Michigan. I have visited Warren Dunes State Park since 1976 and thoroughly loved it in all four seasons. My concern is that in the last 2-4 years there appears to be accelerated erosion to the dunes due to over use in the area along Painterville Creek from just above the footbridge to the lake. The sand path that runs from the old picnic grove to the beach has been eroded several feet in the last 2 years with a dramatic increase last year between Memorial Day and Labor Day . Park personnel have recorded measurements that are quite disturbing. Much of this erosion appears to be caused by the increase in foot traffic caused by park visitors looking for clay. Few visitors utilize the old picnic grove since the picnic tables and outhouse were removed. Also removal of the stairs from the small parking lot near the picnic grove has reduced the number of park visitors using the sand path to reach the beach. The vast majority of park visitors using that path are looking for clay to dig. If you sit on the beach on a summer day you will see hundreds of people go up and down the creek and the path seeking clay.

Unfortunately many visitors seeking clay are unwilling to walk too far up the creek to find it. They have begun digging into the dune sidewalls of the creek to expose clay in the area from just above the footbridge to the creek's junction with Lake Michigan. This is causing the dunes to collapse into the creek resulting in erosion of the sidewalls of the creek. Also the large numbers of visitors climbing up and down the walls of the creek to access the clay are also adding to the erosion. To assist them in their climb up and down the creek wall they utilize small trees to pull themselves up. Several of these sapplings were uprooted or denuded of foilage in the process. These small trees are part of the root systems that stabilize the dunes. Park signs have also been pulled out as they were used for the same purpose. Most

of this erosion is not caused deliberately but just due to the very high volume of visitors digging for clay in this area. Vegetation is trampled and large amounts of trash are discarded.

Another concern is the large amount of clay being exposed and deposited in the creek on high volume days. Painterville Creek was home to minnows, frogs and tadpoles. I have seen turtles and muskrats in the past, but no more. The creek water was clear and cool as it flowed to the lake, but from May to September it is now opaque with clay and particulate matter, slimy and putrid. In the area where the creek spreads out into a pond before flowing into the lake it becomes a shallow stagnant tepid pool. Many parents who bring their children to Warren Dunes for a safe enjoyable day do not realize that Painterville Creek is a county drain that has become an ideal reservoir for bacteria under these conditions. As a public health professional this concerns me. Gastrointestinal illnesses can be devastating to young children, the elderly and those who are immunocompromised.

I don't know the answers to these areas of concern, but I hate to see destruction of a beautiful natural resource that the State of Michigan has preserved for the people of Michigan and its neighbors for so many years. I don't think the visitors who are seeking clay intend to do harm it is just that the sheer volume of visitors digging for clay in this particular section of the park is causing the erosion and pollution of the creek. Maybe managing the areas designated for clay digging better would help diminish the erosion. Discouraging random damage to dunes and vegetation in the search for clay with engineering controls might be part of the solution. Public education definitely has a role in preventing damage. I hope that for the future preservation of this section of Warren Dunes, prevention of erosion and damage caused by overuse is included in the management plans as well restoration of damaged areas.

Maureen Powers

Sawyer, Michigan 4.18.2009 (5:12pm)

Warren Dunes Comment

I agree- the search for clay in the creek has gone from harmless fun to lasting, damaging overuse. In the summer the creek is nothing short of disgusting. The water in the creek more closely resembles a grey, slimy, factory discharge than H₂O. The clay particulates cloud the water and settle on the bottom, turning the sand bottom into a mushy, slimy, thick bottom of goop. When the water gets backed up, as is inevitable due to the downed trees, it is impossible to see logs and stumps hidden under the deep, grey water. Last year my Mom fell when she was walking in the creek due to this exact hidden danger. Also it's impossible to know how deep the water is when you can't even see the bottom. Some of those seeking clay have sprained their ankles and sought medical treatment at the concession stands as well. This problem is only going to continue, especially as clay-seekers erode the dunes surrounding tree roots by scaling up and down the thin sliver of woods on the creek bank, no doubt leading to yet more trees falling. Others have commented on the health hazards & I completely agree. Is the park management going to wait until numerous children get sick & the park gets sued, before taking action? I think it is a shame...when I was little I spent countless hours playing in the safety of the shallow pond right before the creek hits the lake. Now that water is disgusting- I would never let my children play in it.

Lastly, the creek empties into the lake, turning the crystal clear water into murky, cloudy water. Why should the clay-seekers be allowed to spoil the swimming water of all of those at the creek-end of the beach for the sake of a temporary thrill? A lot of people at that end of the beach take the extra effort of walking all that way to enjoy the water, which is cleaner b/c there are fewer people. Then these people put clay on in the creek, walk to the lake, wash it off and are done with it- but the lake water is dirtied by the creek water for everyone, all weekend. You can see the "clayed" water for hundreds of yards in whichever way the wind is blowing. It is simply unfair to allow some to use the park in a way which interferes with the enjoyment of others, especially when that use disrupts the natural beauty of the park and the purity of our water.

I implore the park management to do something- put slabs of concrete over the creek walls where clay is exposed, put up signs, inform people that clay can only be removed from behind the dunes so at least the water can filter out and fewer people will be inclined to go that far, ticket "clay people", something! It is a serious problem, exacerbated by word-of-mouth and insensitivity to the tragedy of the commons problem. Park management must manage this situation. This has gone on long enough.

Molly McGrail

Chicago, Illinois

4.22.2009 (3:00pm)

*

I find the Painterville Creek that runs through the South end of the **Warren Dunes** to be fast developing into a virtual cess pool. A close friend of mine made the mistake of allowing his niece to walk upstream in that filthy stream last summer. Because she had a cut on her ankle that was not fully healed, she developed a nasty infection. One of these days someone is going to suffer a serious health problem and - BECAUSE IT COULD HAVE BEEN EASILY PREVENTED - there will be legal action taken.

I hope that the Warren Dunes Park Management will consider at least these steps to begin with: First, establish a regular schedule of dredging with a backhoe to assure unobstructed flow from the creek into Lake Michigan. Second, begin an informative campaign by distributing flyers to each park visitor cautioning against picking at the clay on the creek's banks because it is a health hazard and does ecological damage. Third, I would like to see permanent signs erected re-inforcing the message of the flyers distributed as item 2.

It is sad to observe that, at a time when our Nation is finally developing concerns about air and water pollution, one little creek seems to be going in the opposite direction. Everything that can be done should be done, to bring back the crystal clear water that used to flow through Painterville Creek. Why? Because, as stewards of our resources, it is quite simply the right thing to do!

Larry J. Powers

4.22.2009 (6:31pm)

Appendix C

Planning Team Meeting Summaries

A G E N D A

DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
RECREATION DIVISION
Grand Mere – Warren Dunes/Warren Woods State Parks
General Management Plans and Regional Assessment Project

DATE: July 22, 2008
TIME: 1:45 - 5:00 pm
PLACE: Lake Township Hall
3220 Shawnee Rd., Bridgman, MI

1. Introductions
2. Project Overview
3. Exercise
 - Your interests
 - First impressions of each park's significance
 - First impressions of each park's purpose
4. Summary: What was heard
 - Summary Report to be emailed - please provide your email address on the sign-in sheet.
5. Planning Team Meeting Schedule
6. Local Citizens Advisory Committee

Meeting Minutes

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT RECREATION DIVISION

Grand Mere State Park, Warren Dunes State Park & Warren Woods State Park
General Management Plan Project

DATE: July 22, 2008

TIME: 1:00 - 5:00 pm

PLACE: Lake Township Hall
3220 Shawnee Rd., Bridgman, MI

1. Project Overview

Paul Curtis, DNRE-PR Management Plan Administrator, began the meeting by providing an overview of the General Management Plan process.

2. Exercise:

Birchler Arroyo Associates led an issues / solutions exercise. A brief description of each park was given, after which participants were asked to identify issues and solutions, as well as the significance and purpose of Grand Mere, Warren Woods, and Warren Dunes State Parks. This meeting followed a tour of all three parks, which took place earlier in the day.

A. Grand Mere State Park

1. Issues

- Doesn't appear on State Highway Map (visibility)
- Currently "neglected" – budget
- Underutilized, non-revenue producer
- Many features of Warren Dunes without the crowds
- Cross Country skiing / hunting conflict
- Some unauthorized ORV use
- Dumping
- Invasive species require control
- ¾ mile hike from parking to beach not for casual visitor
- Users park at Township's informal parking area (Township beach 66' access) causes occasional conflict
- Loop trail over dune is very steep/challenging – often attempted by people who need assistance to return (not adequately signed).
- Nude sunbathing conflicts with private owner neighbors
- Private property owners on GM Road have cut brush/trees for views of Middle Lake.
- Losing vegetation to herbivores, insects & disease.

2. Solutions

- Brush removal around parking area may reduce some problems
- Resolve ownership / access easement issues in southern part

- Increase use to put peer pressure on problem users
- Need increased presence of staff as well as users (stewards)
- Not much more than a roadside stop at present. Needs development of facilities to encourage use.
- Use should be low impact, interpretive-oriented type

B. Warren Dunes State Park

1. Issues

- Protect dunes – “sacrificial” dune not only one being used by adventure seekers with dune boards, etc.
- Need more education about why the dunes require protection
- Engage out-of-state visitors in the education process
- We need more info about the ecology of the dunes from an expert
- How many more park users can the dunes handle, what # employees are needed?
- Missing children are often found in the Painter Creek “Clay pit” – safety issues.
- Chicago-area beaches are often private. Warren Dunes is a tradition for many Illinois residents.
- Warren Dunes is like “up north” for many Illinois residents
- Safety issues related to foundations and other remnants from burned-out church camp (on Warren Foundation land).
- North of Painter Creek is relatively undeveloped, critical dune area Everything south & east is more developed area
- Ginseng is being poached
- Garlic mustard and other invasives are difficult (impossible) to control
- Very low use by minority populations
- Mentoring program intended to introduce city kids to natural areas
- Very limited Native American evidence
- Warren Dunes infrastructure is aging, especially given the extremely high use
- Warren Dunes gives a poor first impression of the State Park System
- Lack of stewardship by out-of-state visitors may relate to condition of facilities
- \$2 million annual improvement fund for 98 parks (Need \$840 million)
- Auto-bicycle conflict on park road

2. Opportunities

- Major Great Lake access (many users out-of-Michigan)
- Significance: *Major revenue generator for the State system, *Could be showpiece to introduce visitors to full State Park system

3. Warren Woods Issues

- “Tree carving” a minor problem
- Greater use may bring more invasive species
- Portion is state-dedicated Natural Area

- Path is not barrier-free but has reasonable accommodation while protecting resource
- Park is “heavily” used as research site.

3. Attendance: Members of the Management Planning Team for Warren Dunes, Warren Woods, and Grand Mere State Parks:

Lt. David Van Sumeren, Plainwell District
Joe Strach, District Planner
Jeff Johnson, Student Assistant
Drew Montgomery, Warren Dunes Unit
Michael Terrell, Warren Dunes Park Manager
Roland Johnson, RD Plainwell District Manager
Jill Bahm, Birchler Arroyo Associates, Inc
David Birchler, Birchler Arroyo Associates, Inc
Rob Corbett, OLAF, lands
Janet Canode, Office of Marketing, Education & Technology
Steve Chadwick, Wildlife Biologist
Kim Dufresne, FMD Fire
Tom Hoane, FMD, Mineral Geologist
Brian Gunderman, Fisheries Biologist
Mark MacKay, WLD DNRE Planner
David Price, FMD, Planning
John Lerg, WLD
Paul Curtis, RD Park Mgt. Plan Admin.

A G E N D A

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT RECREATION DIVISION

Grand Mere State Park – Warren Dunes State Park
General Management Plans – Planning Team Meeting #2

DATE: September 30, 2008
TIME: 2:00 – 5:00 pm
PLACE: Lake Township Hall (3220 Shawnee Rd., Bridgman)

1. Brief Review of Background Analysis for GMSP & WDSP (2:00-2:30)
2. Discussion of Core Values & Preliminary Identification of Management Zones
 - Grand Mere State Park (2:30-3:15)
 - Warren Dunes State Park (3:15-4:00)
3. Group Reports to Planning Team (4:00-5:00)

Results from group exercise to be compiled into GMP statements of purpose and significance and will be distributed after meeting.

MEETING SUMMARY

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT RECREATION DIVISION

Grand Mere State Park – Warren Dunes State Park
General Management Plans – Planning Team Meeting #2

DATE: September 30, 2008

TIME: 2:00 – 5:00 pm

PLACE: Lake Township Hall (3220 Shawnee Rd., Bridgman)

Attendees: David Price, Rob Corbett, Paul Curtis, Joe Strach, Jeff Johnson, Paul Yauk, Carol Skillings, Janet Canode, Ray Fahlsing, Drew Montgomery, Mike Terrell, David Birchler, Jill Bahm

1. Brief Review of Background Analysis for GMSP & WDSP

David Birchler summarized the background analysis to date. A few corrections to the slides will be made.

2. Discussion of Core Values & Preliminary Identification of Management Zones

Attendees were divided into two groups and discussed each of the two parks. Their ideas and observations resulted in the suggestion of specific management zones for the parks.

3. Group Reports to Planning Team

Warren Dunes State Park

- This park has significant recreational opportunities for visitors, including a beach, an accessible sand dune, camping, hiking and the clay pits along the Painterville Creek; these areas should be identified as Developed Recreation
- The park headquarters and campground office should be identified as Visitor Services
- Due to the nature of the critical dune area between the beach, campground and the sand mine, this area should be identified as Primitive and/or Backcountry
- A Scenic Overlay is suggested at the top of the dune above the beach and the beach parking lot (for sunset viewing)
- It should be noted that Painterville Creek is a designated county drain
- An activist group is interested in expanding the currently designated natural area. It should be noted that in a designated natural area, no machines are permitted, except for rescue. Consider excluding the shoreline from natural area designation to allow DNRE maintenance machines to move along the beach area.

- Weko Beach (owned by Bridgman Township) to the north of WDSP is a popular beach in the area, covering 42 acres and offering camping. A significant number of Weko Beach patrons gain access to WDSP beach without paying the park entrance fee that supports operations.

Grand Mere State Park

- GMSP is a rustic year-round day-use park with considerable shoreline access to Lake Michigan and a unique ecology
- GMSP provides a great educational opportunity, showcasing the history of landforms and important natural communities such as mesic southern forest, mesic northern forest, dry mesic southern forest, mesic lakeplain prairie, open dunes and critical dunes
- Since most of the park is undevelopable and the majority of the park land is identified as a critical dune area, the bulk of the property should be identified as Primitive
- Particular attention should be given to the wet mesic lakeplain prairie in the northeast part of the park, which should be noted as a Environmentally Sensitive Zone Overlay
- A Natural Resource Recreation Zone should be considered along the entry road, the day use site, the old sand mine sites and the boat access site
- A Scenic Overlay should be considered along Lake Michigan and at two high points west of the area between Middle and South lakes.

Wrap Up: The management zone maps will be drafted based on the comments from today's meeting. At the next planning team meeting, the zones will be reviewed along with statements of Core Values for the parks.

A G E N D A

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT
RECREATION DIVISION
Grand Mere State Park – Warren Dunes State Park
Warren Woods State Park
General Management Plans – Planning Team Meeting #3

DATE: December 11, 2008
TIME: 1:00 – 4:00 pm
PLACE: Plainwell Operations Center
621 N. 10th Street , Plainwell, MI 49080

Lunch will be available at noon with Holland & Saugatuck staff

1. Review & Finalize the Management Zones for each park (1-2 p.m.)

Please review the attached map composites prepared from your comments at the September Team Meeting

2. Discussion of Statements of Purpose and Significance for each park (2-3 p.m.)

Please review the first few pages of the attached draft chapter

3. Identification of Key Stakeholders (3-3:30 p.m.)

Please bring names and contact information of those you would recommend and help us brainstorm other that should be invited into the management planning process

4. Review of Warren Woods – Paul Curtis (3:30 p.m.- 4 p.m.)

Meeting Summary
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT
RECREATION DIVISION
Grand Mere State Park – Warren Dunes State Park
Warren Woods State Park
General Management Plans – Planning Team Meeting #3

DATE: December 11, 2008
TIME: 1:00 – 4:00 pm
PLACE: Plainwell Operations Center
621 N. 10th Street , Plainwell, MI 49080

In attendance: David Price (FMD), Carol Skillings (RD), Janet Canode (OMET), Kim Dufresne (FMD), Kayla Krajniak (student), Glenn Palmgren (RD), Mark MacKay (WLD), Paul Curtis (RD), Mike Terrell (RD-WDSP), Rollie Johnson (RD-Plainwell), Brian Gunderman (FISH), Steve Chadwick (WLD), Jay Wesley (FISH), Jill Bahm, David Birchler

Review & Finalize the Management Zones for each park

Warren Dunes:

- Expand the dedicated natural area through all the noted Primitive Zone, except the portion noted as Developed Recreation, shown in the current natural area; the proposed boundary change will show the creek as the boundary adjacent to the primitive camp (Glenn will verify).
- The Natural Resource Recreation zone will be modified to be adjacent to the critical dune boundary.
- The text should acknowledge that the designated zones will continue to support the active uses within the park.
- It was noted that the City of Bridgman has a trail at the north end, at Weko Beach, down the highway to the Warren Dunes parking lot; it may be possible to connect within the park further north. The city may be interested in connecting to the park's old church camp.

Grand Mere:

- It was suggested that the Natural Area designation be expanded to include the dry mesic southern forest area.
- The Natural Resource Recreation Zone allows for development of universally accessible trails because it is an old roadbed.

Warren Woods:

- The natural communities include mesic southern forest.
- The entire park should be designated as Primitive Zone; however, the natural area should not be proposed for expansion at this time.
- It should be noted that the lease terms for the property require opportunities be provided within the park for educational uses.

Discussion of Statements of Purpose and Significance for each park

- Warren Dunes: Mike Terrell will send the shape file containing the graphic representation of the leased portion of the park. This will be added to the section on legal mandates. Additional language regarding the elemental occurrences of sand and gravel beach, mesic southern forest, interdunal wetlands, and open dunes will be included. The number of visits will be verified and a statement that the park “is a significant source of revenue for the park system” will be added. Hang-gliding will be noted as a unique activity. Very significant migratory bird resource. Most diverse staff and users in State Park System. Purpose of park is lake access and recreation.
- Grand Mere: The first three points will be combined. Notes about the elemental occurrences of (high-quality) dry mesic southern forest and the disjunct (relic) northern forest community will be added. Historically the lakes were farmed as a cranberry bog. Strengthen the point that sand mine restoration efforts are an educational and an industry model. It will also be noted that the relatively undeveloped area and natural setting provide a unique recreation opportunity. A statement that the park provides a great opportunity for waterfowl hunting will also be added. Prime example of the natural progression of lakes (2 of original 5 are now cedar swamp).

Identification of Key Stakeholders

- The team brainstormed a list of stakeholders for both parks; additional research into contacts will be completed by the team.

Review of Warren Woods – Paul Curtis

Comments:

- The natural communities include untouched, old growth mesic southern forest.
- The management zone for the entire park will be Primitive.
- It was decided by the planning team to consider expanding the dedicated natural area at a later date.
- The property is currently under lease by the State and the lease terms require educational components for the property.
- The bridge over the river is a requirement of the State’s lease, however, it could be considered in conflict with the Natural Area designation.
- Significance:
 - A portion of the park has a National Natural Landmark designation.
 - The park contains “A” rank for 98 acres of mesic southern forest and high-quality floodplain. The floor of both promotes growth of other species not found in the rest of Michigan.
 - Seasonal fishing for walleye, steelhead and coho salmon are found in the Galien River, which runs through the park.
 - River runs through lacustrine sand, which contributes, to its constantly changing route.
 - Park supports variety and unique concentration of flood plain bird species.
 - The park provides unique opportunities to view bird species, including the Louisiana Warbler, which is found within this park.

Recommendations to Approve

- November 30, 2009 RD Section Chiefs
- December 9, 2009 Citizen's Committee for Michigan State Parks
- December 15, 2009 Southern Lower Peninsula – Ecoteam
- December 15, 2009 RD Management Team
- February 2, 2010 Statewide Council

Appendix D

Edward K. Warren Foundation Lease

The lease agreement between the State of Michigan and the Edward K. Warren Foundation follows.

L E A S E

Whereas, the premises herein described were conveyed to and now are the property of The Edward K. Warren Foundation upon the following conditions:

Said premises are to be held in perpetuity by said Corporation, "The Edward K. Warren Foundation", as a theater for the recreation and the education of the people of the State of Michigan and elsewhere; and the Forest and River Portions thereof shall be preserved by the said grantee, FOREVER, in their primeval state as an exhibit and laboratory of nature for the education, entertainment and inspiration of future generations, embodying the creative power of Almighty God; and said premises are designated and shall be FOREVER known as "WARREN WOODS". In no event shall any timber, land or land area be sold. In the event the purposes of the donor in the establishment and maintenance of said Edward K. Warren Foundation shall, for any reason, fail in the said purposes then, in that event, it is understood that said property hereby conveyed and all thereof shall revert to the heirs of my body.

Now therefore, in performance of and in conformance with these conditions, it is hereby agreed, between THE EDWARD K. WARREN FOUNDATION, a corporation organized and existing under the laws of the State of Michigan, party of the first part, and THE STATE OF MICHIGAN, the party of the second part, as follows: The said party of the first part, in consideration of the rents and covenants herein specified, does hereby Let and Lease to the said party of the second part, the following described premises, situated and being in the Township of Chikaming, County of Berrien, State of Michigan, to-wit:

All of the West half of Section 27, Town 7 South Range 20 West, Chikaming Township, Berrien County, Michigan, except public highways, and also excepting therefrom that part of the Northeast 1/4 of the Northwest 1/4 of said Section 27 lying North of the highway that traverses the Northeast 1/4 of the Northwest 1/4 of said Section 27.

For the term expiring November 23rd, 2037, A.D. to be used as a theater for the recreation and the education of the people of the State of Michigan and

LESS 112 PAGE 485

elsewhere; and the Forest and the River Portions thereof shall be preserved by the said grantee, FOREVER, in their primeval state as an exhibit and laboratory of nature for the education, entertainment and inspiration of future generations, embodying the creative power of Almighty God; and the said premises are designated and shall be FOREVER known as "WARREN WOODS"; And to be occupied and used by the State of Michigan and the public for State Park purposes and administered and governed in accordance with the statutes, rules and regulations applicable thereto, subject, however, to the limitations and restrictions herein; Provided, that if default shall be made in any of the covenants herein contained, then it shall be lawful for the said party of the first part, its certain attorney, representatives and assigns, to re-enter into, repossess the said premises, and the said party of the second part, and each and every other occupant, to remove and put out. And the said party of the second part does hereby hire the said premises for the term as above mentioned, and does covenant and promise to pay to the said party of the first part, its representatives and assigns, for rent of said premises the sum of One Dollar and other valuable considerations in hand paid, the receipt whereof is hereby acknowledged, and as a further consideration for this lease, the second party is to keep and perform all the covenants and conditions herein set forth, and observe the restrictions and limitations herein set forth.

It is further agreed and understood that said lands and premises are now exempt from general taxes under the provisions of the laws and statutes of the State of Michigan, and in the event any general or special taxes, or any special assessment of any kind, should be levied against said lands and premises during the term of this Lease, same shall be paid by the second party.

It is further agreed and understood that the said second party will, at all times, maintain suitable and proper toilet rooms, rest rooms,

LIBER 112 PAGE 486

shelter, parking areas, and comfort stations to accommodate the public, as second party may allow the public to use said lands and premises. And, in this connection, it is expressly agreed and understood that at all times second party shall keep said lands open for the use of the public for the purposes herein mentioned.

It is further agreed and understood that at all times second party shall properly police said lands and premises so as to amply protect the trees, shrubbery, vines, fauna and flora thereon and to properly maintain peace and good order.

It is further agreed and understood that, notwithstanding any of the conditions contained in this Lease, the collecting Botanical and Ornithological specimens from said lands may be allowed only upon obtaining the written consent of both parties hereto.

It is further agreed and understood that at the termination of this Lease, all buildings and improvements of every kind and nature which may have been constructed on said lands and premises by the second party shall be left thereon, and the title thereto shall become vested in first party.

Said party of the second part further covenants that it will not assign nor transfer this Lease, nor sub-let said premises or any part thereof, without the written assent of said party of the first part, provided that said second party may lease such concessions and public service privileges as may be required for the proper administration of the area.

And also, that said party of the second part, will at its own expenses, during the continuance of this lease, keep the said premises and every part thereof in as good repair, and at the expiration of the term, yield and deliver up the same in like condition as when taken, reasonable use and wear thereof and damage by the elements excepted.

LIBRARY 112 PAGE 487

Second party further covenants that in no event shall any timber, land or lands area be sold or removed from said premises nor shall any hunting or gathering of herbs or taking of fauna or flora from said premises be allowed on said premises except as above provided and [that wherever *omit* possible and whenever possible there shall be a reforestation and replanting of barren and sparsely wooded portions of said premises,] provided however, that additional paths to facilitate the better enjoyment of these premises for the purposes hereinabove set forth, shall be developed and constructed by second party. Second party further covenants that it will not allow camping, nor the erection of camp-sites or lodging places nor entry of any but pedestrians in the wooded section of the premises herein leased, as said wooded section is indicated in the attached map of these premises which map is marked "Exhibit A" and made a part hereof.

And the said party of the first part does covenant that the said party of the second part, on performing all the conditions and covenants aforesaid, shall and may peacefully and quietly have, hold and enjoy the said demised premises for the term aforesaid.

The covenants, conditions and agreements, made and entered into by the several parties hereto, are declared binding on their respective representatives and assigns.

In witness whereof, the parties have hereunto, set their hands and seals this 9th day of April, 1949.

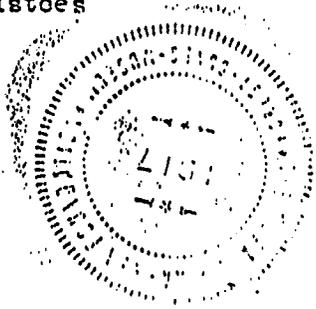
Witnesses:

Theron D. Childs, Jr.
Theron D. Childs, Jr.
Jane Krone
Jane Krone

THE EDWARD K. WARREN FOUNDATION

by Fred P. Warren
Fred P. Warren, Chairman of the Board of Trustees

by Lena VanGenderen
Lena VanGenderen, Secretary of the Board of Trustees



Witnesses:

Jane Bower
Jane Bower
M. Irene Gorsline
M. Irene Gorsline

DEPARTMENT OF CONSERVATION
FOR THE STATE OF MICHIGAN

By P. J. Hoffmaster *F-13*
P. J. Hoffmaster, Director

State of Michigan)
) ss.
Berrien County)

On this 9th day of April, 1949, before me a Notary Public within and for said County, personally appeared Fred W. Warren and Lena VanGnderen to me personally known, who, being by me duly sworn, did each for himself say that they are respectively the Chairman of the Board of Trustees and Secretary of the Board of Trustees of The Edward K. Warren Foundation, the Corporation named in the foregoing instrument, and that the seal affixed to said instrument is the corporate seal of said Corporation; and that said instrument was signed and sealed in behalf of said Corporation by authority of its Board of Directors; and said Fred P. Warren, Chairman of the Board of Trustees and Lena VanGnderen, Secretary of the Board of Trustees acknowledged said instrument to be the free act and deed of said Corporation.

June Krone
June Krone
Notary Public, Berrien County,
Michigan

My Commission Expires Feb. 8, 1952

State of Michigan)
) SS
County of Ingham)

On this 25th day of March, A.D. 1949, before me, a Notary Public in and for said county personally appeared P. J. Hoffmaster, Director of the Department of Conservation for the State of Michigan, to me known to be the same person who executed the within instrument, and who acknowledged the same to be his free act and deed and the free act and deed of the Department of Conservation for the State of Michigan in whose behalf he acts.

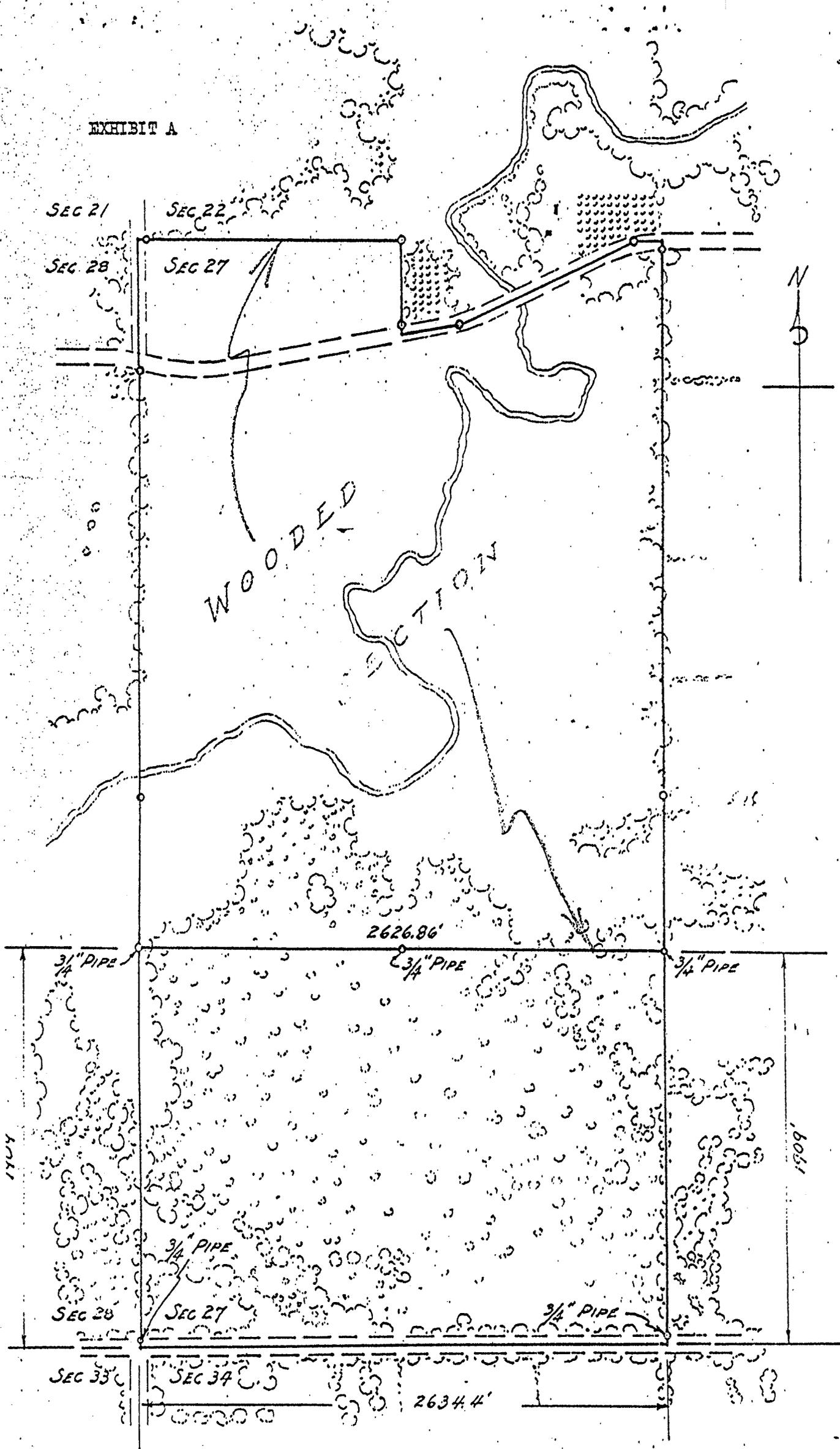
M. Irene Gorsline
M. Irene Gorsline
Notary Public, Ingham County
Michigan

My Commission Expires May 28-1951

RECEIVED FOR RECORD 4-21-49 at 8:40 AM

Catherine Weber
Register of Deeds,
Berrien Co., Mich.

EXHIBIT A



WARREN WOODS

IN

IT IS HEREBY AGREED, Between THE EDWARD K. WARREN FOUNDATION,

a Corporation organized and existing under the laws of the State of Michigan, party of the first part, and THE STATE OF MICHIGAN, the party of the second part, as follows: The said party of the first part, in consideration of the rents and covenants herein specified, does hereby Let and Lease to the said party of the second part, the following described premises, situated and being in the Township of Lake, County of Berrien, State of Michigan, to-wit:

78.86 ac
690 ft
The South Fractional Half of the Southwest Fractional Quarter of Section 24. 78.86 ac.

60 ac
120.7 ac
450.3 ft
The Northeast Quarter of the Northwest Quarter of Section 25, and the South Half of the Southwest Quarter of the Northwest Quarter of Section 25. 20.00 ac

The North Fractional Half, and the North Half of the South Fractional Half of Section 26. 57.12 ac

All in Township 6 South, Range 20 West, in all Two Hundred Twenty and eighty-six hundredths (250.86) acres, more or less:

for the term of ninety-nine years from date hereof, on the terms and conditions hereinafter mentioned, to be occupied and used by the State of Michigan and the public for state park purposes and administered in accordance with the statutes, rules and regulations applicable thereto, subject, however, to the limitations and restrictions hereinafter set forth.

Provided, that if default shall be made in any of the covenants herein contained, then it shall be lawful for the said party of the first part, its certain attorney, representatives and assigns, to re-enter into, repossess the said premises, and the said party of the second part, and each and every other occupant, to remove and put out. And the said party of the second part does hereby hire the said premises for the term of ninety-nine years (99), as above mentioned, and does covenant and promise to pay to the said party of the first part, its representatives and assigns, for rent of said premises the sum of One Dollar and other valuable considerations in hand paid, the receipt whereof is hereby acknowledged.

As a further consideration for this Lease, the second party is to keep and perform all the covenants and conditions hereinafter set forth, and observe the restrictions and limitations hereinafter set forth.

It is understood and agreed that all of said lands were conveyed

to the first party by Edward K. Warren in his lifetime, and said lands are now known as the "Warren Dunes," and hereafter the name "Warren" shall be used in all signs and advertising matter in any way relating to said lands.

It is further expressly agreed and understood that said lands and premises shall be operated as a public park, and that no cutting or removal of trees or shrubs, no removal of sand, gravel, or soil, no construction of roads, and no construction of buildings for permanent camps or amusement places will be permitted on or from the lands or premises, or the adjacent waters, except as may be necessary for the proper development, improvement, and maintenance of the lands for their proper use for state park purposes.

It is further agreed and understood that said lands and premises are now exempt from general taxes under the provisions of the laws and statutes of the State of Michigan, and in the event any general or special taxes, or any special assessment of any kind, should be levied against said lands and premises by the second party, or any taxing body, during the term of this Lease, same shall be paid by the second party.

It is further agreed and understood that the said second party will, at all times, maintain suitable and proper toilet rooms, rest rooms, comfort stations and bath houses to accommodate the public, as second party may allow the public to use said lands and premises. And, in this connection, it is expressly agreed and understood that at all times second party shall keep said lands open for the use of the public for the purposes herein mentioned.

It is further agreed and understood that at all times second party shall properly police said lands and premises so as to amply protect the trees, shrubbery and vines thereon, and to properly maintain peace and good order.

It is further agreed and understood that the New First Congregational Church of Chicago, Illinois, has a certain agreement and lease with the first party, dated July 1, 1920; and that said lease has been exhibited to the second party, and this lease is made subject to the terms and conditions of said lease between first party and the said New First Congregational Church of Chicago, Illinois.

It is further agreed and understood that, notwithstanding any of the conditions contained in this lease, the Museum Division of the Edward K. Warren Foundation shall have the exclusive right of collecting botanical and

ornithological specimens from said lands and premises at all times.

It is further agreed and understood that at the termination of this lease, all buildings and improvements of every kind and nature which may have been made on said lands and premises by the second party shall be left thereon, and the title thereto shall become vested in first party.

It is further agreed and understood that this lease cancels and supercedes a former lease covering these same lands executed by both parties hereto and dated December 31, 1929.

Said party of the second part further covenants that it will not assign nor transfer this lease, or sub-let said premises, or any part thereof, without the written assent of said party of the first part, provided that said second party may lease such concessions and public service privileges as may be required for the proper administration of the area for public park use.

And Also, that said party of the second part, will at its own expense, during the continuance of this lease, keep the said premises and every part thereof in as good repair, and at the expiration of the term, yield and deliver up the same in like condition as when taken, reasonable use and wear thereof and damage by the elements excepted.

And the said party of the first part does covenant that the said party of the second part, on performing all the conditions and covenants aforesaid, shall and may peacefully and quietly have, hold and enjoy the said demised premises for the term aforesaid.

The covenants, conditions and agreements, made and entered into by the several parties hereto, are declared binding on their respective representatives and assigns.

In witness whereof the parties hereto have set their hands and seals as of November 23, 1938.

ATTEST:

Louis Van Genderson
Secretary

ATTEST:

Wayland Osgood

THE EDWARD K. WARREN FOUNDATION

By J. W. Chamberlain
President

THE STATE OF MICHIGAN - DEPARTMENT OF CONSERVATION

By P. J. Hoffmaster
P. J. Hoffmaster, Director