



Ottawa County

Request for Proposal 24-078 Rosy Mound Natural Area Master Plan

The County of Ottawa, on behalf of Ottawa County Parks and Recreation Commission (OCPRC), is requesting proposals from experienced and qualified vendors for professional planning and design services to complete a master plan update for the Rosy Mound Natural Area in Grand Haven Township.

By responding to this RFP, the Proposer agrees to perform in accordance with the terms and conditions set forth herein.

RFP Issue Date:	Thursday, June 27, 2024
Questions Deadline:	Thursday, July 4, 2024
Addendum Issuance:	Tuesday, July 9, 2024
RFP Deadline:	By 2:00 PM (ET) Tuesday, July 16, 2024

RFP Administrator: Steven Holden, Procurement Specialist, 616-994-4778,
purchasing.rfp@miottawa.org

All requests for additional information or questions should be directed to the RFP Administrator.

Table of Contents

Request for Proposal 24-078.....	1
Section 1: Information Summary.....	3
Section 2: Background Information.....	5
Section 3: Scope of Work.....	6
A. Vendor Responsibilities	6
B. Proposal Requirements	7
Section 4: Proposal Selection and Award Process	8
Section 5: Contract Terms, Period, Procedures and Use.....	9
Section 6: RFP Terms and Conditions	10
Section 7: General Terms and Conditions.....	13

Exhibits:

Exhibit 1 – Rosy Mound Original Master Plan Report

Exhibit 2 – Existing Park Plan

Exhibit 3 – Acquisition Area

Exhibit 4 – Project Schedule

Exhibit 5 – Additional Information

Section 1: Information Summary

General Information:

The County of Ottawa distributes solicitation documents through the Michigan Intergovernmental Trade Network (MITN), website at <http://www.bidnetdirect.com/mitn> and through the Purchasing page of the County of Ottawa's website located at <http://www.miottawa.org/Departments/FiscalServices/bids.htm>. Copies of proposal documents obtained from any other sources are not considered official copies, and may result in failure to receive addenda, corrections or other revisions that may be issued.

For purposes of this RFP, the term "Contractor," "Vendor," "Proposer," "Respondent," or "Bidder" are considered to have the same meaning, all referring to the person or company responding to this RFP. Additionally, the terms "County," "Client," or "Owner" refers to the County of Ottawa.

Proposal Submission:

Proposals must be received by **2:00 PM (ET) on Tuesday, July 16, 2024** Proposals received after this time may not be considered. Proposals may be withdrawn at any time prior to the scheduled proposal deadline. Proposals must be firm and may not be withdrawn for a minimum period of 90 calendar days after the RFP Deadline. Proposals should be concise and complete, covering all items identified, emphasizing an understanding of the project and the resources to perform the intended work. Proposals will be reviewed to determine if submission requirements are met. Proposals that do not comply with submittal instructions established in this document and/or that do not include the required information may be rejected as non-responsive. Vendor assumes responsibility for meeting the submission requirements and addressing all necessary technical and operational issues to meet the project objectives.

All proposals must include completed, signed copies of all required attachments. Vendor assumes all risks associated with electronic submission (including possible technical issues). Proposals containing hyper-links to required response documents or required information (i.e. pricing, references etc.) may be disqualified. Attachments must be filled out in full and signed by an authorized Company representative.

Proposal Response:

Proposal response must contain completed, signed copies of each of the following required attachments:

- Attachment A – Cover Sheet for Proposal
- Attachment B – Vendor References
- Attachment C – Proposal Response

Proposals will be accepted by e-mail submission only, as follows:

Respondents will submit an electronic response (preferably single-file PDF format) by e-mail to: purchasing.rfp@miottawa.org with subject line of: “RFP 24-078 Rosy Mound Natural Area Master Plan.” The County can receive email attachments up to 25 megabytes. Proposal documents larger than 20 megabytes should be sent in multiple emails with subject line of: “RFP 24-078 Rosy Mound Natural Area Master Plan – 1 of 2”, etcetera. It will be the Proposers’ responsibility to ensure that their proposal have been appropriately delivered and received.

Modification:

Prior to the date and time set forth as the Proposal Receipt Deadline, proposals may be modified or withdrawn by the Proposer’s authorized representative. After the submission deadline, responses may not be modified or withdrawn without written consent of the County.

Pre-Proposal Conference:

“No pre-proposal conference scheduled”

Questions:

Vendors may submit questions and requests for clarification relating to this RFP to the RFP Administrator by the stated deadline. Responses to all questions and inquiries received by the County will be issued in the form of an Addendum and posted on the MITN and the County’s website, as needed. Only answers to questions submitted prior to the submission deadline and released in the form of an Addendum will be considered official and final. Any remarks or explanations made by phone, email, or in-person will be considered draft and will be non-binding.

Section 2: Background Information

County Information:

Beautiful Ottawa County is located in the southwestern section of Michigan's Lower Peninsula. Its western boundary is formed by Lake Michigan, and its eastern boundary is approximately 30 miles inland. The County landmass consists of a total area of 565 square miles with over 300 miles of water frontage. The County is composed of 6 cities, 17 townships, and 1 village.

The current County's legislative body is an eleven-member Board of Commissioners which is elected from single-member districts, determined by population, on a partisan basis for two-year terms. The Board of Commissioners provides oversight, establishes policy, and builds the strategic plan for County operations.

Ottawa County has been named the fastest-growing population in the state. Between 2010 and 2020, there was a 12.3% increase in population. The estimated population in the County in 2021 was 299,157. This significant population growth is expected to continue in the years ahead.

Section 3: Scope of Work

The Ottawa County Parks and Recreation Commission (OCPRC) is seeking professional planning and design services to complete a master plan update for the Rosy Mound Natural Area in Grand Haven Township. The original master plan (Exhibit 1), completed in 1991, guided efforts to develop park improvements and amenities on the original 164-acre lake-front parcel. Most of these improvements were completed in 2004, and the park has become one of Ottawa County's most well-known and loved parks (see Exhibit 2 for existing park facilities).

Ottawa County Parks is now nearing completion of the acquisition of an additional 127-acre property adjacent to the current park (Exhibit 3) with the intention of integrating the two properties and expanding the experiences provided at the existing park. With the new property's abundant natural features, scenic beauty, and a significant amount of disturbed land (over 50 acres), the site offers tremendous opportunities for recreation, connectivity, place-making, improved natural resource management, and restoration.

The process is intended to be completed in a six-month time frame as shown on the attached schedule (Exhibit 4) which allows for the plan to be the basis for a grant application to the Michigan Natural Resources Trust Fund in the spring of 2025.

Additional materials related to the property, including a rough concept prepared by Park Staff are included in Exhibit 5.

A. Vendor Responsibilities

Site Inventory & Analysis:

The awarded vendor will conduct a thorough site inventory and analysis of the new site's natural and man-made features including topography/slopes, vegetation, utilities, and other existing features along with analysis of these features as they relate to the opportunities or constraints that they place on any proposed park improvements. The results of this work should be recorded in graphic form and suitable for public presentation. It should be noted that a complete plant inventory of the site will be completed by others, with the results to be included in the final master plan report.

Concept Development:

After initial site analysis has been completed and based on discussions with Park staff and key invited stakeholders, the vendor will develop three plan alternatives for improvements to the newly acquired property. It is anticipated that these three plans would represent various levels of development from minimal impact to full utilization of

areas suitable for improvement. It is anticipated that these improvements would include improved existing trails, boardwalks and stairs as necessary to traverse steep slopes, paved trails for accessibility, parking, restrooms, and potentially indoor and outdoor group gathering and educational spaces. Other facility ideas may also arise through the planning process. Again, these concepts should be suitable for public presentation and input on desired features to be included in the final plan. It is proposed that this initial presentation to the public be in an open house type format with input gathered and recorded

Final Master Plan Development:

Following input from the public, Parks staff, and the Parks Commission, the vendor will prepare a preferred master plan drawing along with a detailed cost estimate of the proposed master plan improvements. This plan will be formally presented at a public meeting to receive public comment and the final plan adjusted as required. In addition, a final master plan report should be provided that describes the master plan the design process, and background key decisions

B. Proposal Requirements

Proposals should include the following information:

- A description of the vendor's experience in completing work of this type including examples and project references.
- A description of the proposed work plan for completing this project.
- A description of the proposed staffing (including resumes of employees assigned to this project).
- An outline of the professional fees for completing the work as described. Professional fees shall be on a not-to-exceed basis.
- An estimate of reimbursable expenses and a list of proposed reimbursable unit costs for items likely to be needed for this project.

Section 4: Proposal Selection and Award Process

An Evaluation Committee(s) will be established by the County to review the proposals and to make recommendation for contract award(s).

A Proposer may not contact any member of the Evaluation Committee except at the RFP Administrator's direction. Purchasing will notify vendors of relevant steps and status throughout the evaluation process.

Proposals will be evaluated based on the following criteria (of equal weight and in no particular order):

- Experience and Qualifications
- Past Projects
- Client/Customer References
- Proposal Response to Questions
- Costs and Fees Proposed
- Other Relevant Information

As part of the proposal evaluation process, the finalist vendor(s) may be invited to attend an in-person or virtual interview. The County reserves the right to interview any number of qualifying vendor(s) as part of the evaluation and selection process. The County reserves the right to award a contract without an interview, as determined in the best interest of the County.

The County of Ottawa reserves the right to select and subsequently recommend for award the proposal that best meets its required needs, quality levels, and budget constraints. The lowest priced response does not guarantee recommendation for contract award. The County reserves the right to award by item, group, or total proposal.

The Respondent to whom the award is made will be notified at the earliest possible date. Tentative acceptance of the proposal, intent to recommend award of a contract and actual award of the contract will be provided to the representative(s) designated in the proposal response.

Section 5: Contract Terms, Period, Procedures and Use

The County of Ottawa's intent is to award a contract that will cover the completion of the project from start to finish.

This contract will not be enforced until both parties have agreed and signed as accepted. The Vendor must execute and perform said Agreement.

The proposal, or any part thereof, submitted by the awarded vendor may be attached to and become part of the contract. Proposal pricing reflects a commitment to the terms indicated. As part of the contract negotiation process, the County reserves the right to delete or modify any task from the scope of services and reserves the right to modify the scope of services during the course of the contract. Any changes in pricing or payment terms proposed by the Vendor resulting from the requested changes are subject to acceptance by the County.

In the event that a successful agreement cannot be executed, the County reserves the right to proceed with contract negotiations with the other responsive, qualified vendors to provide service as referenced under negotiation process.

Contractors are not to start work until receipt of an Ottawa County Purchase Order, authorizing work to begin. The County's obligation will commence only following the parties' execution of the Contract and the County Board of Commissioners' approval. Upon written notice to the Contractor, the County may set a different starting date for the Contract. The County will not be responsible for any work done or expense incurred by the Contractor or any subcontractor, even if such work was done or such expense was incurred in good faith, if it occurs prior to the Contract start date set by the County.

This contract is for use only by the County, including departments, agencies, or courts of the County of Ottawa.

Section 6: RFP Terms and Conditions

By submitting a response, vendors confirm that they have read and will comply with the solicitation and all specified RFP terms and conditions listed below.

Cancellation of RFP:

The County may, at its discretion and if in the best interest of the County, cancel any proposal or request for proposal or other solicitation in whole or in part. The RFP Administrator will notify vendors of any cancellation.

Confidentiality:

All responses in entirety, produced by the Proposer, that are submitted to the County will become property of the County and may be considered public information under applicable law. Michigan FOIA requires the disclosure, upon request, of all public records; therefore, confidentiality of information submitted in response to this RFP is not assured.

Incurred Expenses:

The County will not be responsible for any cost or expense incurred by the proposers preparing and submitting a proposal or cost associated with meetings and evaluations of proposals prior to the execution of an agreement. This includes any legal fees for work performed or representation by the proposer's legal counsel during any and all phases of the RFP process, any appeal or administrative review process, and prior to County Board approval of a contract award.

Independent Contractor:

The awarded vendor will perform all work and services described herein as an independent contractor and not as an officer, agent, servant, or employee of Ottawa County. The vendor will have exclusive control of and the exclusive right to control the details of the services and work performed hereunder and all persons performing the same and will be solely responsible for the acts and omissions of its officers, agents, employees, contractors, and subcontractors, if any. No person performing any of the work or services described hereunder will be considered an officer, agent, servant, or employee of the County nor will any such person be entitled to any benefits available or granted to employees of the County.

Laws:

This RFP and subsequent contract will be governed by and construed in accordance with the laws of the State of Michigan and any service or product herein will so comply. All persons providing goods and/or services to Ottawa

County will comply with all applicable local, State and Federal laws, rules and regulations specifically including, but not limited to, State of Michigan Executive Orders.

Ownership of Data:

All information provided by the County and any reports, notes, and other data collected and utilized by the vendor, its assigned employees, and/or subcontractors, pursuant to any agreement resulting from this RFP, will become the property of the County as prepared, whether delivered to the County or not. Unless otherwise provided herein, all such data will be delivered to the County or its designee upon completion of any work performed or at such other times as the County or its designee may request.

Proposal Acceptance, Rejection, and Withdrawal:

The County also reserves the right to accept or reject any and all proposals submitted if in the best interest of the County.

The County reserves the right to negotiate with the Proposer(s) within the scope of the RFP. The County further reserves the right to award the contract to more than one Contractor, if in the best interest of the County to provide adequate delivery, services, and/or product availability. The County may request and require clarification at any time during the procurement process and/or require correction of arithmetic or other apparent errors for the purpose of assuring a full and complete understanding of a proposal and/or to determine a proposer's compliance with the requirements of the solicitation.

The County reserves the right to waive minor irregularities in proposals. Minor irregularities are defined as those that have no adverse effect on the outcome of the selection process by giving a Vendor an advantage or benefit not afforded to other Vendors. The County may waive any non-material requirements.

The County reserves the right to reject any or all proposals, or any part thereof; and to waive any minor defects in the proposals if this is to the advantage of the County. The County's waiver of a minor defect will in no way modify the RFP document or excuse the vendor from full compliance with its specifications if the vendor is awarded the contract. The County reserves the right to let separate contracts on any aspect of the work.

After the proposal deadline, proposals may not be withdrawn without the written consent of the County. Proposals must be firm and may not be withdrawn for a minimum period of 90 calendar days after the RFP deadline. Any fees proposed are considered firm and cannot be altered.

Retained Rights:

The County reserves the right to use ideas presented in reply to this process notwithstanding selection and rejection of proposals and/or bids. The County reserves the right to make changes to and/or withdraw this request at any time.

Subcontractors:

Since the contract is made pursuant to the proposal submitted by the awarded vendor and in reliance upon the vendor's qualification and responsibility, the vendor will not sublet or assign the contract, nor will any subcontractor commence performance of any part of the work included in the contract without the previous written consent by the County.

Section 7: General Terms and Conditions

By submitting a response, the Vendors confirm that they have read and will comply with all the general terms and conditions listed below.

Conflict of Interest:

By submission of a response, the Proposer agrees that at the time of submittal, they: (1) have no interest (including financial benefit, commission, finder's fee, or any other remuneration) and will not acquire any interest, either direct or indirect, that would conflict in any manner or degree with the performance of Proposer's services, or (2) will not benefit from an award resulting in a "Conflict of Interest."

Debarment and Suspension:

The Contractor certified to the best of its knowledge and belief, that the corporation, LLC, partnership, or sole proprietor, and/or its' principals, owners, officers, shareholders, key employees, directors and member partners: (1) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency; (2) have not within a three-year period preceding this form been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; (3) are not presently indicted for or otherwise criminally charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (2) of this certification; and, (4) have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Default

If Vendor defaults on the resulting contract, after the designated Cure Period, the County may do one or more of the following: (A) Exercise any remedy provided by law; (B) Terminate the resulting contract and any related contracts or portions thereof; (C) Impose liquidated and other damages; or (D) Suspend vendor from receiving future solicitations.

Equal Employment and Opportunity:

Every contract or purchase order issued by the County is entered into under provisions requiring the contract, subcontractor or vendor not to discriminate

against any employee or applicant for employment because of his/her race, religion, sex, color, national origin, height, weight, familial status, or disability that is unrelated to the individual's ability to perform the duties of a particular job or position.

Contractors and their subcontractors, as required by law, will not discriminate against the employee or applicant for employment with the respect to hire, tenure, terms, conditions or privileges of employment, or a matter directly relating to employment, because of race, color, religion, national origin, familial status, age, sex, height, weight, or disability that is unrelated to the individual's ability to perform the duties of a particular job or position. Breach of this covenant may be regarded as a material breach of the Contract.

The Vendor will adhere to applicable Federal, State and local laws, ordinances, rules and regulations prohibiting discrimination.

Force Majeure:

Neither party to the resulting agreement will be held responsible for delay or default caused by fire, flood, civil disobedience, court order, labor dispute, acts of God and/or war which is beyond that party's reasonable control. If either party is unable wholly or in part to carry out its obligations under any resulting agreement, then such party will give notice and full particulars of Force Majeure in writing to the other party within a reasonable time after occurrence of the event. Such non-performance will not constitute grounds for default.

Insurance:

Vendor agrees to indemnify, defend, and hold harmless the County from any and all liability arising out of or in any way related to the Vendor's performance of services related any Contract agreed to as a result of the RFP, including any liability resulting from intentional or reckless or negligent acts or the acts of the employees or agents of Vendor. Vendor will provide proof of the following coverages: worker's compensation, employer's liability, comprehensive general liability and if applicable, automobile, and professional malpractice. Coverage limits are to be statutory and if no statute is applicable, at least \$1,000,000 per occurrence or claim and \$2,000,000 aggregate. These limits may be provided in single layers or by combinations of primary and excess/umbrella policy layers. These coverages will protect the vendor, and County and their employees, agents, representatives, invitees, and subcontractors against claims arising out of work performed or products provided. The County and its elected officials, officers, employees, agents, and volunteers are to be additional insureds and a thirty-day notice is required to the County in the event of coverage termination.

Iran Linked Business:

Pursuant to State of Michigan, Iran Economic Sanctions Act, 2012 P.A. 517, MCL 129.311 seq., the Contractor certifies, under civil penalty or false certification, that it is fully eligible to do so under law and that it is not an “Iran linked business.”

Material Safety Data Sheets:

All County purchases require a Material Safety Data Sheet (MSDS) where applicable in compliance with MIOSHA “Right to Know” Law. Vendor will forward all relevant Material Safety Data Sheets to the designated County Representative upon request.

Payment Terms:

Payment terms will be Net 30 unless otherwise mutually agreed upon by all parties.

Right to Audit:

The Vendor will maintain such financial records and other records as may be prescribed by Ottawa County or by applicable federal and state laws, rules, and regulations. The Vendor will retain these records for a minimum period of three years after final payment, or until they are audited by the County of Ottawa, whichever event occurs first. These records will be made available during the term of the contract and the subsequent three-year period for examination, transcription, and audit by Ottawa County, its designees or other authorized bodies.

Safety:

All Contractors and Subcontractors performing services for the County are required to and will comply with all Occupational Safety and Health Administration (OSHA), State and County Safety and Occupational Health Standards and any other applicable rules and regulations. Also, all Contractors and Subcontractors will be held responsible for the safety of their employees and any unsafe acts or conditions that may cause injury or damage to any persons or property within and around work site area under this Contract.

Tax Exempt Entity:

The County is exempt from Federal Excise and State Sales Tax. Do not include such taxes in the proposal. The County will furnish the successful proposer with tax exemption certificate when requested.

Warranty:

Vendor warrants that the goods and/or services supplied will be good workmanship and material, free from defects, and if the intended use thereof is known to the

seller, that they are suitable for the intended use. Awarded vendor will transfer all applicable manufacturer warranties to the County and agrees to coordinate all claims on the County's behalf.

Exhibit 1 - Rosy Mound Original Master Plan Report

**ROSY MOUND
NATURAL AREA
MASTER PLAN**

OTTAWA COUNTY
ROSY MOUND NATURAL AREA
MASTER PLAN
SEPTEMBER 1991

**PLAN PREPARED WITH THE ASSISTANCE OF
THE MICHIGAN COASTAL MANAGEMENT PROGRAM
ADMINISTERED BY THE
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
LAND AND WATER MANAGEMENT DIVISION
IN COOPERATION WITH
THE NATURAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**

**PLANNING COOPERATION PROVIDED BY
OTTAWA COUNTY
PARKS AND RECREATION COMMISSION**

PLAN PREPARED BY:

M.C. SMITH & ASSOCIATES, INC.

Landscape Architecture • Park & Recreation Planning
Land Planning • Downtown Planning • Urban Design
529 Greenwood Avenue S.E. • East Grand Rapids, Michigan 49506
616-451-3346 • FAX 616-451-1935

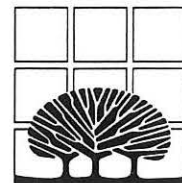


TABLE OF CONTENTS

Introduction

 Location

Site Inventory and Analysis

 Soils and Slopes
 Vegetation and Micro Climate
 Landforms/Hydrology
 Existing Features
 Site Utilization

Management Issues

 Visitor Control
 Boater Control
 Visitor Education
 Emergency Management
 Environmental Protection
 Environmental Rehabilitation
 Handicapped or Mobility-Limited Access
 Maximum Site Capacity
 Park Operations
 Restrooms and Associated Waste Disposal
 Trash Removal and Control

Master Plan

Cost Projections

Appendix

- A. "Vegetation and Wildlife Inventory for Rosy Mound Natural Area"
- B. Sand Dune Statutes

INTRODUCTION

INTRODUCTION

The purpose of this document is to identify a master plan for the proposed Rosy Mound Natural Area in Grand Haven Township of Ottawa County. The 164 acre Rosy Mound site is a privately owned site proposed for acquisition by the Ottawa County Parks and Recreation Commission as a future County Park. Negotiations for purchase of the property are currently in progress and no assurances have been given that the sale will indeed take place.

The Rosy Mound property was identified as a potential park site during preparation of the "1989 Ottawa County Park and Recreation Plan". Based on a needs assessment, the plan placed high priority on acquisition of additional Lake Michigan frontage and protection of fragile environmental areas in Ottawa County. With over 3,400 feet of pristine Lake Michigan shoreline, along with high-quality dunes and old growth forest, the Rosy Mound site clearly met the plan goals and was made top priority in the plan's action program. Acquisition efforts were begun shortly thereafter.

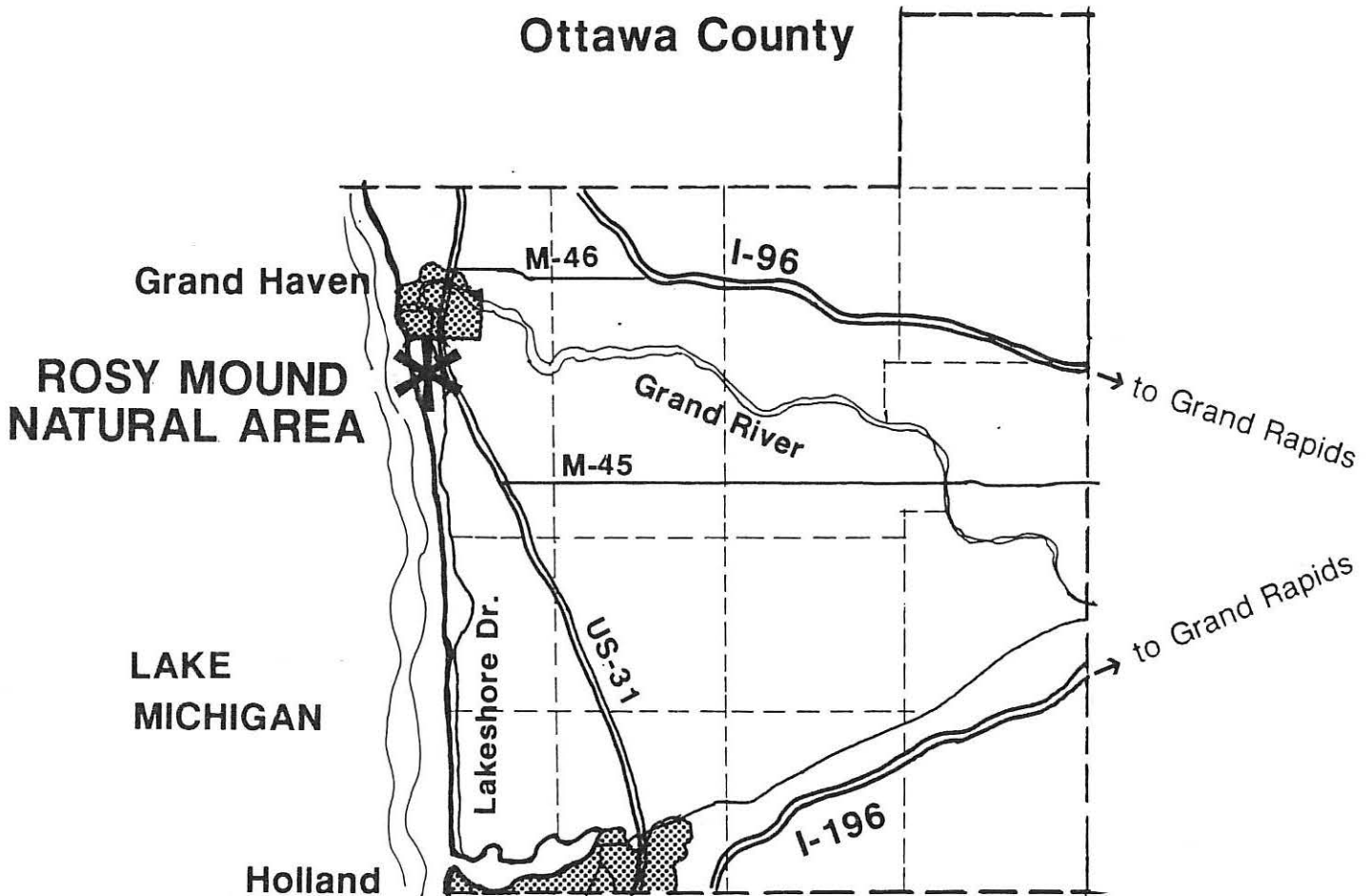
In planning the Rosy Mound Natural Area, the Parks Commission must consider two somewhat contradictory premises: 1) There appears to be rapidly growing and virtually unlimited public demand for recreation along the Lake Michigan shoreline, and 2) The outstanding natural features found at the site are very fragile, creating a need to carefully control the amount and type of use which occurs. A basic goal of the plan, therefore, will be to allow as much public use as possible without endangering the quality of the natural resources of the site.



Location

The proposed Rosy Mound Natural Area is located on Lake Shore Drive, 1 mile south of Grand Haven in Ottawa County, and 18 miles north of Holland. It is a short distance from US-31, a major divided highway running north and south along the Lake Michigan lakeshore.

The proposed site is part of Construction Aggregates property and is bounded by residential areas to the south and north. Scattered residential properties lie east of Lake Shore Drive and Lake Michigan forms the western edge.



REGIONAL LOCATION MAP



SITE INVENTORY AND ANALYSIS

SITE INVENTORY AND ANALYSIS

To determine the existing environmental and cultural forces which influence both the utilization and ecosystems of the shoreline, an environmental inventory and analysis was conducted. The findings of this analysis became an integral element in preparation of the Master Plan.

The natural systems of the shoreline are dynamic, intriguing and to be respected. In nearly every situation where man has imposed upon these sensitive and dynamic systems, the results have either been a continued battle to control the moving sand and gnawing waves or man's obliteration of the natural environment. By the careful assessment of the conditions and forces present today along the shoreline, the Master Plan has been developed to observe and respect the existing environmental conditions of the shoreline. Where man's influence has had, and continues to have, impacts on this environment the Master Plan proposes and provides the means for people to utilize the shoreline in a manner which will be compatible with the conservation of this resource.

The Inventory and Analysis includes documentation of the following: Slopes and Soils; Vegetation and Microclimates; Landforms and Hydrology; Existing Features; and Site Utilization. The findings of the Inventory and Analysis are presented both graphically and with explanatory notes by means of the plans which follow. A Site Utilization Plan presents in graphic form the proposed development and preservation zones which proceed from the analysis of the individual inventories.

Soils and Slopes

The entire site is composed of various types of sand. Lake Beach sand which is found paralleling and including the beach and foredune ridge; Deer Park sand found throughout the majority of the site and composing most of the dramatic dune formations; Rubicon sand found near the proposed Rosy Mound Natural Area entrance in the flatter and disturbed portions of the site; and blowout land composed of sands which have been exposed and moved by natural forces, primarily wind.

The slopes vary from nearly flat to extremely steep (25% and greater). The site has been divided into three slope categories which reflect the maximum and minimum slopes desirable for the different recreational activities proposed for the site.

The flat to moderate slopes (0.5%) are areas having few limitations (in terms of slope) to intensive developments (i.e. parking lots, buildings, play fields, etc.). The moderate to steep slopes (6-15%) are areas having limitations except for carefully controlled developments (i.e. trails, roads, picnicking areas, etc.). Slopes greater than 16% are regarded as severely limited for development except very carefully managed improvements (walks, trails). In addition, the Sand Dune Management and Protection Act prohibits developments in the critical dune areas which will disturb slopes over 25%. Nearly half of the site has slopes greater than 25%. Steeply sloped areas are found dividing the area adjacent to Lakeshore Drive and the area along Lake Michigan, making access between the two areas difficult without destroying the resource.

Vegetation and Microclimate

The vegetation inventory has been generated from a study performed by Leon Schaddelee for Ottawa County, titled "Vegetation and Wildlife Inventory for Rosy Mound Natural Area" (See appendix). It indicates the unique vegetative patterns of the Rosy Mound Natural Area. Large portions of the site are either covered with fragile grass communities or wooded areas typical of Lake Michigan dunes. Only the "front" or eastern section of the site has disturbed vegetative patterns.

The study also indicated areas of threatened plants (dune thistle) or of special significance due to size, age or geographic distribution.

The microclimate of this site is typical of Lake Michigan shoreline dune formations. The Lake acts as a temperature modifier for the coast line. Generally the open areas and dune faces are exposed, hot and dry areas, while the dune backsides are much cooler and moister.

Landforms/Hydrology

The Rosy Mound Natural Area is characterized by a low foredune (20'-40') back of a beach zone, and steep bluffs or primary dunes reaching as much as two hundred feet in height (above lake elevation). Along a large length of the shoreline, the foredune and primary dunes are dramatically separated by a relatively low flat area, composed of blow-out sands and vegetation of the Little Bluestem community. Particularly on the north and south ends of the shoreline, the foredune all but disappears and the steep primary dune rises up from the beach. The action of waves and wind causes noticeable erosion on the lake face of the dune during high lake levels. The back dune and trough areas are relatively stabilized with mixed deciduous and evergreen vegetation.

Runoff is limited on all parts of the site because of the porous sandy soils in exposed areas and the porous, loosely compacted leaf mulch over sandy soils in the stabilized, tree covered areas. There appear to be no areas of significant runoff.

Existing Features

The site evidences few significant man-made features, although it is surrounded by such residential developments to the north, south and east. The most significant feature is the massive sand mining operation to the northeast edges of the site. From the property lines, the mining operation is not visible at the current time, due to the site terrain. Of course, mining operations may visually encroach at some time in the future, as mining operations remove the large dunes adjacent to these site edges. However, this is not expected to happen in the near future, and such activity is controlled and monitored by state agencies to balance the needs of the mining operation and adjacent developments.

On-site, pedestrian and ORV movements have begun to create distinct foot paths into the site, with most noticeable disruption occurring in the area adjacent to Lakeshore Drive. Securing the site to restrict ORV use and development to guide pedestrian traffic will prevent resource damage.

Boaters anchoring off shore use the beach area due to its secluded and accessible nature. This is not envisioned as a problem as long as conflicts with swimmers and adjacent residents can be prevented.

To the very south of the site the remains (drive and garage) of a lakefront residence are perched on the lake side of the dune. The property has been abandoned due to the erosion caused by high water levels.

In the backdune area toward the south of the site, some areas have been selectively cleared by the current Owner recently with logging trails and slash/brush piles left. As the Vegetation and Wildlife Inventory points out, despite this detrimental activity, this represents an opportunity to educate visitors to the Natural Area about forest succession.

Wildlife of the site is not significant in terms of any unusual species of fauna. However, as the Vegetation and Wildlife Inventory points out, the "preserve is large enough to provide significant habitat for wildlife, especially important for those birds whose numbers are dwindling due to habitat loss,... The county should try to buy additional acreage on adjoining land, to protect even more habitat." Hikers and persons acquainted with the site have reported the presence of small animals (rabbits, squirrels, etc.), reptiles and deer.

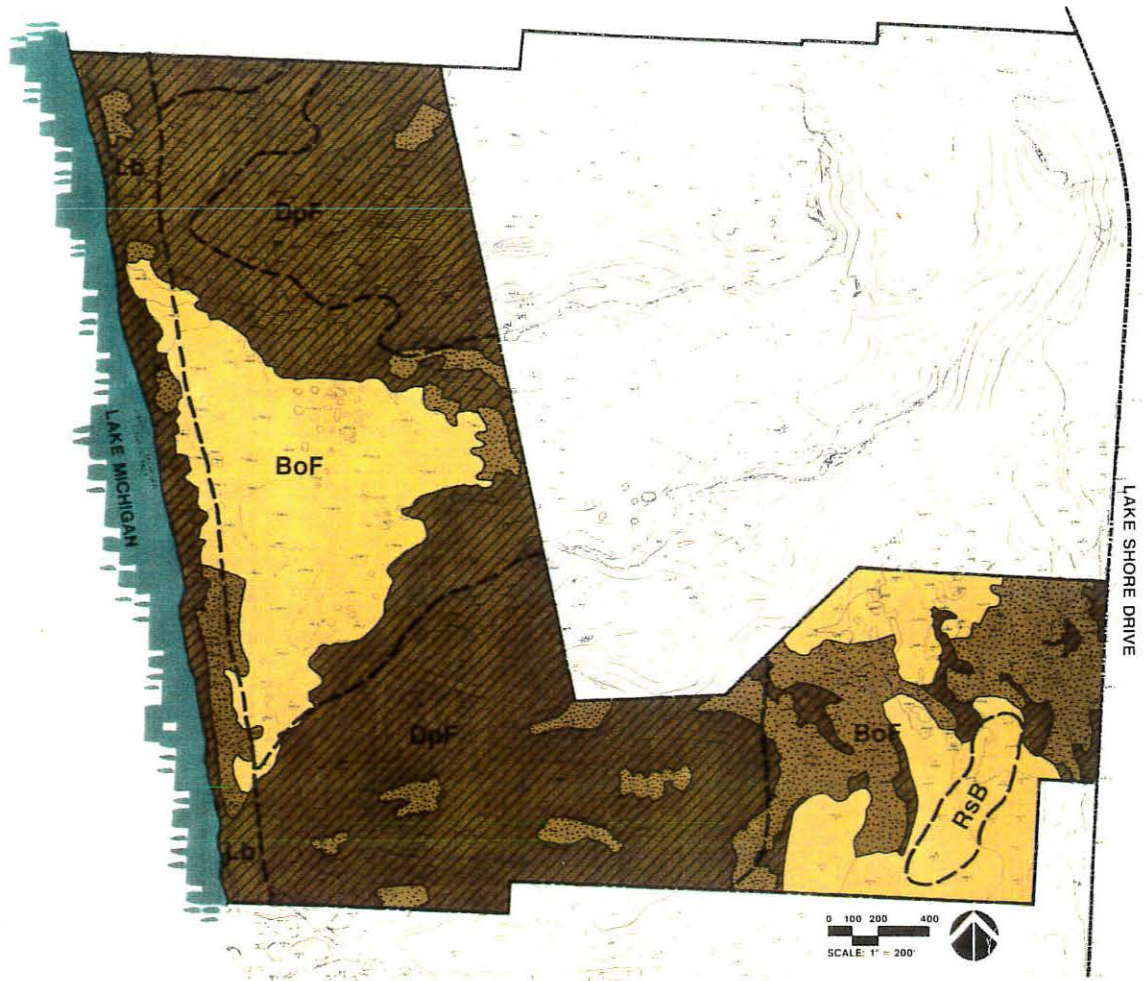
Generally, the site, with the exception of the occasional hiker, has remained fairly untouched and is an excellent example of a Lake Michigan dune formation and shoreline.

Site Utilization

The site has been divided into different zones for development, protection or education. The limits of these zones have been established based on the preceding site inventory/analysis elements in conjunction with the desired and essential activities expected to occur in this County Park.

As can be seen from the drawing, the areas of the intense development are limited to the front portions of the site. Restricted development corridors occur to and along the shoreline and into the site interior. The great majority of the site is left undeveloped and protected.

Any developments on this site must take into account the fragility of the resource, as well as development restrictions imposed by legislation, such as the Sand Dune Management and Protection Act.



LEGEND: SOILS AND SLOPES

BoF - BLOW-OUT LAND

WELL DRAINED SAND. LIMITED VEGETATION. VARIED SLOPES. EXPOSED AREAS. SUBJECT TO EROSION. SUITABLE FOR USES LIMITED TO RECREATION AND WILDLIFE HABITAT WHERE SLOPE LIMITATIONS ARE NOT A FACTOR.

DpF - DEER PARK SAND

WELL DRAINED SAND. LIMITED VEGETATION. SUSCEPTIBLE TO EROSION IN EXPOSED SITUATIONS. SUITABLE FOR LIMITED DEVELOPMENT WHERE SLOPE LIMITATIONS DO NOT EXIST.

Lb - LAKE BEACHES

GENERALLY LACKS VEGETATION. COARSE SHORELINE SAND. SLOPES RANGE FROM 0-15%. EXTREME DEVELOPMENT LIMITATIONS. IDEALLY SUITED FOR WATERFRONT RECREATION.

Rsb - RUBICON SAND

WELL DRAINED SAND. EXPOSED AREAS SUBJECT TO EROSION. SUITABLE FOR ALL KINDS OF DEVELOPMENT, INCLUDING RECREATIONAL FACILITIES.



SOIL BOUNDARY LINE



0-5% SLOPES

FLAT TO MODERATE SLOPES SUITABLE FOR A WIDE RANGE OF UTILIZATION.



6-15% SLOPES

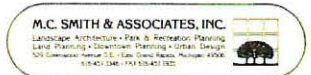
MODERATE TO STEEP SLOPES SUITABLE FOR LIGHT, CONTROLLED DEVELOPMENT IN SELECT AREAS DUE TO EROSION POTENTIAL AND POTENTIALLY STEEP GRADIENTS



16%-UP SLOPES

STEEP TO SEVERE SLOPES FOR MOST USES EXCEPT UNDER CAREFULLY DEVELOPED AND MANAGED CONDITIONS DUE TO VERY HIGH EROSIONS AND ACCESS AND CIRCULATION LIMITATIONS. SOME AREAS MAY REQUIRE SUPPLEMENTAL STABILIZATION MEASURES TO MITIGATE NATURAL EROSION.

**SOILS/SLOPES
INVENTORY AND ANALYSIS
ROSY MOUND NATURAL AREA
OTTAWA COUNTY PARKS AND RECREATION COMMISSION**

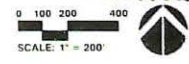
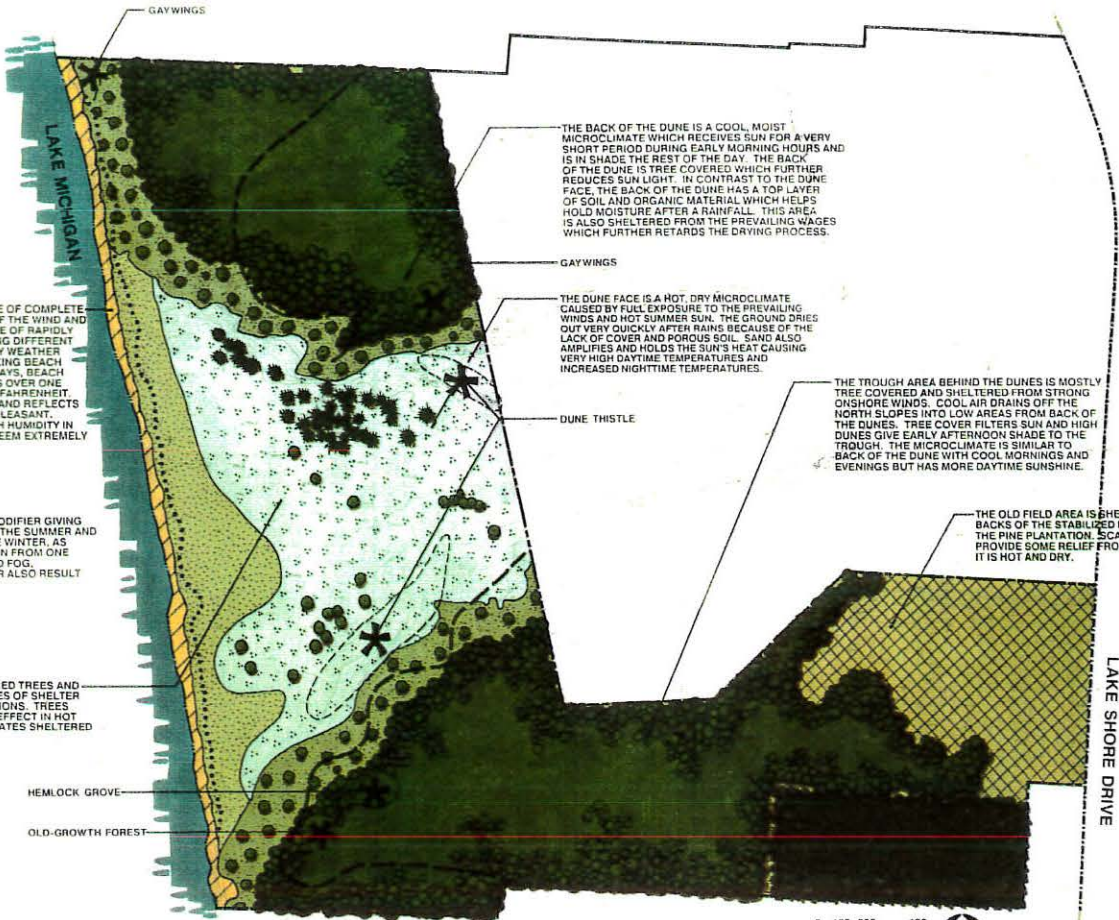




THE BEACH MICROCLIMATE IS ONE OF COMPLETE EXPOSURE TO THE INFLUENCES OF THE WIND AND SUN. THIS CREATES A WIDE RANGE OF RAPIDLY CHANGING TEMPERATURES DURING DIFFERENT TIMES OF THE DAY. DURING WINDY WEATHER SAND IS BLOWN BY THE WIND MAKING BEACH GOING MISERABLE. HOT SUNNY DAYS, BEACH SAND CAN REACH TEMPERATURES OVER ONE HUNDRED AND TWENTY DEGREES FAHRENHEIT. DURING COOL SUNNY DAYS THE SAND REFLECTS THE SUNS RAYS MAKING IT VERY PLEASANT. DURING COLD WEATHER, THE HIGH HUMIDITY IN THIS AREA CAN MAKE THE WIND SEEM EXTREMELY HARSH.

LAKE ACTS AS A TEMPERATURE MODIFIER GIVING COOLER TEMPERATURES DURING THE SUMMER AND MILD TEMPERATURES DURING THE WINTER. AS WELL AS SLOWING THE TRANSITION FROM ONE SEASON TO THE NEXT. INCREASED FOG, SNOWFALL AND CLOUDY WEATHER ALSO RESULT FROM THE LAKE INFLUENCE.

OPEN SAND AREAS WITH SCATTERED TREES AND GRASS COMMUNITY CREATE NODES OF SHELTER FROM CERTAIN WEATHER CONDITIONS. TREES PROVIDE SHADE AND A COOLING EFFECT IN HOT WEATHER AND TOPOGRAPHY CREATES SHELTERED AREAS IN WINDY WEATHER.



LEGEND: VEGETATION AND MICROCLIMATE

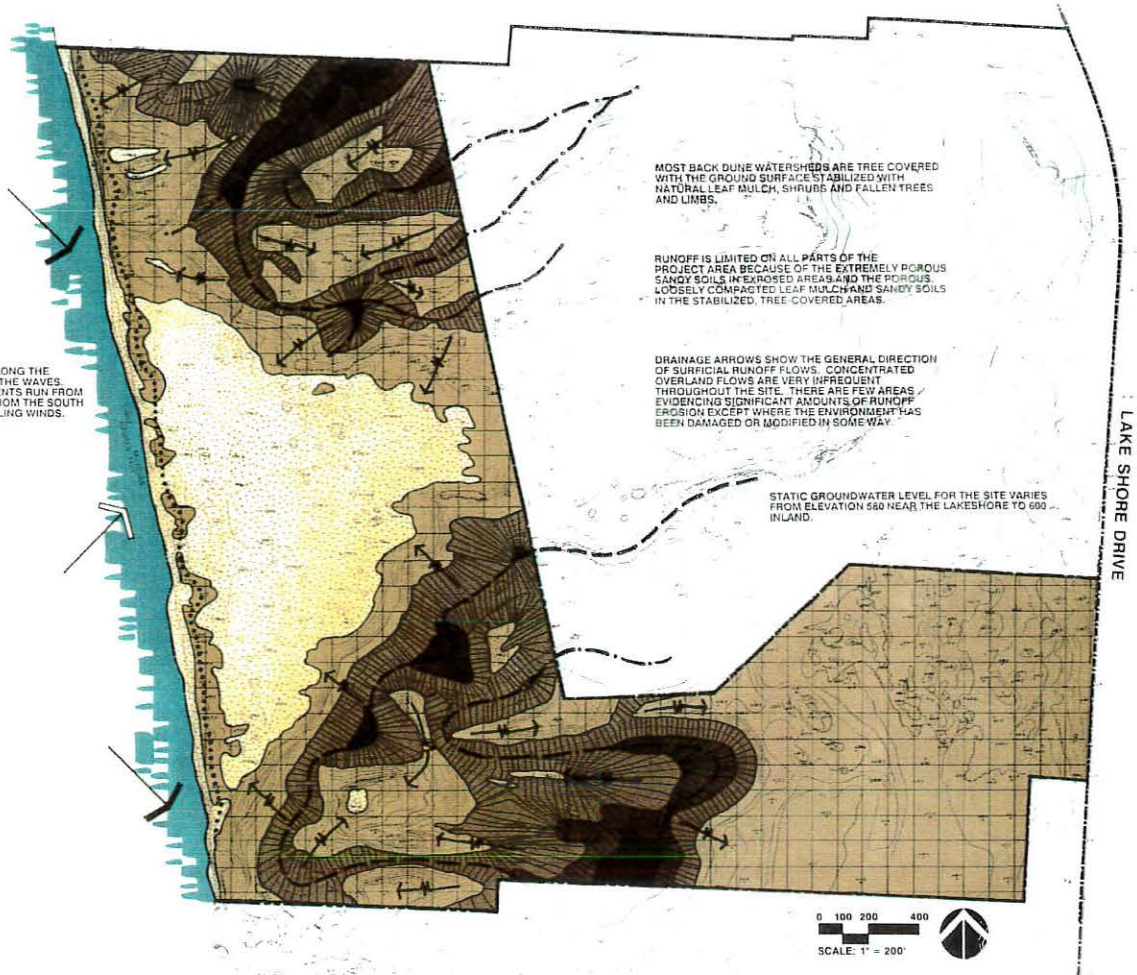
- OPEN SAND**
AREAS OF OPEN SAND WITH MINIMAL VEGETATIVE COVER.
- BEACHGRASS COMMUNITY**
AREAS OF AMERICAN BEACH GRASS WITH SPORADIC AREAS OF SAND CHERRY AND COTTONWOOD. LITTLE OTHER VEGETATION.
- LITTLE BLUESTEM COMMUNITY**
AREAS OF SCATTERED DECIDUOUS AND EVERGREEN TREES, ALONG WITH LOW GROWING GRASSES AND OTHER SPECIALIZED PLANT LIFE IN OPEN SAND AREAS.
- OAK TRANSITION COMMUNITY**
AREAS WHERE RED OAK DOMINATES A NARROW TRANSITIONAL COMMUNITY WHERE FOREST AND OPEN DUNE SPECIES MERGE. OTHER DECIDUOUS TREES AND UNDERSTORY VEGETATION ARE CHARACTERISTIC OF THIS AREA.
- MESIC FOREST**
AREAS WHERE DECIDUOUS AND EVERGREEN TREES DOMINATE THE LANDSCAPE. UNDERSTORY TREES AS WELL AS LOW-GROWING VEGETATION ARE PREVALENT.
- OLD FIELD**
AREA DISTURBED BY MAN'S ACTIVITIES AND MARKED BY OPEN SAND AREAS WITH SCATTERED GRASSES, SHRUBS AND INVASIVE TREES
- OLD PINE PLANTATION**
SINGLE SPECIES PLANTS WITH LIMITED UNDERSTORY.
- MAJOR RIDGE LINES**
- FOREDUNE RIDGE LINE**
- AREAS OF SPECIAL INTEREST**

**VEGETATION/MICROCLIMATE INVENTORY AND ANALYSIS
ROSY MOUND NATURAL AREA
OTTAWA COUNTY PARKS AND RECREATION COMMISSION**

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


LITTORAL DRIFT CARRIES SAND ALONG THE SHORELINE IN THE DIRECTION OF THE WAVES. GENERALLY, THE LITTORAL CURRENTS RUN FROM THE NORTH IN THE WINTER AND FROM THE SOUTH IN THE SUMMER WITH THE PREVAILING WINDS.

LAKE MICHIGAN
ELEVATION 582.5



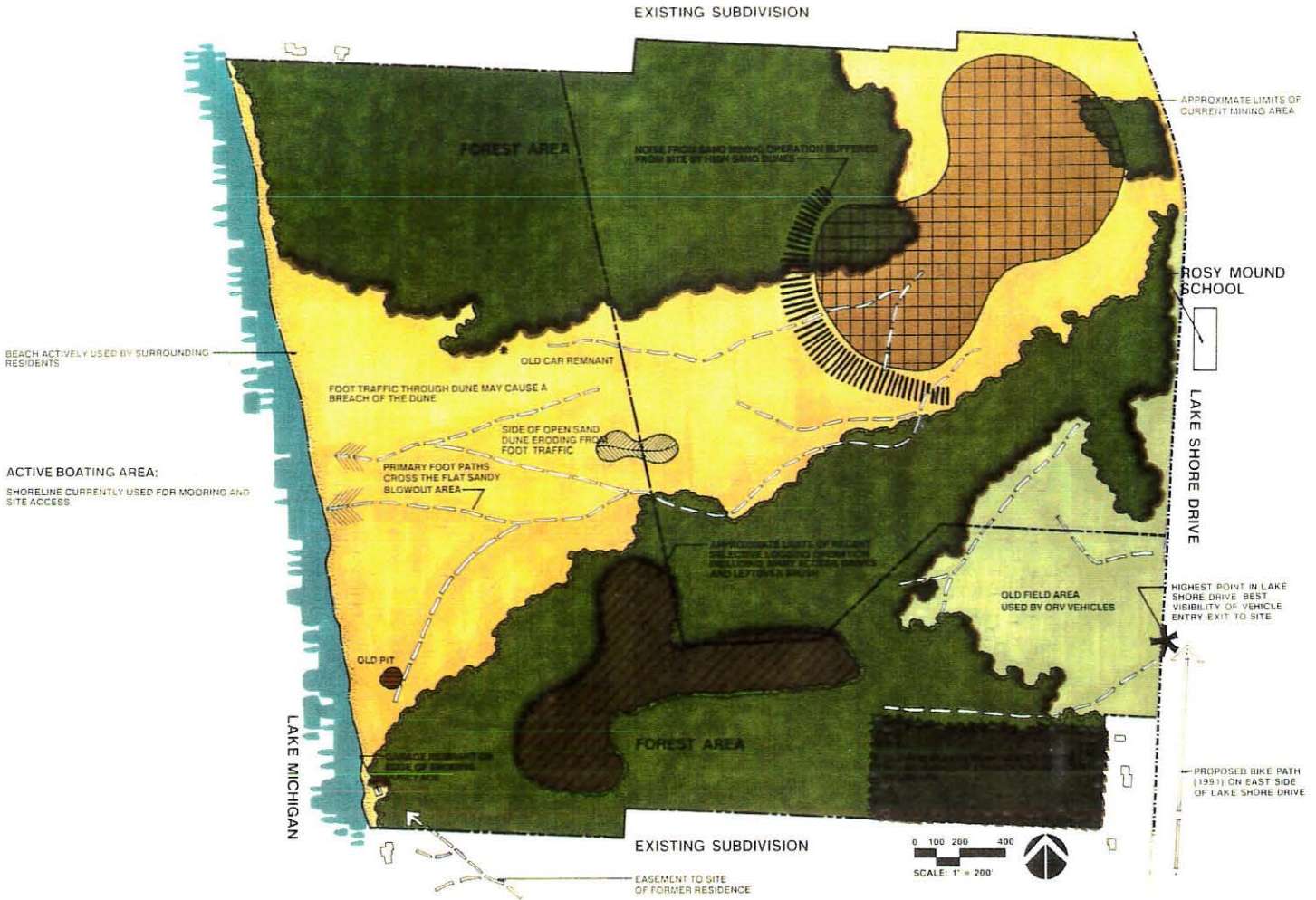
LEGEND: LANDFORMS/HYDROLOGY

-  LAKE LEVEL (580 FT. TO 600 FT.)
-  600 - 650 FT.
-  650 - 700 FT.
-  700 - 750 FT.
-  750 - 800 FT.

-  MAJOR RIDGE LINES
-  MINOR RIDGE LINES
-  FOREDUNE RIDGE LINE
-  DIRECTION OF SURFICIAL RUNOFF FLOW
-  DOMINANT LITTORAL DRIFT CURRENT

-  SECONDARY LITTORAL DRIFT CURRENT

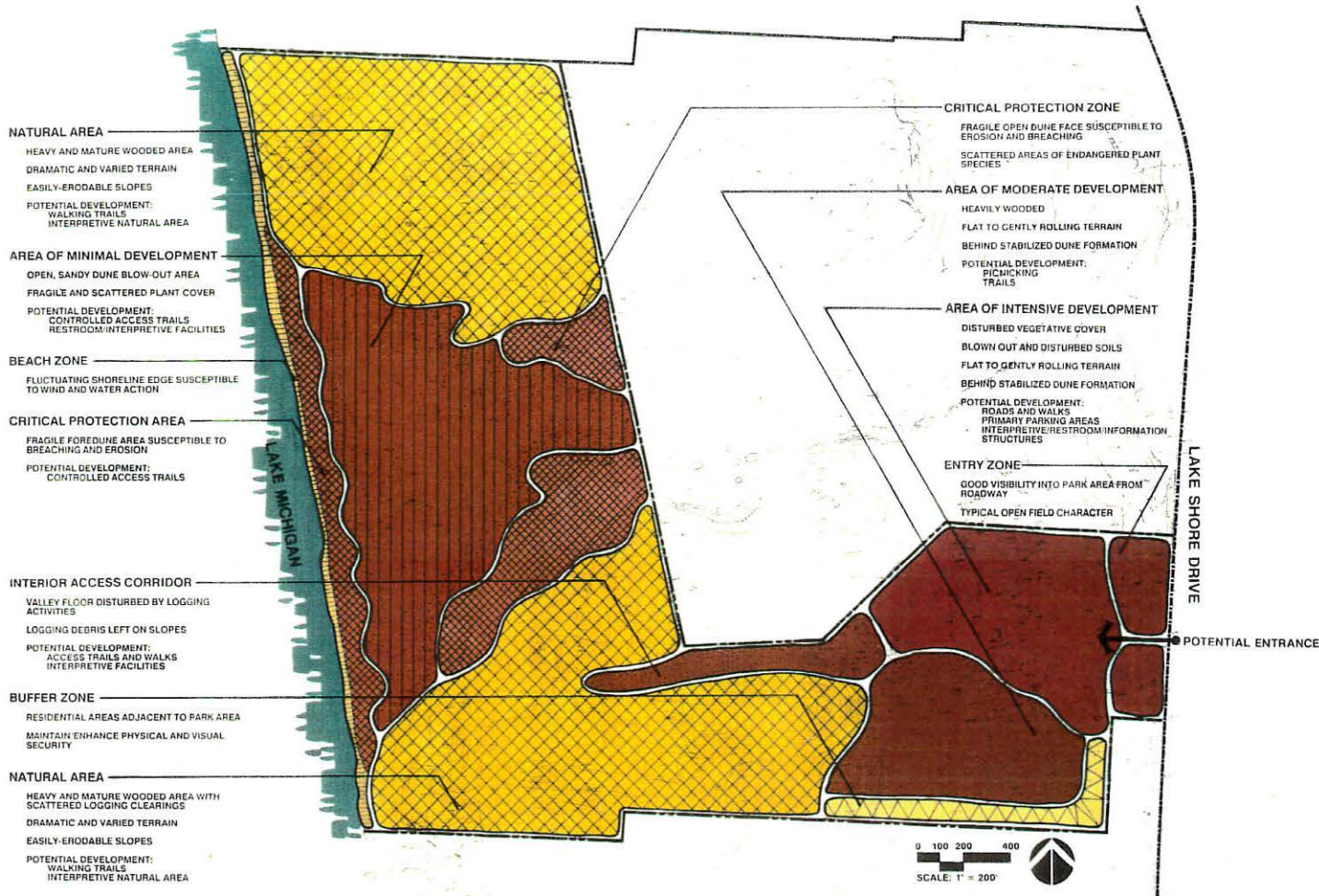
**LANDFORMS/HYDROLOGY
INVENTORY AND ANALYSIS
ROSY MOUND NATURAL AREA
OTTAWA COUNTY PARKS AND RECREATION COMMISSION**










LEGEND: EXISTING FEATURES

-  EXISTING HOMES
-  BEACH AREA
-  FOREST AREA
-  FOOT AND ORV TRAILS

**EXISTING FEATURES
INVENTORY AND ANALYSIS
ROSY MOUND NATURAL AREA
OTTAWA COUNTY PARKS AND RECREATION COMMISSION**



LEGEND: SITE UTILIZATION

-  AREA OF INTENSIVE DEVELOPMENT
-  AREA OF MODERATE DEVELOPMENT
-  AREA OF MINIMAL DEVELOPMENT
-  CRITICAL PROTECTION ZONE
-  BEACH ZONE
-  BUFFER ZONE
-  NATURAL AREA

SITE UTILIZATION

ROSY MOUND NATURAL AREA
OTTAWA COUNTY PARKS AND RECREATION COMMISSION



MANAGEMENT ISSUES

MANAGEMENT ISSUES

Manmade forces could have a significant impact on the natural systems of the Rosy Mound Natural Area. Management of the Natural Area involves control and redirection of these human forces, such that they are not a detriment to the Natural Area. The control and redirecting of these forces begins at the design phase, proceeds through construction and continues on a daily basis.

During discussions with the public, Parks staff and the Commission, a number of management issues were raised that focused around these forces. Some of the management issues could be addressed at the design phase; some will need to be addressed during the construction/implementation and others, of course, will need to be addressed during park operations.

These concerns are as follows:

- * Visitor Control
- * Boater Control
- * Visitor Education
- * Emergency Management
- * Environmental Protection
- * Environmental Rehabilitation
- * Handicap or Mobility - Limited Access
- * Maximum Site Capacity
- * Park Operations
- * Restrooms and Associated Waste Disposal
- * Trash Removal and Control

They have been broken into their component issues and followed with suggested goals and specific objectives for achieving the particular management goal.

Visitor Control

- Issues:
- * Protection of dunes, vegetation and sand blow-out areas from indiscriminate pedestrian movements
 - * Control of unauthorized ORV and pedestrians into site

Goal: To protect the Natural Area from the impact of human users.

Objectives:

1. Control and direct foot traffic along designated access routes.
2. Provide appropriate barriers to keep pedestrians to designated access routes or areas (i.e. railings, post & chain, signage, fencing).
3. Prohibit ORV use.
4. Channel visitors through an educational/interpretive area to acquaint them with the damage that might result from indiscriminate pedestrian movements.

5. Utilize park road entrance control structure to inform visitors of the site's fragility and appropriate visitor behavior via signage and hand-out literature.

Goal: To prevent unauthorized access into the site, thereby preventing damage to fragile areas

Objectives:

1. Secure site boundaries to prevent unrestricted pedestrian and ORV access.

Boater Control

- Issues:
- * Encroachment of boats on or in front of private property adjacent to Rosy Mound
 - * Boat landings on shore
 - * Swimmer safety

Goal: To control the impact of boating activities on residents, users and the environment.

Objectives:

1. Delineate boating beaching area(s) to minimize interference with residential water frontage.
2. Delineate boating congregation area(s) to prevent interference with swimmers.

Visitor Education

- Issues:
- * Development of visitor information about the Natural Area resource.

Goal: To increase visitor awareness of the natural system and processes of dune ecosystem.

Objectives:

1. Provide centralized interpretive display of natural features and processes at a visitor orientation facility.
2. Provide individual interpretive displays in representative areas of the Natural Area.

Goal: To increase visitor awareness of the fragility of the Natural Area.

Objectives:

1. Delineate and sign areas of threatened flora.
2. Include educational materials that discuss visitor behavior in terms of minimal resource impact.

Goal: To caution visitors about forces and hazards of the Lake Michigan shoreline.

Objectives:

1. Include warnings about plant and water and weather-related hazards in the visitor orientation facility and at beachfront restroom facility.

Emergency Management

Issues: * Provision of emergency access throughout the site

Goal: To provide reasonable emergency access to the most heavily-used portions of the site.

Objectives:

1. Develop emergency vehicular access to lakefront facilities and into interior of site, where possible.
2. Provide emergency telephone/communication access from lakefront area.

Environmental Protection

Issues: * Protection of dunes, foredune ridge, vegetation and sand blow-out area from indiscriminate visitor movements

* Protection of fragile or threatened areas of flora from visitor activities

* Protection of environment during construction and daily park operations

Goal: To protect the Natural Area from the impact of human users.

Objectives:

1. Control and direct foot traffic along designated access routes.
2. Provide appropriate barriers to keep pedestrians to designated access routes or areas (i.e. railings, post & chain, signage, fencing).
3. Secure site boundaries to prevent random ORV or pedestrian access.

Goal: To minimize environmental damage during construction and daily park operations.

Objectives:

1. Use construction techniques that minimize the need for clearing, excavating and grading in sensitive area.
2. Use water supply and waste disposal techniques that have minimal continuing impact on environmental systems.
3. Provide adequate restroom and trash services that will minimize indiscriminate waste and refuse deposits.
4. Select construction materials that can handle repeated use.

Goal: To protect fragile or threatened areas of flora from visitor activities.

Objectives:

1. Clearly protect with signage areas identified by the resource survey as fragile or threatened.
2. Ensure that no trail or walkway is constructed through areas of fragile or threatened flora.

Goal: To protect the Natural Areas from damage due to erosion caused by visitor movements.

Objectives:

1. Implement on-going maintenance efforts to identify areas eroding due to visitor action and to stabilize those areas as they occur.

Environmental Rehabilitation

- Issues:
- * Treatment of dune areas scarred by timber haul roads
 - * Treatment of newly timbered areas
 - * Treatment of existing areas damaged by ORV, traffic or foot traffic

Goal: To minimize the visual impact of haul roads and logging debris.

Objectives:

1. Obliterate haul roads by smoothing, seeding and where necessary filling along road trail to minimize visual scars.
2. Use haul road segments where appropriate as part of trail/walkway system to minimize additional clearing.
3. Place slash debris across haul roads at intervals to discourage use as foot trails.

Goal: To utilize the timbered areas as a Successional Study Area.

Objectives:

1. Cut slash and debris from logging activities and distribute throughout timbered areas to decay.
2. Place pedestrian access trails/walkways throughout parts of the timbered area and use signage and interpretive graphics to inform visitors of the history and processes associated with the successional processes of this area.

Handicapped or Mobility-Limited Access

Issues: * Access for the handicapped and mobility-limited (elderly, toddlers, etc.) to the lakefront and throughout the interior of the site

Goal: To provide reasonable, barrier-free access to representative portions of the site as can be done without damage to the resource.

Objectives:

1. Provide firm-surfaced walkways where appropriate to facilitate movement by wheeled strollers, chairs, carts or vehicles.
2. Provide barrier-free access routes to as great a variety of natural plant communities in the Natural Area as possible.

Goal: To develop alternate means of access to lakefront facilities.

Objectives:

1. Develop trails that can be upgraded to accommodate wheeled traffic to the lakefront in the future as the means/demand becomes necessary.
2. Provide for controlled access for barrier-free access to the shoreline areas via a mechanical lift along duneface.

Maximum Site Capacity

Issues: * The maximum number of visitors that can be accommodated without damage to the Natural Area resource

* The maximum number of visitors that can be accommodated without damage to the user experience of the Natural Area

Goal: To limit the number of Natural Area users to ensure minimal impact on the resource or user experience.

Objectives:

1. Control number of users by limiting vehicle and bus parking.

Park Operations

- Issues:
- * Storage of Equipment
 - * Efficient Maintenance
 - * Efficient Patrolling/Visitor Control

Goal: To encourage efficient maintenance particularly concerning trash removal and restroom facilities.

Objectives:

1. Combine maintenance/storage area with visitor education/restroom structure.
2. Develop service vehicular access along major pedestrian connector for trash pickup.
3. Provide service vehicle access to lakefront.

Goal: To facilitate patrolling of visitor facilities.

Objectives:

1. Limit trails and walkways throughout interior to reduce visitor use.
2. Provide wide, stable walkways along major pedestrian routes to facilitate use of patrol vehicles.
3. Place park employee office at visitor orientation facility for greatest exposure.

Restrooms and Associated Waste Disposal

- Issues:
- * Need for restroom facilities beyond park entry area, particularly at the lakefront
 - * Environmental damage during construction of restroom structure and associated utilities
 - * Impact of restroom facilities operations on the environment
 - * Efficient maintenance

Goal: To minimize environmental damage during construction and daily operations, particularly in sensitive lakefront area.

Objectives:

1. Use building construction techniques that reflect the difficulty of transporting materials to the site.

2. Research use of composting for sanitary wastes at lakefront facility to limit utility line or septic field construction.
3. Use natural light to restroom facility interior lighting at lakefront.

Goal: To maintain restroom facilities with minimal cost and effort.

Objectives:

1. Design restroom facility to minimize vandalism.
2. Design restroom facility to be easily accessible and maintained by park personnel.

Trash Removal and Control

- Issues:
- * Removal of trash from lakeside and interior of site
 - * Location of trash receptacles around site to minimize "loose" trash
 - * Most efficient way of performing trash collection

Goal: To minimize the likelihood of park users littering the site.

Objectives:

1. Educate visitors on need to minimize trash generation and to carry their trash out.
2. Place adequate trash receptacles at all congregation points and along major pedestrian corridors.
3. Place receptacles of an adequate design in terms of capacity, windy conditions, vermin access.

Goal: To maximize the efficiency of trash removal.

Objectives:

1. Create a central pick-up/storage point for trash readily accessible to Lake Shore Drive.
2. Accommodate small service vehicles along trails/paths with trash receptacles.
3. Specify trash receptacles with enough capacity to minimize need for frequent pickup.

MASTER PLAN

MASTER PLAN

Based upon the Site Inventory and Analysis Management Issues and input by public officials and interested citizens, a Preliminary Concept Plan was developed for the Natural Area and refined into the final Master Plan.

As previously stated, this Plan is intended to be utilized as a guideline for all future improvements, development and management within the Natural Area.

The Master Plan attempts to address the public demand for recreation along the Lake Michigan shoreline, as well as control the use of this very fragile natural resource.

Site Security

The Rosy Mound site is a unique and fragile area located in a section of the county experiencing increasing development pressures. In order to ensure that the area is not damaged by indiscriminate and increasing use by individuals on foot, on horseback or on recreational vehicles, the Master Plan proposed fencing the site along exposed segments of the property line. Fencing is shown along Lakeshore Drive and extending along the north and south property lines wherever the natural features do not limit easy access. Along segments of the south, north and east property lines, where the terrain is extremely steep, fencing may not be required. Should undesirable access occur in these areas in the future, the fencing can be extended. Along the property line shared with Construction Aggregates, it may be necessary to install fencing.

Vehicular Access

Major public access occurs from Lakeshore Drive. An entrance drive and bike path enter the site from a high point on Lakeshore Drive through a gated entry and, following the flatter portions of the terrain, curves to a parking area in a flat, depressed area approximately 800 lineal feet from Lakeshore Drive near the base of the drive formation backsides. The drive and parking areas are placed near the edges of the front portion of the site to highlight the rolling terrain and to minimize resource destruction. A control structure is placed on the entrance drive to regulate and educate visitors entering the park.

Parking Area

The Master Plan proposes a 200 car parking area that is divided into sub-areas to allow for incremental expansion and to minimize disruption of the natural features. Phase Two will contain 150 cars and Phase Three will contain 50 cars. The possibility exists for an additional 100 cars (totalling 300) if the demand is such and the resource can absorb it without damage.

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

Discussions were held with National Park personnel on the issue of site carrying capacity or visitor impact management, since this concept is utilized in National Park settings similar to the Natural Area.

Basically, the use of this tool is considered less scientific or objective and more subjective in actual use by National Park staff. Quite often, parking developments are used to regulate the number of visitors. Park personnel will develop parking incrementally and continually evaluate the resultant impact until a point is reached where park personnel are concerned that visitor use may damage the resource.

In a typical beachfront situation, the parking space numbers are based on the number of visitors that could physically fit on the beach. In the case of Rosy Mound, the beach area could generate up to 2,720 visitors at one time, or 1,088 cars (2.5 persons per car). This is based on a conservative assumption based on a 40' wide and 3,400' long beach and a low density of 50 square feet per person. Therefore, in the Master Plan, a parking area of 200 cars is a small part of the actual number of cars that could be needed.

Visitor Center

The Visitor Center has been placed as far into the site, as practical, without disturbing any fragile areas. It functions as a "gateway" into the fragile dune system, providing information, restrooms and centralized maintenance & monitoring.

The informational function is three fold:

1. Provide users with educational information about the unique and fragile natural systems of the Rosy Mound Natural Area.
2. Provide users with information about the hazards and dangers associated with the environmental forces and features.
3. Encourage users to use the park properly to avoid damaging the resource.

The building is designed to funnel all visitors through a central covered corridor lined with educational and safety information displays. In addition, for groups or special exhibits, a classroom or enclosed exhibit area is located along this central corridor.

One wing of the Visitor Center contains the public functions: classroom/exhibit space and restrooms. The other wing houses some park functions: office, maintenance area. The Visitor Center can be secured to prohibit access through the building.

Picnic Area

As the number of visitors increases, a picnic area is envisioned near the parking and Visitor Center facilities in an area of the site that is gently rolling along the edge of the woods growing along the dune backside.

The picnic area will contain a picnic shelter, small playground and a barrier-free walk loop. This area will serve families and individuals who are intending to proceed further into the interior of the site, as well as those who for mobility reasons do not wish to go too far into the Natural Area. Its setting and surrounding walks provide exposure to some of the beauty of the Natural Area, even for those who are mobility-limited.

Beachfront Access Walk

The access walk between the Visitor Center "gateway" and the opposite and western edge of the site is envisioned as a major pedestrian route, tying together the more intensive and utilitarian park functions as Lakeshore Drive and the major resource magnets, the lakefront and the related natural area of the dune formations. It extends 2,250' or 4/10 of a mile from the Visitor Center to the shoreline.

The access walk, by necessity, must pass through some very fragile areas. Given the amount of foot traffic predicted, the public need and responsibility to make it as unrestrictive to mobility as possible and the fragility of the natural areas, the access walk is proposed to be of a hard surface material(s). It laid through the dune formations in such a way as to minimize disruption/disturbance of the natural resource, and yet provide minimal impediments to foot traffic for as great a distance as possible into the site interior. Indeed, the access walk climbs 40 feet without steps until it reaches the top of the dune line immediately back of the foredune. At this point an overlook allows a view to Lake Michigan before the access walk descends by steps 60' to the sand area back of the foredune, slips across this fragile, exposed sand plain before descending 20'-30' down the face of the foredune to the beach.

Natural Area Trails

Along the access walk there are several trail heads into different areas of the property, each trail segment exposing the visitor to totally different features of the dune environment in such a way as to minimize resource destruction. Where possible, trails will follow existing foot paths to avoid further disturbance of the site.

Where the resource fragility and the amount of envisioned foot traffic dictate, some of these trail segments are partially boardwalk construction. However, most of the trail into the northern natural area will be a natural surface: woodchips, sand, etc.

There are several more access steps to the beachfront from the trail system to accommodate visitor movement from the beach into the site interior along the 3,400 feet of shoreline.

Beachfront Restroom

The Master Plan indicates a restroom facility along the beachfront access walk, several hundred feet back from the Lake Michigan shoreline.

This facility is in response to the concern that many people will be using the beach resource, either arriving from the Visitor Center 2,000 l.f. or 1/3 mile to the east or arriving by boat as is currently done. Given the number of visitors expected to use the beach resource, the restrooms will be a necessity. If no restrooms are provided, the visitors may abuse the resource with "informal" disposal methods rather than return 1/3 of a mile to the Visitor Center.

To accommodate that need, the Plan proposed a low-impact structure that has no utilities, since their construction or operation would disrupt the natural resource. The structure will house some small changing rooms and composting toilets. Natural light will replace electricity and no other power will be required.

This facility will also serve as a staging area into different areas of the site, providing another opportunity to inform and educate the visitor about the natural resources and visitor responsibilities.

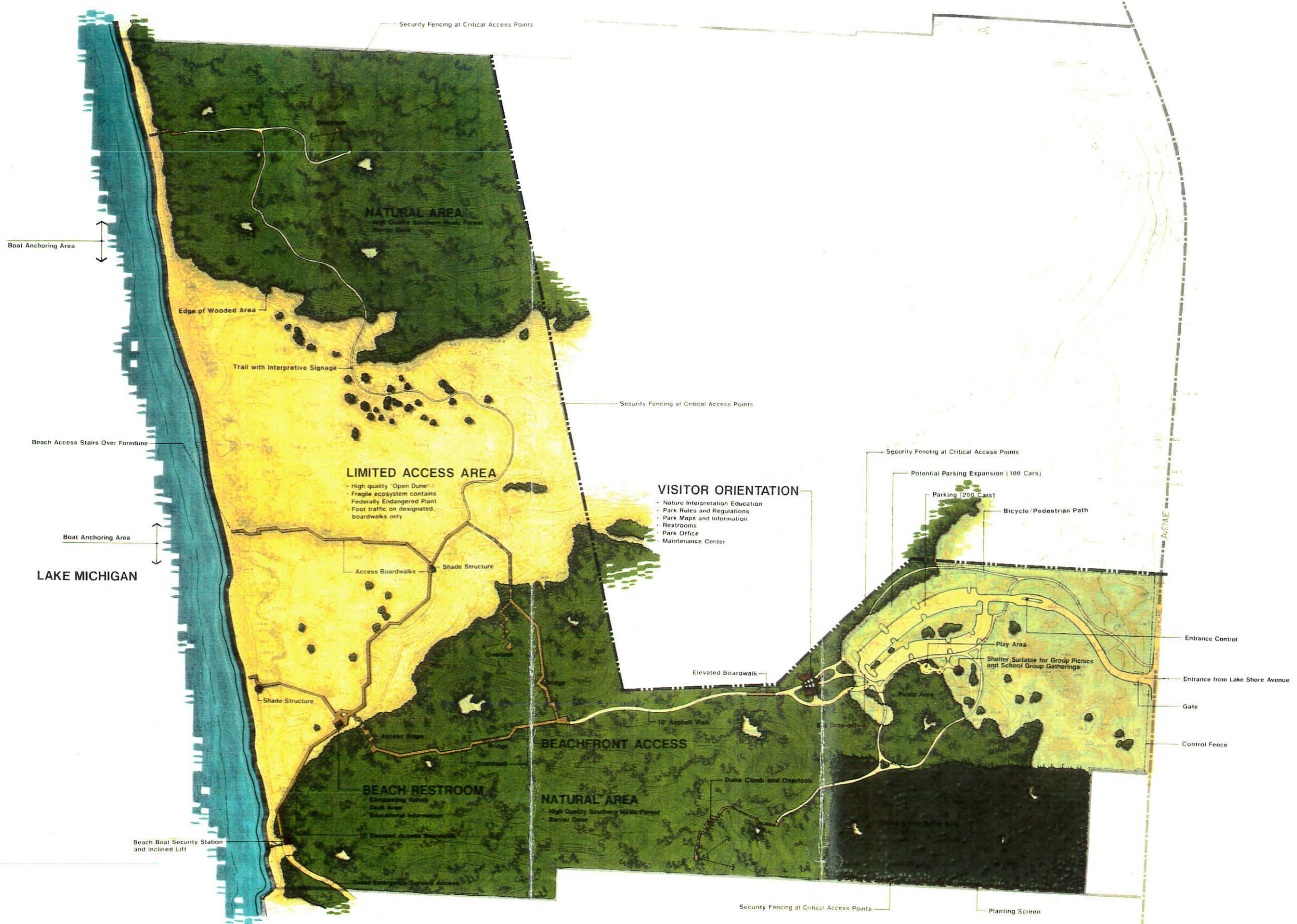
Beach Security/Emergency Access

In recognition of the difficulty of reaching the front or lakeshore portion of the site, for servicing (beachfront restrooms), for security, for emergency access or for barrier-free access, the Plan proposes a beachfront security/service and access development at the southern edge of the site. Currently there exists an access easement through the adjacent residential developments to the south of the site.

This easement would allow controlled access to the beachfront area of Rosy Mound. Even then, the fragility of the dune area, as well as the developmental restrictions imposed by the Sand Dune Management and Protection Act, require that service traffic, emergency and barrier-free traffic will need to be accommodated from the remains of a former residential property. Vehicular access can proceed only to the reconstructed garage remnant, the only remaining structure on the residential property since no new disturbance of the dune face will be allowed. From that point an inclinor (30' elevational drop) to the beach, as well as a boardwalk ramp to the beachfront restrooms and trail heads, will provide barrier-free service and emergency access to major shoreline portions of the site.

The Beach Zone

The Plan recognizes that boaters currently moor and will continue to moor offshore, but boat landings on the beach need to be restricted to prevent conflicts with future swimmers. The Plan restricts boat beaching to the mid-portion of the beach (approximately 1,200 lineal feet) and places designated swimming zones at the north and south section of the shoreline. This also will minimize conflicts between boaters and adjacent residents, as boat moorings will be less likely to occur in front of existing residential properties, but will be nearer beach areas that allow boat beaching.

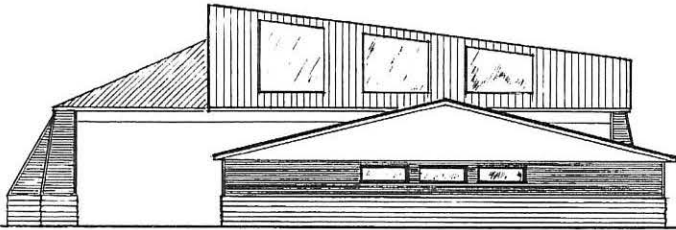


ROSY MOUND NATURAL AREA

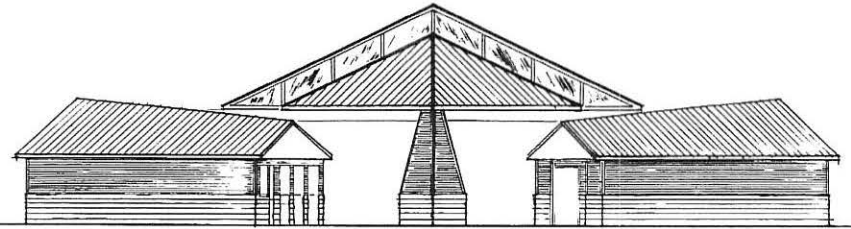
OTTAWA COUNTY, MICHIGAN MASTER PLAN



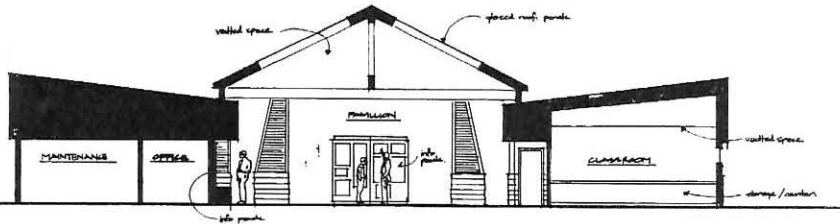
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 LANDSCAPE ARCHITECTS & LAND PLANNERS
 PARK & RECREATION PLANNERS



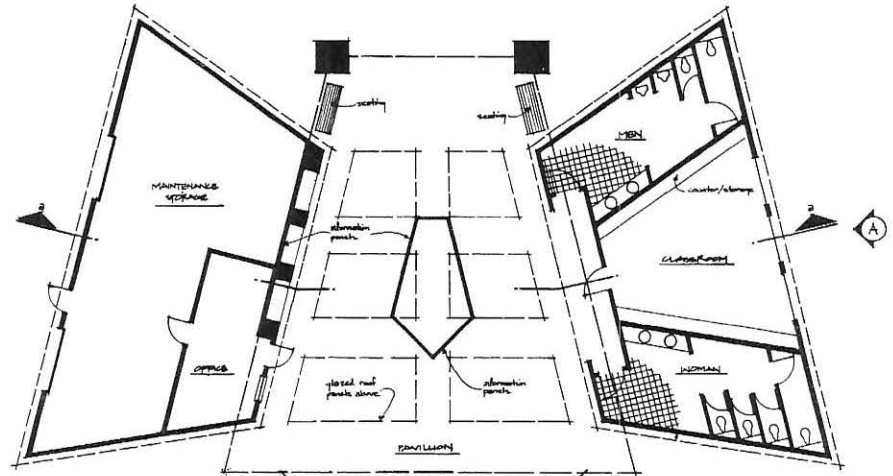
ELEVATION 'A'
1/8" = 1'-0"



ELEVATION 'B'
1/8" = 1'-0"



SECTION 'A-B'
1/8" = 1'-0"

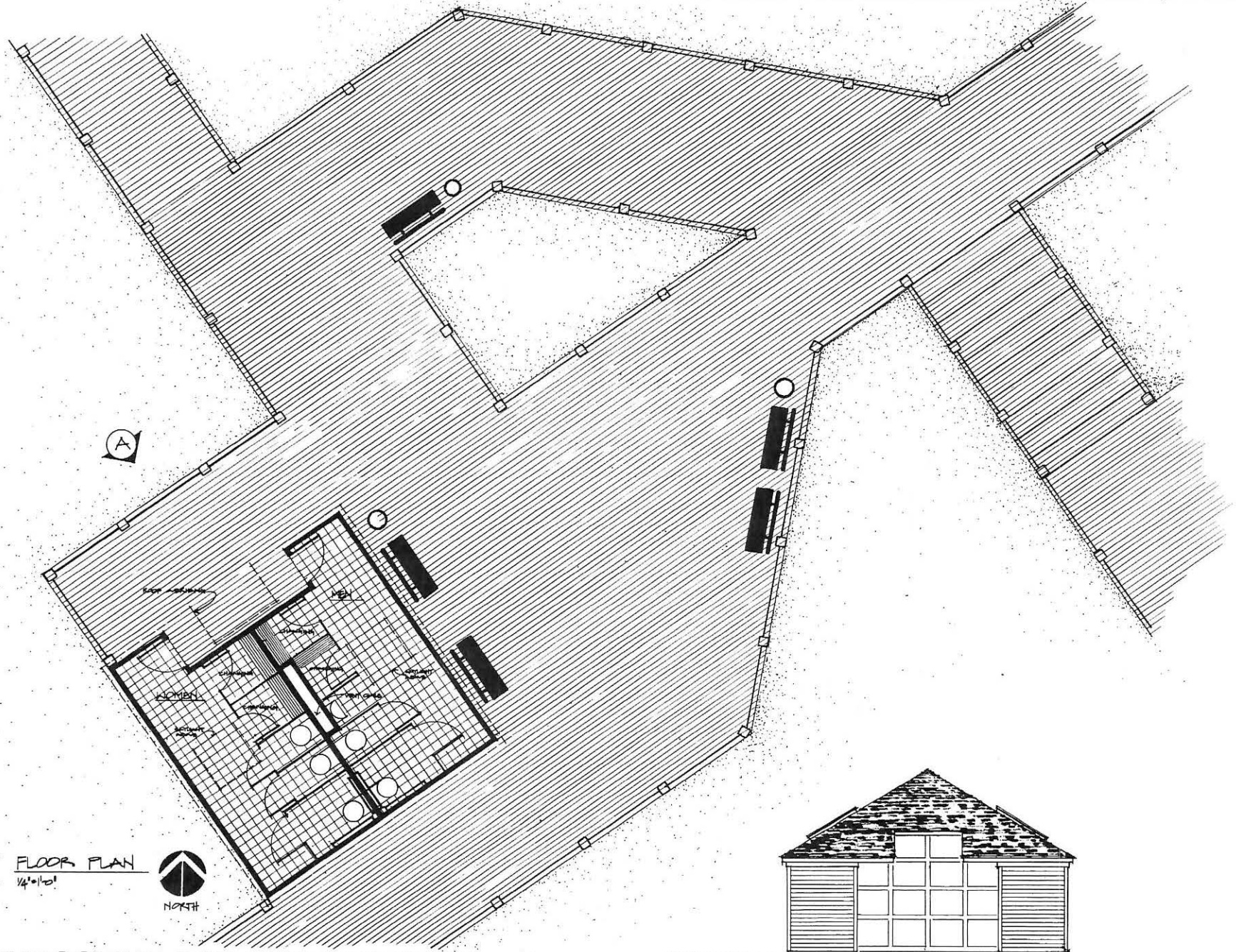


FLOOR PLAN
1/8" = 1'-0"

**VISITOR ORIENTATION CENTER
ROSY MOUND NATURAL AREA
OTTAWA COUNTY, MICHIGAN**



M.C. SMITH & ASSOCIATES, INC.
Landscape Architecture • Park & Recreation Planning
Land Planning • Downtown Planning • Urban Design
329 Greenwood Avenue S.E. • East Grand Rapids, Michigan 49506
616-451-3346 • FAX 616-451-1825



FLOOR PLAN
1/4" = 1'-0"



NORTH

ELEVATION
1/4" = 1'-0"



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**COMPOSTING TOILETING FACILITY
ROSY MOUND NATURAL AREA
OTTAWA COUNTY, MICHIGAN**

COST PROJECTIONS

COST PROJECTIONS

Based upon the Master Plan, the following are order-of-magnitude cost projections for the proposed improvements at Rosy Mound. The cost projection has been broken into four separate phases, each phase building on the previous phase.

Phase I acknowledges that site security is of immediate concern following property acquisition, to limit damage to uncontrolled use.

Phase II includes construction of the entrance drive and parking (partial); the beachfront access walk and trail to the north Natural Areas; the beach restroom facility; and the basic emergency/beach security access drive.

Phase III expands the parking area and incorporates a park control station; develops the picnic area and adjacent walks; the restroom wing of the proposed Visitor Center and the Security Station; and barrier-free walks at the Beach Security Area.

The final phase, Phase IV, completes the remainder of the trails in the natural areas and the remainder of the Visitor Center (maintenance/office wing and central roof).

Professional site engineering and architectural fees have been included in the cost projections.

The total project development costs are as follows:

ROSY MOUND NATURAL AREA Preliminary Cost Estimates

Phase I	\$97,526.00
Phase II	\$811,212.44
Phase III	\$511,436.75
Phase IV	\$539,221.38
TOTAL:	\$1,959,396.57

ROSY MOUND NATURAL AREA
PHASE I
Preliminary Cost Estimate
November, 1991

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Security Fence				
Fence (6' chainlink)	L.F.	6300	\$12.00	\$75,600.00
Control Gates	E.A.	2	\$2500.00	<u>\$5000.00</u>
				\$80,600.00
			Subtotal:	\$80,600.00
			Contingency @ 10%:	\$8060.00
			Professional Fees @ 10%:	<u>\$8866.00</u>
			TOTAL:	\$97,526.00

ROSY MOUND NATURAL AREA
PHASE II
Preliminary Cost Estimate
November, 1991

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Parking Area and Entry Drive				
Clearing of Brush/Small Trees	A.C.	2	\$3000.00	\$6000.00
Removals	L.S.	1	\$5000.00	\$5000.00
Earthwork	S.Y.	10000	\$1.50	\$15,000.00
Asphalt Entrance Drive (24')	S.Y.	4400	\$12.00	\$52,800.00
Asphalt Parking Lot (150 cars)	S.Y.	4133	\$12.00	\$49,596.00
Curbing	L.F.	475	\$10.00	\$4750.00
Wheel Stops	E.A.	150	\$45.00	\$6750.00
Repair Disturbed Dune Grass	E.A.	20,700	\$.30	\$6210.00
Seeding	S.Y.	750	\$2.25	<u>\$1687.50</u>
				\$147,793.50
Landscaping				
Planting Screen	E.A.	100	\$150.00	\$15,000.00
Trees	E.A.	20	\$200.00	\$4000.00
Shrubs	E.A.	100	\$40.00	<u>\$4000.00</u>
				\$23,000.00
Picnic Area and Restrooms				
Picnic Tables	L.S.	1	\$3000.00	\$3000.00
Restroom Development	L.S.	1	\$65,000.00	<u>\$65,000.00</u>
				\$68,000.00
Beach Restroom Area				
Structure	L.S.	1	\$72,000.00	\$72,000.00
Decking	S.F.	1200	\$12.00	\$14,400.00
Signage	L.S.	1	\$500.00	\$500.00
Site Furniture	L.S.	1	\$3000.00	<u>\$3000.00</u>
				\$89,900.00
Control Station				
Structure	L.S.	1	\$20,000.00	\$20,000.00
Asphalt Paving	S.Y.	350	\$12.00	\$4200.00
Curbing	L.F.	200	\$10.00	\$2000.00
Bollards	E.A.	15	\$40.00	<u>\$600.00</u>
				\$26,800.00

ROSY MOUND NATURAL AREA
 PHASE II
 Preliminary Cost Estimate
 Page 2

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Beach Front Access				
Interpretive Signage at Trailhead	L.S.	1	\$8000.00	\$8000.00
Asphalt Path (Complete - 8')	L.F.	1200	\$16.50	\$19,800.00
Raised Boardwalk (Complete - 8' wide)	L.F.	775	\$120.00	\$93,000.00
Boardwalk Bridge (60-80' span)	L.S.	1	\$15,000.00	\$15,000.00
Access Steps to Beachfront	S.F.	1200	\$22.00	\$26,400.00
Restroom 60' elev. (150'x8')				
Boardwalk to Fore dune (8' wide)	L.F.	450	\$80.00	\$36,000.00
Access Steps at Fore dune (8'x40')	S.F.	320	\$22.00	\$7040.00
Shade Structure	L.S.	1	\$15,000.00	<u>\$15,000.00</u>
				\$220,240.00
Trail Developments				
Trail in Limited Access Area				
- Trail (6' width)	L.F.	1700	\$6.00	\$10,200.00
- Fore dune Access Steps (20' elev.)	S.F.	270	\$22.00	\$5940.00
Trail to North Natural Area				
- Trail (Construction by owner)	L.F.	3100	\$6.00	\$18,600.00
- Overlook Steps (50' elev., 110')	S.F.	550	\$22.00	\$12,100.00
- Overlook Deck	S.F.	200	\$15.00	\$3000.00
- Shoreline Access Steps (30' elev., 35')	S.F.	175	\$22.00	\$3850.00
Signage	L.S.	1	\$1000.00	<u>\$1000.00</u>
				\$54,690.00
Beach Security Access Drive				
Removals	L.S.	1	\$2500.00	\$2500.00
Stablization	L.S.	1	\$4000.00	\$4000.00
Clearing	A.C.	1/4	\$3600.00	\$900.00
Earthwork	S.Y.	1000	\$1.50	\$1500.00
Asphalt Drive	S.Y.	800	\$12.00	<u>\$9600.00</u>
				\$18,500.00

ROSY MOUND NATURAL AREA
 PHASE II
 Preliminary Cost Estimate
 Page 3

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Miscellaneous				
Entry Sign	L.S.	1	\$5000.00	\$5000.00
Directional Signs	L.S.	1	\$1500.00	\$1500.00
Benches	L.S.	1	\$5000.00	\$5000.00
Trash	L.S.	1	\$2000.00	\$2000.00
				<u>\$13,500.00</u>
Survey Cost				<u>\$8000.00</u>
				<u>\$8000.00</u>
Subtotal:				\$670,423.50
Contingency @ 10%:				\$67,042.35
Professional Fees @ 10%:				<u>\$73,746.59</u>
TOTAL:				\$811,212.44

ROSY MOUND NATURAL AREA
PHASE III
Preliminary Cost Estimate
November, 1991

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Parking Area Expansion				
Removals	L.S.	1	\$1000.00	\$1000.00
Clearing	A.C.	1/2	\$3000.00	\$1500.00
Earthwork	S.Y.	1500	\$1.50	\$2250.00
Asphalt Parking Lot (50)	S.Y.	1200	\$12.00	\$14,400.00
Curbing	L.F.	1250	\$10.00	\$2500.00
Wheel Stops	E.A.	50	\$45.00	<u>\$2250.00</u>
				\$23,900.00
Beach Security Station/Emergency Access				
Elevated Access Boardwalk (8' wide)	L.F.	400	\$160.00	\$64,000.00
Access Boardwalk (8' wide)	L.F.	150	\$120.00	\$18,000.00
Beach Security Station	L.S.	1	\$35,000.00	\$35,000.00
Inclinorator	L.S.	1	\$25,000.00	<u>\$25,000.00</u>
				\$142,000.00
Walks and Paths at Entrance Drive and Picnic Area				
Bike Path Connector (8' asphalt) (Complete)	L.F.	750	\$16.50	\$12,375.00
Walk at Picnic Area (8' asphalt) (Complete)	L.F.	750	\$16.50	<u>\$12,375.00</u>
				\$24,750.00
Boardwalk Developments				
Boardwalk in Limited Access Area				
- Boardwalk (6' width)	L.F.	1700	\$72.00	\$122,400.00
- Shade Structure	L.S.	1	\$12,000.00	<u>\$12,000.00</u>
				\$134,400.00
Picnic Area				
Cleaning/Clearing	A.C.	1	\$2000.00	\$2000.00
Shelter Area	L.S.	1	\$35,000.00	\$35,000.00
Playground Area	L.S.	1	\$55,000.00	\$55,000.00
Seeding	S.Y.	2500	\$2.25	<u>\$5625.00</u>
				\$97,625.00

ROSY MOUND NATURAL AREA
PHASE III
Preliminary Cost Estimate
Page 2

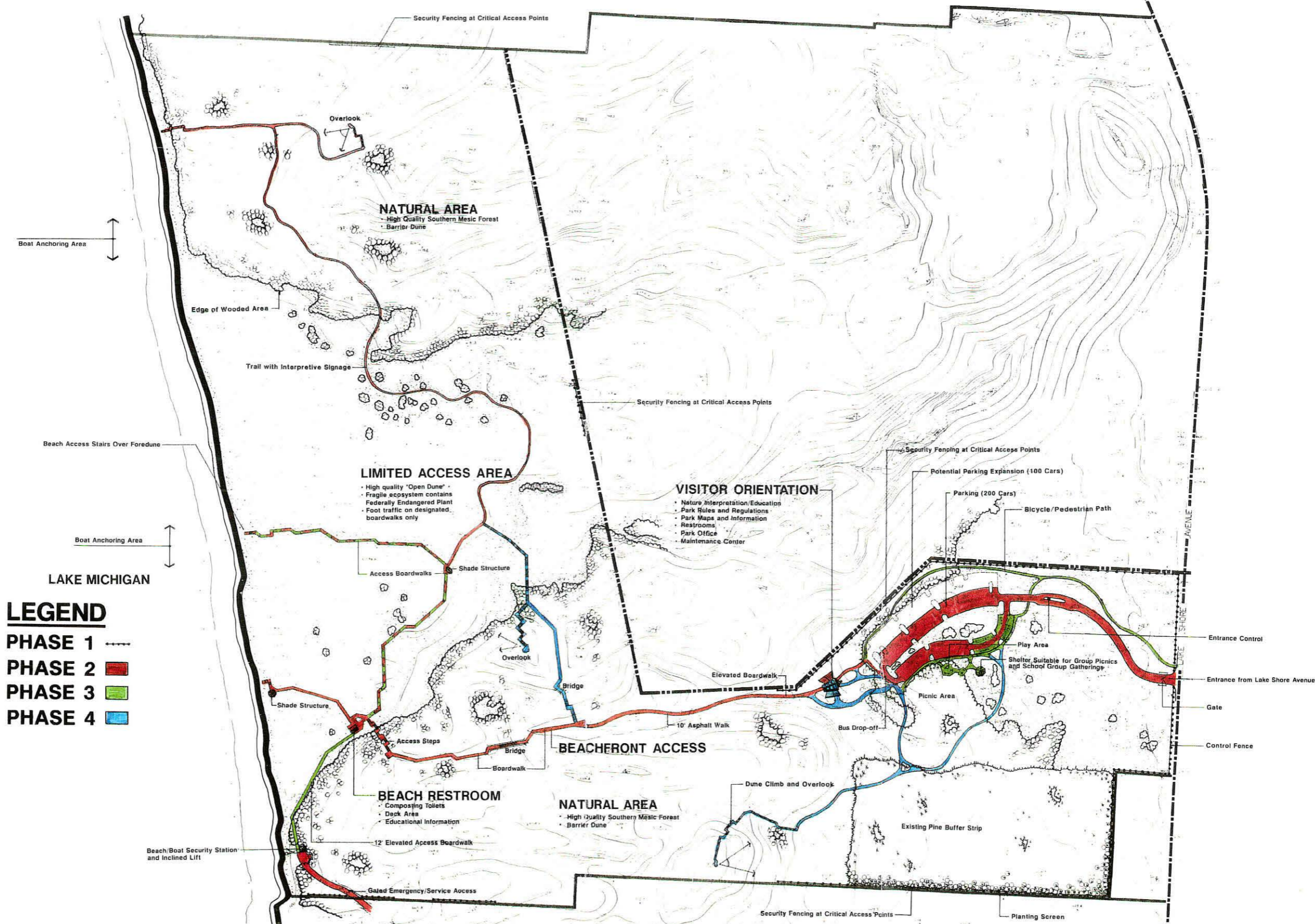
Subtotal	\$422,675.00
Contingency @ 10%	\$42,267.50
Professional Fees @ 10%	<u>\$46,494.25</u>
TOTAL:	\$511,436.75

**ROSY MOUND NATURAL AREA
PHASE IV
Preliminary Cost Estimate
November, 1991**

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Walks and Trails at Picnic Area				
Bike Path Connector to Visitor Center	L.F.	850	\$16.50	\$14,025.00
Asphalt Walk Around Picnic	L.F.	1050	\$14.00	\$14,700.00
Trail to Dune Climb	L.F.	600	\$12.00	\$7200.00
Overlook Steps (70' elev., 150' length)	S.F.	750	\$22.00	\$16,500.00
Overlook Deck	S.F.	200	\$15.00	\$3000.00
Overlook Boardwalk	L.F.	300	\$75.00	<u>\$22,500.00</u>
				\$77,925.00
Boardwalk Link Between Beachfront Access Trail and Limited Access Area				
Boardwalk (6')	L.F.	350	\$60.00	\$21,000.00
Bridge Segment	L.F.	30	\$200.00	\$6000.00
Steps (60' elev., 130' length)	S.F.	780	\$22.00	\$17,160.00
Overlook Steps (55' elev., 120' length)	S.F.	600	\$22.00	\$13,200.00
Overlook Deck	S.F.	200	\$15.00	\$ 3000.00
Dune Face Steps (90' elev., 200' long)	S.F.	1200	\$22.00	<u>\$26,400.00</u>
				\$86,760.00
Visitor Center				
Structure	L.S.	1	\$203,090.00	\$203,090.00
Clearing	A.C.	1/4	\$4000.00	\$1000.00
Grading	S.Y.	1500	\$1.50	\$2250.00
Septic Field (Phase II)	L.S.	1	-0-	-0-
Water Line	L.F.	1500	\$18.00	\$27,000.00
Power (Phase II)	L.S.	0	-0-	-0-
Phone	L.S.	1	\$1000.00	\$1000.00
Security Lights	L.S.	1	\$5000.00	\$5000.00
Maintenance Drive	S.Y.	675	\$12.00	\$8100.00
Walks (8')	L.F.	225	\$16.50	\$3712.50
Furnishings	L.S.	1	\$5000.00	\$5000.00
Signs	L.S.	1	\$1000.00	\$1000.00
Trash Enclosures	L.S.	1	\$3000.00	\$3000.00
Seeding Repairs	S.Y.	800	\$2.25	\$1800.00
Interpretive Displays	L.S.	1	\$10,000.00	<u>\$10,000.00</u>
				\$271,952.50

ROSY MOUND
 PHASE IV
 Preliminary Cost Estimate
 Page 2

<u>Item</u>	<u>Unit</u>	<u>No. of Units</u>	<u>Unit Price</u>	<u>Extension</u>
Landscaping				
Trees	E.A.	20	\$250.00	\$5000.00
Shrubs	E.A.	100	\$40.00	<u>\$4000.00</u>
				\$9000.00
Subtotal:				\$445,637.50
Contingency @ 10%				\$44,563.75
Professional Fees @ 10%				<u>\$49,020.13</u>
TOTAL:				\$539,221.38



PHASING PLAN
ROSY MOUND NATURAL AREA
 OTTAWA COUNTY, MICHIGAN

MASTER PLAN



M.C. SMITH & ASSOCIATES, INC.
 LANDSCAPE ARCHITECTS & LAND PLANNERS
 PARK & RECREATION PLANNERS

APPENDIX

Summary of Sand Dunes Statutes

P.A. 146 and 147 were signed into law by Governor Blanchard on July 5, 1989. These two statutes together provide protection for Michigan's critical dune areas---those which are the most sensitive to alteration and change. P.A. 146 provides the procedures for administration of the two statutes.

The Act provides that:

-By October 1, 1989 the Director will mail notices to each property owner of record in critical dune areas informing them that their property is subject to regulation under the Act.

-A local unit of government may elect to issue permits for uses in critical dune areas during the interim period from July 5, 1989 to July 1, 1990, the date by which interested communities are to have local zoning ordinances in place. (Communities that were interested in assuming this responsibility were to have adopted a resolution by agreeing to enforce the standards in the Act by August 1, 1989.)

-The Department of Natural Resources will issue permits for uses in critical dunes during the interim period if a local unit chooses not to assume permitting authority.

-Local units have the option of formulating a zoning ordinance which provides equal or greater protection than the Act's model zoning plan. If the local unit does not adopt an ordinance and submit it to the Department for approval by July 1, 1990, the Department will assume permitting authority for uses in critical dunes in that community.

-A local community may establish a use permit and inspection to defray the cost of administering the Act and ordinance.

-Uses that have received all necessary State and local permits by July 5, 1989 are exempt from the Act.

-Provisions in local ordinances may be developed for the continuance, completion, extension and substitution of existing non-conforming uses.

P.A. 147 contains a model zoning plan which provides standards for development in critical dune areas. These standards are applied in the review of applications and issuance of permits. Highlights include the following:

-Unless a variance is granted, the following uses in a critical dune area are prohibited:

- a structure on a slope of 18-25% unless plans are prepared by a registered professional architect or engineer.
- a use on a slope that is greater than 25%.
- silvicultural practices, vegetation removal, and uses involving contour changes that are likely to increase erosion, decrease stability, or are more extensive than required to implement a use.

- Structures must be located behind the crest of the first landward ridge of a critical dune that is not a foredune. If construction occurs within 100 feet of the crest, the applicant must show that the proposed use will meet specific standards to ensure that the stability of the dune is maintained.

- Local units that have assumed the administrative responsibilities under P.A. 146 may issue variances under specific guidelines for non-conforming lots of record.

-The Act provides for Department review of all "special use projects." Special use projects are defined as any industrial or commercial use regardless of size, a multifamily use of more than 3 acres, and a multifamily use of 3 acres or less if the density of use is greater than 4 individual residences per acre. Local units with approved ordinances may review applications for special use projects, and forward the application with their proposed decision to the Department for review. The local unit's proposed decision may be affirmed, modified or reversed by the Department.

-All permit applications for special use projects must include an environmental assessment.

Act No. 147
Public Acts of 1989
Approved by the Governor
July 5, 1989
Filed with the Secretary of State
July 5, 1989

**STATE OF MICHIGAN
85TH LEGISLATURE
REGULAR SESSION OF 1989**

Introduced by Senators Binsfeld, Cruce, Gast, Shinkle, Sederburg, Fessler, Posthumus, Irwin, Carl, Dillingham, Nichols, Geake, DeGrow, DiNello, Barcia, Geo. Hart, Faxon, Cropsey, Welborn, N. Smith and O'Brien

ENROLLED SENATE BILL No. 179

AN ACT to amend Act No. 222 of the Public Acts of 1976, entitled "An act to provide for study, protection, management, and reclamation of Great Lakes sand dunes; to prescribe powers and duties of the department of natural resources; to prescribe fees for the administration and enforcement of this act; and to provide penalties," as amended, being sections 281.651 to 281.664 of the Michigan Compiled Laws, by adding chapter 4; and to repeal certain parts of the act on a specific date.

The People of the State of Michigan enact:

Section 1. Act No. 222 of the Public Acts of 1976, as amended, being sections 281.651 to 281.664 of the Michigan Compiled Laws, is amended by adding chapter 4 to read as follows:

CHAPTER 4. MODEL ZONING PLAN

Sec. 30. As used in this chapter:

(a) "Crest" means the line at which the first lakeward facing slope of a critical dune ridge breaks to a slope of less than 18% for a distance of at least 20 feet, if the areal extent where this break occurs is greater than 1/10 acre in size.

(b) "Foredune" means 1 or more low linear dune ridges that are parallel and adjacent to the shoreline of a Great Lake and are rarely greater than 20 feet in height. The lakeward face of a foredune is often gently sloping and may be vegetated with dune grasses and low shrub vegetation or may have an exposed sand face.

(c) "Planning commission" means the body or entity within a local government that is responsible for zoning and land use planning for the local unit of government.

(d) "Restabilization" means restoration of the natural contours of a critical dune to the extent practicable, and the restoration of the protective vegetative cover of a critical dune through the establishment of indigenous vegetation, and the placement of snow fencing or other temporary sand trapping measures for the purpose of preventing erosion, drifting, and slumping of sand.

Sec. 31. (1) After consulting with the local soil conservation district, a local unit of government that has 1 or more critical dune areas within its jurisdiction may formulate a zoning ordinance pursuant to the following:

(a) A county may zone as provided in the county rural zoning enabling act, Act No. 183 of the Public Acts of 1943, being sections 125.201 to 125.232 of the Michigan Compiled Laws.

(b) A city or village may zone as provided in Act No. 207 of the Public Acts of 1921, being sections 125.581 to 125.592 of the Michigan Compiled Laws.

(c) A township may zone as provided in the township rural zoning act, Act No. 184 of the Public Acts of 1943, being sections 125.271 to 125.301 of the Michigan Compiled Laws.

(2) A zoning ordinance shall consist of all of the provisions of the model zoning plan or comparable provisions that are at least as protective of critical dune areas as the model zoning plan.

(3) A local unit of government may regulate additional lands as critical dune areas under this act as considered appropriate by the planning commission if the lands are determined by the local unit of government to be essential to the hydrology, ecology, topography, or integrity of a critical dune area. A local unit of government shall provide within its zoning ordinance for the protection of lands that are within 250 feet of a critical dune area, if those lands are determined by the local unit of government to be essential to the hydrology, ecology, topography, or integrity of a critical dune area.

(4) If a local unit of government does not have an approved zoning ordinance, the department may regulate additional lands described in subsection (3). However, the lands added by the department shall not extend more than 250 feet from the landward boundary of a critical dune area, unless the governing body of the local unit of government authorizes such an extension.

Sec. 32. A zoning ordinance shall require that all applications for permits for the use of a critical dune area include in writing:

(a) That the county enforcing agency designated pursuant to the soil erosion and sedimentation control act of 1972, Act No. 347 of the Public Acts of 1972, being sections 282.101 to 282.125 of the Michigan Compiled Laws, finds that the project is in compliance with Act No. 347 of the Public Acts of 1972 and any applicable soil erosion and sedimentation control ordinance that is in effect in the local unit of government.

(b) That a proposed sewage treatment or disposal system on the site has been approved by the county health department or the department.

(c) Assurances that the cutting and removing of trees and other vegetation will be performed according to the instructions or plans of the local soil conservation district. These instructions or plans may include all applicable silvicultural practices as described in the "voluntary forestry management guidelines for Michigan" prepared by the society of American foresters in 1987. The instructions or plans may include a program to provide mitigation for the removal of trees or vegetation by providing assurances that the applicant will plant on the site more trees and other vegetation on the site than were removed by the proposed use.

(d) Except as otherwise provided in subdivision (c), a site plan that contains data required by the planning commission concerning the physical development of the site and extent of disruption of the site by the proposed development. The planning commission may consult with the soil conservation district in determining the required data.

(e) An environmental assessment that comports with section 37 for a special use project. An environmental impact statement pursuant to section 38 may be required if the additional information is considered necessary or helpful in reaching a decision on a permit application for a special use project.

Sec. 33. (1) A zoning ordinance shall provide for all of the following:

(a) Lot size, width, density, and front and side setbacks.

(b) Storm water drainage that provides for disposal of drainage water without serious erosion.

(c) Methods for controlling erosion from wind and water.

(d) Restabilization.

(2) Each zoning ordinance shall provide that a use that proposes a subdivision development shall be reviewed by the local unit of government to assure compliance with all of the provisions of the model zoning plan.

Sec. 34. A zoning ordinance shall not permit either of the following uses in a critical dune area:

(a) The disposal of sewage on-site unless the standards of applicable sanitary codes are met or exceeded.

(b) A use that does not comply with the minimum setback requirements required by rules that are promulgated under the shorelands protection and management act of 1970, Act No. 245 of the Public Acts of 1970, being sections 281.631 to 281.644 of the Michigan Compiled Laws.

Sec. 35. (1) Unless a variance is granted pursuant to section 36, a zoning ordinance shall not permit the following uses in a critical dune area:

(a) A structure on a slope within a critical dune area that is 18% to 25% unless the structure is in accordance with plans prepared for the site by a registered professional architect or a licensed professional engineer and the plans provide for the disposal of storm waters without serious soil erosion and without sedimentation of any stream or other body of water. Prior to approval of the plan, the planning commission shall consult with the local soil conservation district.

(b) A use on a slope within a critical dune area that is greater than 25%.

(c) A use that is a structure that is not in compliance with subsection (2).

(d) A use involving a contour change that is likely to increase erosion, decrease stability, or is more extensive than required to implement a use for which a permit is requested.

(e) Silvicultural practices, as described in the "voluntary forest management guidelines for Michigan", prepared by the society of American foresters in 1987, that are likely to increase erosion, decrease stability, or are more extensive than required to implement a use for which a permit is requested.

(f) A use that involves a vegetation removal that is likely to increase erosion, decrease stability, or is more extensive than required to implement a use for which a permit is requested.

(g) A use that is not in the public interest. In determining whether a proposed use is in the public interest, the local unit of government shall consider both of the following:

(i) The availability of feasible and prudent alternative locations or methods, or both, to accomplish the benefits expected from the use. If a proposed use is 1 single family dwelling on a lot of record owned by the applicant, consideration of feasible and prudent alternative locations shall be limited to the lot of record on which the use is proposed. A lot of record shall not be created strictly for the purpose of avoiding consideration of alternative locations under this subparagraph.

(ii) The impact that is expected to occur to the critical dune area, and the extent to which the impact may be minimized.

(2) A use that is a structure shall be constructed behind the crest of the first landward ridge of a critical dune area that is not a foredune. However, if construction occurs within 100 feet measured landward from the crest of the first landward ridge that is not a foredune, the applicant shall demonstrate that the proposed use meets all of the following requirements:

(a) The use will not destabilize the critical dune area.

(b) Contour changes and vegetative removal are limited to that essential to siting the structure.

(c) Access to the structure is from the landward side of the dune.

(d) The dune is restabilized with indigenous vegetation.

(e) Construction techniques and methods are employed that mitigate the impact on the dune.

(f) The crest of the dune is not reduced in elevation.

(g) If the department is implementing the provisions of the model zoning plan, the use meets all other applicable requirements of the zoning ordinance or the model zoning plan.

(3) If the local unit of government is not certain of the degree of slope on a property for which a use permit is sought, the local unit may require that the applicant supply contour maps of the site with 5-foot intervals at or near any proposed structure or roadway or consult with the local soil conservation district regarding the degree of slope.

Sec. 36. (1) A local unit of government may issue variances under a zoning ordinance, or the department may issue special exceptions under the model zoning plan if a local unit of government does not have an approved zoning ordinance, if an unreasonable hardship will occur to the owner of the property if the variance or special exception is not granted. A variance or a special exception shall also be subject to the following limitations:

(a) A variance shall not be granted from a setback requirement unless the property for which the variance is requested is 1 of the following:

(i) A nonconforming lot of record that is recorded prior to the effective date of this section and that becomes nonconforming due to the operation of this act or a zoning ordinance.

(ii) A lot legally created after the effective date of this section that later becomes nonconforming due to natural shoreline erosion.

(iii) Property on which the base of the first landward critical dune of at least 20 feet in height, that is not a foredune, is located at least 500 feet inland from the first foredune crest or line of vegetation on the property. However, the setback shall be a minimum of 200 feet measured from the foredune crest or line of vegetation.

(b) A variance shall not be granted that authorizes construction of a dwelling or other permanent building on the first lakeward facing slope of a critical dune area or a foredune. However, a variance may be granted if the proposed construction is near the base of the lakeward facing slope of the critical dune on a slope of less than 12% on a nonconforming lot of record that is recorded prior to the effective date of this chapter that has borders that lie entirely on the first lakeward facing slope of the critical dune area that is not a foredune.

(2) Each local unit of government that has issued a variance for a use other than a special use project during the previous 12 months shall file an annual report with the department indicating variances that have been granted by the local unit of government during that period.

Sec. 37. The zoning ordinance shall provide that if an environmental assessment is required under section 32(e), that assessment shall include the following information concerning the site of the proposed use:

- (a) The name and address of the applicant.
- (b) A description of the applicant's proprietary interest in the site.
- (c) The name, address, and professional qualifications of the person preparing the environmental assessment and his or her opinion as to whether the proposed development of the site is consistent with protecting features of environmental sensitivity and archaeological or historical significance that may be located on the site.
- (d) The description and purpose of the proposed use.
- (e) The location of existing utilities and drainageways.
- (f) The general location and approximate dimensions of proposed structures.
- (g) Major proposed change of land forms such as new lakes, terracing, or excavating.
- (h) Sketches showing the scale, character, and relationship of structures, streets, or driveways, and open space.
- (i) Approximate location and type of proposed drainage, water, and sewage facilities.
- (j) Legal description of property.
- (k) A physical description of the site, including its dominant characteristics, its vegetative character, its present use, and other relevant information.
- (l) A natural hazards review consisting of a list of natural hazards such as periodic flooding, poor soil bearing conditions, and any other hazards peculiar to the site.
- (m) An erosion review showing how erosion control will be achieved, and illustrating plans or programs that may be required by any existing soil erosion and sedimentation ordinance.

Sec. 38. If an environmental impact statement is required under section 32(e) prior to permitting a proposed use, a zoning ordinance may require that the statement include all of the following:

- (a) The name and address of the applicant.
- (b) A description of the applicant's proprietary interest in the site of the proposed use.
- (c) The name, address, and professional qualifications of the proposed professional design team members, including the designation of the person responsible for the preparation of the environmental impact statement.
- (d) The description and purpose of the proposed use.
- (e) Six copies and 1 reproducible transparency of a schematic use plan of the proposed use showing the general location of the proposed use and major existing physical and natural features on the site, including, but not limited to, watercourses, rock outcropping, wetlands, and wooded areas.
- (f) The location of the existing utilities and drainageways.
- (g) The location and notation of public streets, parks, and railroad and utility rights-of-way within or adjacent to the proposed use.
- (h) The general location and dimensions of proposed streets, driveways, sidewalks, pedestrian ways, trails, off-street parking, and loading areas.
- (i) The general location and approximate dimensions of proposed structures.
- (j) Major proposed change of land forms such as new lakes, terracing, or excavating.
- (k) Approximate existing and proposed contours and drainage patterns, showing at least 5-foot contour intervals.
- (l) Sketches showing the scale, character, and relationship of structures, streets, or driveways, and open space.
- (m) Approximate location and type of proposed drainage, water and sewage treatment and disposal facilities.
- (n) A legal description of the property.
- (o) An aerial photo and contour map showing the development site in relation to the surrounding area.
- (p) A description of the physical site, including its dominant characteristics, its vegetative character, its present use, and other relevant information.
- (q) A soil review giving a short descriptive summary of the soil types found on the site and whether the soil permits the use of septic tanks or requires central sewer. The review may be based on the "unified soil classification system" as adopted by the United States government corps of engineers and bureau of reclamation, dated January 1952, or the national cooperative soil survey classification system, and the standards for the development prospects that have been offered for each portion of the site.

(r) A natural hazards review consisting of a list of natural hazards such as periodic flooding, poor soil bearing conditions, and any other hazards peculiar to the site.

(s) A substrata review including a descriptive summary of the various geologic bedrock formations underlying the site, including the identification of known aquifers, the approximate depths of the aquifers and, if being tapped for use, the principal uses to be made of these waters, including irrigation, domestic water supply, and industrial usage.

(t) An erosion review showing how erosion control will be achieved, and illustrating plans or programs that may be required by any existing soil erosion and sedimentation ordinance.

(u) At a minimum, plans for compliance with all of the following standards shall be required for construction and postconstruction periods:

(i) Surface drainage designs and structures are erosion proof through control of the direction, volume, and velocities of drainage patterns. These patterns shall promote natural vegetation growth that are included in the design in order that drainage waters may be impeded in their flow and percolation encouraged.

(ii) The design shall include trash collection devices when handling street and parking drainage to contain solid waste and trash.

(iii) Watercourse designs, control volumes, and velocities of water to prevent bottom and bank erosion. In particular, changes of direction shall guard against undercutting of banks.

(iv) If vegetation has been removed or has not been able to occur on surface areas such as infill zones, it shall be the duty of the developer to stabilize and control the impacted surface areas to prevent wind erosion and the blowing of surface material through the planting of grasses, and windbreaks and other similar barriers.

Sec. 39. A zoning ordinance shall provide that in reviewing a site plan required under section 32(d), the planning commission shall do all of the following:

(a) Determine whether the requirements of the zoning ordinance have been met and whether the plan is consistent with existing laws.

(b) Determine whether the advice or assistance of the soil conservation district will be helpful in reviewing a site plan.

(c) Recommend alterations of a proposed development to minimize adverse effects anticipated if the development is approved and to assure compliance with all applicable state and local requirements.

Sec. 40. Prior to issuing a permit allowing a special use project within a critical dune area, a local unit of government shall submit the special use project application and plan and the proposed decision of the local unit of government to the department. The department shall have 60 days to review the plan and may affirm, modify, or reverse the proposed decision of the local unit of government.

Sec. 41. A structure or use located in a critical dune area that is destroyed by fire, other than arson for which the owner is found to be responsible, or an act of nature, except for erosion, is exempt from the operation of this act or a zoning ordinance under this act for the purpose of rebuilding or replacing the structure or use, if the structure or use was lawful at the time it was constructed or commenced and the structure does not exceed in size or scope that which was destroyed and does not vary from its prior use.

Sec. 42. Federally owned land, to the extent allowable by law, and state owned land within critical dune areas shall be managed by the federal or state government, respectively, in a manner that is consistent with the model zoning plan.

Sec. 43. The commission or local units of government may purchase lands or interests in lands from a willing seller in critical dune areas for the purpose of maintaining or improving the critical dune areas and its environment in conformance with the zoning ordinance, or the model zoning plan if the local unit of government does not have an approved zoning ordinance. Interests that may be purchased may include easements designed to provide for the preservation of critical dune areas and to limit or eliminate development in critical dune areas.

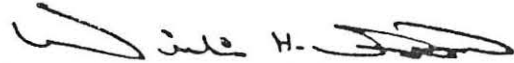
Sec. 44. (1) The legislature shall appropriate to the departments of agriculture, natural resources, and the attorney general sufficient funds to assure the full implementation and enforcement of chapter 3 and this chapter.

(2) Appropriations to the department of agriculture shall be sufficient to assure adequate funding for the soil conservation districts to fulfill their responsibilities under this chapter.

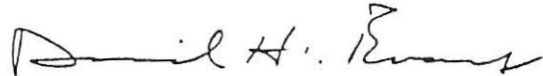
Section 2. This amendatory act shall not take effect unless House Bill No. 4296 of the 85th Legislature is enacted into law.

Section 3. Sections 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, and 44 of Act No. 222 of the Public Acts of 1976, being sections 281.680, 281.681, 281.682, 281.683, 281.684, 281.685, 281.686, 281.687, 281.688, 281.689, 281.690, 281.691, 281.692, 281.693, and 281.694 of the Michigan Compiled Laws, are repealed effective June 15, 1995.

This act is ordered to take immediate effect.



Secretary of the Senate.



Clerk of the House of Representatives.

Approved

.....
Governor.



Act No. 146
Public Acts of 1989
Approved by the Governor
July 5, 1989
Filed with the Secretary of State
July 5, 1989

**STATE OF MICHIGAN
85TH LEGISLATURE
REGULAR SESSION OF 1989**

Introduced by Reps. Jondahl, Hillegonds, Scott, DeBeaussaert, Johnson, Hoffman, Pitoniak, Sikkema, DeMars, Gubow, Miller, Runco, Bartnik, Krause, Berman, Ciaramitaro, Martin, Bandstra, Brown, Gire, Honigman, Jonker, Emerson, Dolan, Perry Bullard, Crandall, Murphy and Hertel
Rep. Rocca named co-sponsor

ENROLLED HOUSE BILL No. 4296

AN ACT to amend the title and sections 2, 10, 11, and 14 of Act No. 222 of the Public Acts of 1976, entitled "An act to provide for study, protection, management, and reclamation of Great Lakes sand dunes; to prescribe powers and duties of the department of natural resources; to prescribe fees for the administration and enforcement of this act; and to provide penalties," section 11 as amended by Act No. 94 of the Public Acts of 1987, being sections 281.652, 281.660, 281.661, and 281.664 of the Michigan Compiled Laws; to add sections 1a, 2a, 2b, and chapter 3; and to repeal certain parts of the act on a specific date.

The People of the State of Michigan enact:

Section 1. The title and sections 2, 10, 11, and 14 of Act No. 222 of the Public Acts of 1976, section 11 as amended by Act No. 94 of the Public Acts of 1987, being sections 281.652, 281.660, 281.661, and 281.664 of the Michigan Compiled Laws, are amended and sections 1a, 2a, 2b, and chapter 3 are added to read as follows:

TITLE

An act to provide for the study, protection, management, regulation, and reclamation of sand dune areas and critical dune areas; to prescribe the powers and duties of certain state agencies, persons, and local units of government; to provide for the issuance of permits, local zoning, and a model zoning plan regulating critical dune area uses; to prescribe fees for the administration and enforcement of this act and provide for the disposition of those fees; and to prescribe penalties and provide remedies.

CHAPTER 1 DEFINITIONS

Sec. 1a. The legislature finds that:

(a) The critical dune areas of this state are a unique, irreplaceable, and fragile resource that provide significant recreational, economic, scientific, geological, scenic, botanical, educational, agricultural, and ecological benefits to the people of this state and to people from other states and countries who visit this resource.

(b) Local units of government should have the opportunity to exercise the primary role in protecting and managing critical dune areas in accordance with this act.

(c) The benefits derived from alteration, industrial, residential, commercial, agricultural, silvicultural, and the recreational use of critical dune areas shall occur only when the protection of the environment and the ecology of the critical dune areas for the benefit of the present and future generations is assured.

Sec. 2. As used in this act:

(a) "Barrier dune" means the first landward sand dune formation along the shoreline of a Great Lake or a sand dune formation designated by the department.

(b) "Cell-unit" means a subunit of the total sand dune mining project as determined in size and location by the operator, but which shall not exceed 10 acres in size for new operations or the expansion of existing operations, and which shall not exceed 30 acres in size for existing operations.

(c) "Commission" means the commission of natural resources.

(d) "Department" means the department of natural resources.

(e) "Director" means the director of the department or his or her authorized representative.

(f) "Great Lakes" means any of the Great Lakes which has a shoreline within the state.

(g) "Operator" means an owner or lessee of mineral rights or any other person engaged in or preparing to engage in mining operations with respect to mineral rights within a sand dune area.

(h) "Person" means an individual, partnership, firm, corporation, association, local unit of government, or other political subdivision of the state, or a state or state agency.

(i) "Sand dune area" means that area designated by the department which includes those geomorphic features composed primarily of sand, whether windblown or of other origin and which lies within 2 miles of the ordinary high-water mark on a Great Lake as defined in section 2 of the Great Lakes submerged lands act, Act No. 247 of the Public Acts of 1955, as amended, being section 322.702 of the Michigan Compiled Laws, and includes critical dune areas.

(j) "Sand dune mining" means the removal of sand from sand dune areas for commercial, or industrial purposes, or both.

Sec. 2a. As used in this act:

(a) "Contour change" includes any grading, filling, digging, or excavating that significantly alters the physical characteristic of a critical dune area, except that which is involved in sand dune mining.

(b) "Critical dune area" means a geographic area designated in the "atlas of critical dune areas" dated February 1989 that was prepared by the department.

(c) "Local unit of government" means a city, village, township, or county.

(d) "Zoning ordinance" means an ordinance of a local unit of government that regulates the development of critical dune areas within the local unit of government pursuant to the requirements of chapters 3 and 4.

(e) "Model zoning plan" means the model zoning plan provided for in sections 31 to 42 of chapter 4.

(f) "Special use project" means any of the following:

(i) A proposed use in a critical dune area for an industrial or commercial purpose regardless of the size of the site.

(ii) A multifamily use of more than 3 acres.

(iii) A multifamily use of 3 acres or less if the density of use is greater than 4 individual residences per acre.

(iv) A proposed use in a critical dune area, regardless of size of the use, that the planning commission, or the department if a local unit of government does not have an approved zoning ordinance, determines would damage or destroy features of archaeological or historical significance.

(g) "Use" means a developmental, silvicultural, or recreational activity done or caused to be done by a person that significantly alters the physical characteristic of a critical dune area or a contour change done or caused to be done by a person, but does not include sand dune mining.

CHAPTER 2 SAND DUNE MINING

Sec. 2b. Notwithstanding any other provision of this act, the department shall not issue a sand dune mining permit within a critical dune area after the effective date of this section except under either of the following circumstances:

(a) The operator seeks to renew or amend a sand dune mining permit that was issued prior to the effective date of this section subject to the criteria and standards applicable to a renewal or amendatory application.

(b) The operator holds a sand dune mining permit and is seeking a mining permit for land that is adjacent to property the operator is permitted to mine, and prior to the effective date of this section the operator owned the land or owned rights in the land for which the operator seeks a permit.

Sec. 10. The state or an instrumentality of the state shall not engage in the extraction of sand or other minerals from a sand dune area, except as required in the interest of public health and safety in an emergency situation resulting from a disaster as defined in section 2 of the emergency preparedness act, Act No. 390 of the Public Acts of 1976, as amended, being section 30.402 of the Michigan Compiled Laws.

Sec. 11. (1) For purposes of surveillance, monitoring, administration, and enforcement of this act, an operator is assessed a fee of not more than 10 cents per ton of sand mined from a sand dune area for the calendar year reported as described in subsection (2). Funds collected by the assessment of the fee shall not exceed the actual costs to the department of implementing the sections of this act that pertain to sand dune mining. Any fees collected under this subsection that are unexpended at the end of a fiscal year shall be credited to a separate fund of the department and carried over to the succeeding fiscal year and shall be deducted from the amount appropriated for that year for surveillance, monitoring, administration, and enforcement of this act for purposes of computing the fee to be assessed for that year.

(2) An operator shall file an annual report on or before January 31 of each year. The report shall show the areas mined and describe the progress of restoration and reclamation activities of the operator for the preceding calendar year. The report shall contain:

- (a) The number of tons of sand mined from a sand dune area.
- (b) Location of the sand dune area.

(3) The fee described in subsection (1) shall be due not more than 30 days after the department sends written notice to the operator of the amount due.

(4) The surveillance fee and annual report required by this section shall be confidential and shall not be available for public inspection without the written consent of the person filing the fee and report, except in accordance with judicial order.

(5) Failure to submit an annual report in compliance with rules promulgated by the department shall constitute grounds for revocation of a permit.

(6) A penalty equal to 10% of the amount due, or \$1,000.00, whichever is greater, shall be assessed against the operator for a fee not paid when due. An unpaid fee and penalty shall constitute a debt and become the basis of a judgment against the operator. Penalties paid pursuant to this section shall be used for the implementation, administration, and enforcement of this chapter.

(7) Records upon which the annual report is based shall be preserved for 3 years and shall be subject to audit by the department.

(8) The department shall annually prepare and submit to the house of representatives and senate committees on conservation a report on the sand mining surveillance activities undertaken by the department for the immediately preceding year and the cost of those activities.

Sec. 14. (1) If the department finds that an operator is not in compliance with this chapter, the rules promulgated under this chapter, or a provision of a permit issued under this chapter, the department may suspend or revoke the permit.

(2) At the request of the department, the attorney general may institute an action in the circuit court for a restraining order or injunction or other appropriate remedy to prevent or preclude a violation of a permit issued under this chapter, this chapter, or the rules promulgated under this chapter. This shall be in addition to the rights provided in the Thomas J. Anderson, Gordon Rockwell environmental protection act of 1970, Act No. 127 of the Public Acts of 1970, being sections 691.1201 to 691.1207 of the Michigan Compiled Laws.

(3) A person who violates this chapter or a permit issued under this chapter is guilty of a misdemeanor punishable by a fine of not more than \$5,000.00.

CHAPTER 3 CRITICAL DUNE USE PROCEDURES

Sec. 16. (1) As soon as practicable following the effective date of this chapter, the director shall notify by mail each local unit of government that has within its jurisdiction critical dune areas, and include a copy of the "atlas of critical dune areas" dated February 1989 and a copy of this act with the notice. By October 1, 1989, the director shall mail a copy of the same notice to each property owner of record who owns property within a critical dune area. The notices shall include the following information:

(a) That designated property within the local unit of government is a critical dune area that is subject to regulation under this act.

(b) A local unit of government may adopt a zoning ordinance that is approved by the department, or if the local unit of government does not have an approved ordinance, the use of the critical dune area will be regulated by the department under the model zoning plan.

(2) Upon the request of the department, a local unit of government shall supply to the department the address of each property owner of record who owns property within a critical dune area within its jurisdiction in a timely manner that enables the department to provide notice to the property owners as required under subsection (1).

Sec. 17. (1) Beginning on the effective date of this chapter and until the local unit of government either adopts a zoning ordinance that is approved by the department or the department issues permits as provided in subsection (3) or (8), whichever occurs first, the local unit of government may require the submittal of applications for permits for uses in critical dune areas. The local unit of government shall evaluate applications for uses and may issue permits for uses in critical dune areas that are in conformance with and are at least as environmentally protective as the model zoning plan.

(2) A local unit of government that elects to issue permits during the interim period described in subsection (1) shall notify the department of its decision and shall reflect this decision by passage of a resolution of its governing body or by providing documentation to the department that an existing ordinance meets or exceeds the requirements of the model zoning plan. Following the passage of the resolution, a local unit of government may issue permits during the interim period in accord with the procedures and criteria established in subsection (4).

(3) If by August 1, 1989 a local unit of government has not passed a resolution indicating its intent to issue permits during the interim period or submitted an existing ordinance that meets the requirements of this act, the department shall issue permits in the same manner provided for local units of government in subsection (4) for uses within that local unit of government under the model zoning plan until the local unit of government submits a zoning ordinance to the department and obtains approval of the ordinance.

(4) A local unit of government that issues permits during the interim time period provided for in subsection (1), or the department if it issues permits as provided under subsection (3) or (8), shall issue permits in accordance with all of the following:

(a) A person proposing a use within a critical dune area shall file an application with the local unit of government, or with the department if the department is issuing permits under the model zoning plan. The application form shall include information that may be necessary to conform with the requirements of this act. If a project proposes the use of more than 1 critical dune area location within a local unit of government, 1 application may be filed for the uses.

(b) Notice of an application filed under this section shall be sent to a person who makes a written request to the local unit of government for notification of pending applications accompanied by an annual fee established by the local unit of government. The local unit of government shall prepare a monthly list of the applications made during the previous month and shall promptly mail copies of the list for the remainder of the calendar year to the persons who have requested notice. The monthly list shall state the name and address of each applicant, the location of the applicant's project, and a summary statement of the purpose of the use. The local unit of government may hold a public hearing on pending applications.

(c) The notice shall state that unless a written request is filed with the local unit of government within 20 days after the notice is mailed, the local unit of government may grant the application without a public hearing. Upon the written request of 2 or more persons that own real property within the local unit of government or an adjacent local unit of government, or that reside within the local unit of government or an adjacent local unit of government, the local unit of government shall hold a public hearing pertaining to a permit application.

(d) At least 10 days' notice of a hearing to be held pursuant to this section shall be given by the publication in 1 or more newspapers of general circulation in the county in which the proposed use is to be located, and in other publications, if appropriate, to give notice to persons likely to be affected by the proposed use, and by mailing copies of the notice to the persons who have requested notice pursuant to subsection (1) and the person requesting the hearing.

(e) After the filing of an application, the local unit of government shall grant or deny the permit within 60 days, or within 90 days if a public hearing is held. When a permit is denied, the local unit of government shall provide to the applicant a concise written statement of its reasons for denial of the permit, and if it appears that a minor modification of the application would result in the granting of the permit, the nature of the modification shall be stated. In an emergency, the local unit of government may issue a conditional permit before the expiration of the 20-day period referred to in subdivision (c).

(f) The local unit of government shall base a decision to grant or deny a permit required by this section on the model zoning plan or on any existing ordinance that is in effect in the local unit of government that provides the same or a greater level of protection for critical dune areas and which is approved by the department.

(5) A local unit of government zoning ordinance regulating critical dune areas may be more restrictive of development and more protective of critical dune areas than the model zoning plan.

(6) As soon as possible following adoption of a zoning ordinance enacted pursuant to this act, the local unit of government shall submit a copy of the ordinance that it determines meets the requirements of this act to the department. If the local unit of government has an existing ordinance that it contends is at least as restrictive as the model zoning plan, that ordinance may be submitted to the department at any time. The department shall review zoning ordinances submitted under this section to assure compliance with this act. If the department finds that an ordinance is not in compliance with this act, the department shall work with the local unit of

government to bring the ordinance into compliance and inform the local unit of the failure to comply and in what ways the submitted ordinance is deficient. Unless a local unit of government receives notice within 90 days of submittal that the ordinance they submit to the department under this subsection is not in compliance with this act, the local unit of government shall be considered to be approved by the department.

(7) A local unit of government may adopt, submit to the department, and obtain approval of a zoning ordinance based on the model zoning plan or an equivalent ordinance as provided in this section by June 30, 1990. If a local unit does not have an approved ordinance by June 30, 1990, the department shall implement the model zoning plan for that local unit of government in the same manner and under the same circumstances as provided in subsection (4). Notwithstanding any other provision of this act, a local unit of government may adopt a zoning ordinance at any time, and upon the approval of the department, that ordinance shall take the place of the model zoning plan implemented by the department.

(8) If a local unit of government in which a proposed use is to be located does not elect to issue permits or does not receive approval of a zoning ordinance that regulates critical dune areas, the department shall implement the provisions of the model zoning plan in the place of the local unit of government and issue special exceptions in the same circumstances as provided in this chapter for the issuance of variances by local units of government.

(9) The department shall develop permit application forms to implement this section.

(10) The department shall assist local units of government in developing ordinances that meet the requirements of this act.

Sec. 18. (1) The lawful use of land or a structure, as existing and lawful within a critical dune area at the time the department implements the model zoning plan for a local unit of government, may be continued although the use of that land or structure does not conform to the provisions of the model zoning plan. The continuance, completion, restoration, reconstruction, extension, or substitution of existing nonconforming uses of land or a structure may continue upon reasonable terms that are consistent, to the extent possible, with the applicable zoning provisions of the local unit of government in which the use is located.

(2) The lawful use of land or a structure, as existing and lawful within a local unit of government that has a zoning ordinance approved by the department, may, but is not required by this act to, be continued subject to the provisions of law pertaining to existing uses within the act that enables that local unit of government to zone and the applicable zoning provisions of the local unit of government.

(3) A use needed to obtain or maintain a permit or license that is required by law to continue operating an electric utility generating facility that is in existence on the effective date of this section shall not be precluded under this act.

(4) Uses that have received all necessary permits from the state or the local unit of government in which the proposed use is located by June 15, 1989 or the effective date of this chapter, whichever is later, are exempt for purposes for which a permit is issued from the operation of this act or local ordinances approved under this act. Such uses shall be regulated pursuant to local ordinances in effect by that date.

Sec. 19. Upon adoption of an approved zoning ordinance, certified copies of the maps showing critical dune areas, and existing development and uses, shall be sent by the local unit of government to the state tax commission and the assessing office, planning commission, and governing board of the local unit of government, if requested by an entity listed in this section.

Sec. 20. (1) Except as provided in subsection (2), the following uses shall be prohibited in a critical dune area:

(a) A surface drilling operation that is utilized for the purpose of exploring for or producing hydrocarbons or natural brine or for the disposal of the waste or by-products of the operation.

(b) Production facilities regulated pursuant to the mineral well act, Act No. 315 of the Public Acts of 1969, being sections 319.211 to 319.236 of the Michigan Compiled Laws, and Act No. 61 of the Public Acts of 1939, being sections 319.1 to 319.27 of the Michigan Compiled Laws.

(2) Uses described in subsection (1) that are lawfully in existence at a site on the effective date of this chapter may be continued. The continuance, completion, restoration, reconstruction, extension, or substitution of those existing uses shall be permitted upon reasonable terms prescribed by the director.

Sec. 21. (1) A local unit of government, or the department if the local unit of government does not have an approved zoning ordinance, may establish a use permit and inspection fee.

(2) Fees collected by the department under this section shall be deposited in the state treasury and credited to the general fund to be used to defray the cost of administering this chapter and chapter 4.

(3) Fees collected by a local unit of government shall be credited to the treasury of the local unit of government to be used to defray the cost of administering uses under a zoning ordinance.

(4) In addition to fees provided for in this section, a soil conservation district may charge a separate fee to cover the actual expense of providing services under this act and for providing technical assistance and advice to individuals who seek assistance in matters pertaining to compliance under this act.

(5) A local unit of government, or the director if the local unit of government does not have an approved zoning ordinance, may require the holder of a permit issued by a local unit of government or the director to file with the local unit of government or the director a bond executed by an approved surety in this state in an amount necessary to assure faithful conformance with the permit.

Sec. 22. (1) If the director finds that a person is not in compliance with the model zoning plan if the department is implementing the provisions of the plan, or if the department is involved in the modification or reversal of a decision regarding a special use project as provided in section 40, the director may suspend or revoke the permit.

(2) At the request of the director or a person, the attorney general may institute an action for a restraining order or injunction or other appropriate remedy to prevent or preclude a violation of the model zoning plan if the department is implementing the provisions of the plan or if the department is involved in the modification or reversal of a decision regarding a special use project as provided in section 40. At the request of a member of the governing body of a local unit of government or a person, the county prosecutor may institute an action for a restraining order or injunction or other proper remedy to prevent a violation of a zoning ordinance approved under this act. This shall be in addition to the rights provided in the Thomas J. Anderson, Gordon Rockwell environmental protection act of 1970, Act No. 127 of the Public Acts of 1970, being sections 691.1201 to 691.1207 of the Michigan Compiled Laws, and as otherwise provided by law. An action under this subsection instituted by the attorney general may be instituted in the circuit court for the county of Ingham or in the county in which the defendant is located, resides, or is doing business.

(3) The department shall periodically review the performance of all local units of government that have ordinances approved under this chapter. If the department determines that the local unit of government is not administering the ordinance in conformance with this act, the department shall notify the local unit of government in writing of its determination, including specific reasons why the local unit of government is not in compliance. The local unit of government shall have 30 days to respond to the department. If the department determines that the local unit of government has not made sufficient changes to its ordinance administration or otherwise explained its actions, the director may withdraw the approval of the local ordinance and implement the model zoning plan within that local unit of government. If a local unit disagrees with an action of the department to withdraw approval of the local ordinance, it may appeal that action pursuant to the administrative procedures act of 1969, Act No. 306 of the Public Acts of 1969, being sections 24.201 to 24.328 of the Michigan Compiled Laws, in the manner provided in that act for contested cases.

(4) In addition to any other relief provided by this section, the court may impose on a person who violates this chapter or chapter 4, or a provision of a permit, a civil fine of not more than \$5,000.00 for each day of violation, or order a violator to pay the full cost of restabilization of a critical dune area or other natural resource that is damaged or destroyed as a result of a violation, or both. This subsection shall not take effect until 30 days after notification is mailed to individual property owners under section 16(1).

Sec. 23. (1) By June 15, 1991 a legislative study committee shall be created by the majority leader of the senate and the speaker of the house of representatives to report to the legislature on the issues listed in subsection (2). This legislative committee shall consist of 3 members of the house of representatives who shall be appointed by the speaker of the house of representatives and 3 members of the senate who shall be appointed by the majority leader of the senate. Of the members appointed, 2 of the members appointed from the senate and 2 of the members appointed from the house of representatives shall have critical dune areas within their districts. In addition, 1 of the committee members appointed from each house shall be a member of the standing committee of that house that addresses legislation pertaining to environmental protection and natural resources.

(2) The written report of the legislative committee shall be submitted to each of the members of the legislature by June 15, 1993. The report shall contain information and analyses of each of the following issues pertaining to the implementation of this chapter and chapter 4 and of zoning ordinances approved pursuant to this act:

(a) The accuracy and precision of the critical dune area designations in the "atlas of critical dune areas" dated February 1989.

(b) The number of use permits requested and the number of permits issued and denied under this act by the department and by local units of government.

(c) The number of requests for variances and the number of those requests that are denied by the department and by local units of government, including any pertinent pattern in the issuance or denial of variances by geographic areas of the state.

(d) The effectiveness of the criteria and standards in the model zoning plan, including but not limited to, slope and setback restrictions, vegetation removal, and erosion related measures.

(e) Whether the model zoning plan and approved ordinances are accomplishing the objectives of the act.

(f) Whether the law pertaining to the taking of private property for public use is being utilized due to the operation of the model zoning plan or approved zoning ordinances, and if takings are occurring whether there are apparent inequities.

(3) During its consideration of the issues listed in subsection (2), the legislative committee shall consult, at a minimum, with representatives from each of the following:

- (a) The public.
- (b) The Michigan townships association.
- (c) The Michigan municipal league.
- (d) A conservation organization.
- (e) An environmental protection organization.
- (f) Land development interests.
- (g) Construction industry interests.
- (h) The department.

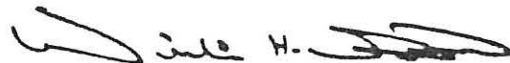
Section 2. This amendatory act shall not take effect unless Senate Bill No. 179 of the 85th Legislature is enacted into law.

Section 3. Sections 1a, 2a, 16, 17, 18, 19, 20, 21, 22, and 23 of Act No. 222 of the Public Acts of 1976 are repealed effective June 15, 1995.

This act is ordered to take immediate effect.



Clerk of the House of Representatives.



Secretary of the Senate.

Approved.....

.....
Governor.



VEGETATION AND WILDLIFE INVENTORY FOR ROSY MOUND
NATURAL AREA

CONTENTS

Biotic Communities at Rosy Mound, With Special Reference to
Items of Special Interest

Map 1. Topography

Map 2. Communities

Comparison of Rosy Mound's Forest With Other Dune Forests
on the East Side of Lake Michigan

Dune Plants of Southwest Michigan Also in Indiana, Where They're
Rare

Evaluation of Site Quality and Recommendations

Vascular Plants Observed at Rosy Mound, Spring and Summer, 1991

Birds Observed at Rosy Mound, Spring and Summer, 1991

Insect Specialties of the Open Sunes at Rosy Mound

Notes on Other Elements of the Rosy Mound Biota

References

Submitted July 19, 1991

Leon Schaddelee

BIOTIC COMMUNITIES AT ROSY MOUND, WITH SPECIAL REFERENCE TO ITEMS OF SPECIAL INTEREST

See species lists for scientific names.

1. OPEN DUNES. The Open Dune community is really two, the one dominated by beachgrass, the other by little bluestem.

a. BEACHGRASS COMMUNITY. This occurs on the foredunes just back from the beach, where the wind is strongest and the sand most subject to movement. The beachgrass has stabilized the sand, protecting the flats behind the foredune from blowing sand.

The beachgrass community is species-poor. Beachgrass forms almost a monoculture from which scattered sand cherries and cottonwoods protrude. Near the north end is a thicket of Bailey dogwood, in the middle a large colony of blueleaf willow. A characteristic shrub of this zone, dune willow (Salix syrticola) is apparently absent at Rosy Mound.

At the windward foot of the foredune (upper beach) is a narrow belt of distinctive vegetation which may be considered a subtype of the beachgrass community since the grass does extend into it, though not commonly. This zone is dominated by sea rocket, with bugseed and seaside spurge as major associates. Both the sea rocket and spurge, like the beachgrass, occur on the Atlantic shore as well as the Great Lakes but nowhere in between. Another Atlantic species, beach pea, is characteristic of the sea rocket zone and may be looked for, though I did not see it there. I found it growing rarely on top of the foredune. The sea rocket zone becomes visible only in late spring since the plants that compose it are annuals and spend much of the year as seeds, buried in sand.

Several other species may be found in the beachgrass community but not commonly. They are invaders from the next zone, where they are much more common and characteristic.

The only bird characteristic of the beachgrass community is the bank swallow, which nests in holes it excavates in the windward face of the dunes. Several insects are characteristic, especially the small sand wasp, slender beach tiger beetle, and seaside grasshopper, all of which are common to abundant and seen only during the summer. The tiger beetle is the only species I know of which is found only on the beach. It "is found in isolated colonies along the shore of Lake Michigan [north to Leelanau Co.] and is among the rarest of Michigan tiger beetles" (Graves, 1963). I looked for the white tiger beetle (Cicindela lepida), another rare species of the beachgrass community but couldn't find it.

b. LITTLE BLUESTEM COMMUNITY. This covers the large flat area between the foredune and high dunes. The presence of several weeds, a couple of which are abundant, suggests it may not be natural. Whether it was scoured out by wind or by people, the sand is now completely stabilized and protected from further scouring by the foredune. Little bluestem forms a "bunch grass" community here, the bare sand between the bunches colonized by bearberry and especially false heather. Locally the sand is encrusted by moss and lichen, most noticeably the British soldier (Cladonia cristatella) but mostly the sand is bare and loose. The number of species here, while greater than that of the beachgrass community, is still small but most of them are abundant and highly characteristic: sand reedgrass, switchgrass, sand cress, sand

cherry, dune grape, dune evening primrose, common milkweed, hairy puccoon, horsemint, and beach wormwood. Common weedy species are Canada bluegrass (a European native despite its common name) and sheep sorrel. The most interesting species here is the dune thistle, a Great Lakes endemic considered nationally (globally)-threatened (see Evaluation of Site Quality and Recommendations).

The bluestem community is being invaded by trees, mostly white pine (at the north end) and red oak (at the south end). Barring disturbance, the zone will succeed to the Oak Transition Community. Other tree species noted were red cedar, cottonwood, trembling aspen, black cherry, and basswood. The most characteristic woody species here is no doubt the common juniper.

The only birds I saw that are resident in this zone are the chipping sparrow and song sparrow. The prairie warbler used to nest in the bluestem zone of the southwest Michigan dunes but seems to have abandoned this habitat everywhere along our coast.

Many insect species here are common and widespread but several are more restricted, highly characteristic, and deserve special mention. The small sand wasp and seaside grasshopper of the Beachgrass Community are found just as commonly here. The common tiger beetle is the large; the bronze occurs as well but seems much rarer.

The only butterfly specialty I observed was the olympia marblewing, a small white species which flies for about a month beginning in late April. Its caterpillars feed on the sand cress so abundant here. The butterflies represent the dune form, restricted to sand dunes along Lakes Michigan and Huron (see Wagner, 1977). Other butterflies observed: American copper (Lycaena phlaeas), tiger swallowtail (Pterourus glaucus), monarch (Danaus plexippus), painted lady (Vanessa cardui), buckeye (Junonia coenia), large wood nymph (Cercyonis pegala), and a large fritillary (Speyeria).

Another insect specialty of this zone is the giant robber fly, which in Michigan is entirely restricted to Lake Michigan dunes. This is the big, fearsome-looking fly with the long orange abdomen, so visible in July. A third is the mottled sand grasshopper, which has wings colored in flight like the seaside grasshopper's but is easily distinguished in hand by its darker coloration, with heavy black spotting, the thin, high keel on top of its thorax, and orange tibia on its hind legs.

2. FOREST. The forest at Rosy Mound was originally, like most dune forest in southwest Michigan, a special subtype of the Southern Mesic Forest (Beech-Maple Forest) which is the climatic climax over most of the southern Great Lakes region. What distinguishes this subtype from typical beech-maple is, more than anything else, the significant presence of hemlock. So important is this species that one is tempted to treat dune forest as a southern extension of Northern Mesic Forest (Hemlock-White Pine- Northern Hardwoods). It is perhaps better, however, not to do so since so many of the common species of that forest are missing, among them yellow birch and paper birch in the overstory (though yellow birch does occur rarely and locally south to Berrien County), striped and mountain maples in the understory, and the shinleaf (Pyrola) and clubmosses (Lycopodium) in the ground layer. Like the yellow birch, some of the northerners do occur rarely in the southwest Michigan dunes, among them two species at Rosy Mound, the gaywings and north-

ern spring beauty. It may be useful to think of dune forest as a community transitional between Northern and Southern Mesic Forest, in which elements of both occur side by side. (Typical southern species at Rosy Mound not found in Northern Mesic Forest include spring beauty, spicebush, and sassafras.)

The same north-south mix shows up in the birds as well. At Rosy Mound the southern red-bellied woodpecker and hooded warbler nest with northerners like the veery, black-throated green warbler, and magnolia warbler. In the dune forest of Allegan County (Saugatuck) the blackburnian warbler of the north nests regularly and I would expect it at Rosy Mound, though it eluded me there. With it is sometimes found a warbler from the south, the worm-eating. This species is much rarer in Michigan and I would not expect to find it at Rosy Mound, though one should certainly keep an eye (and ear) out for it.

We have no examples of virgin forest in the southwest Michigan dunes to use as a benchmark for evaluating the second-growth stands we have. Just what the climax will look like, towards which these forests are progressing, we can't say. At Rosy Mound at present the sugar maple seems to be the one most important species, though red oak is a strong second, and beech, black cherry, sassafras, white ash, and hemlock are common. (In the northern part sassafras may even codominate.) Basswood and white pine seem somewhat less common and butternut is rare. Smaller understory trees are hop hornbeam, alternateleaf dogwood, and downy shadbush. Woody vines are riverbank grape and Virginia creeper.

As succession proceeds we can expect to see the beech join the maple as a codominant and most of the other species drop in importance. I suspect the sassafras will be eliminated completely except in treefall openings. Hemlock will continue to codominate on (especially north-facing) slopes. The role of red oak in the climax forest is not clear. In typical Southern Mesic Forest it is no more important than the other subsidiary species like black cherry, white ash, and the hickories (which, by the way, seem absent in dune forest). However, in the dune subtype red oak may continue to play a codominant role, especially on the ridges where somewhat drier conditions prevail, (though even on the ridgetops the sand is moist not very far down and there is surprisingly little difference between the vegetation there and on the valley floors).

The tall shrub layer is dominated by, in addition to tree saplings (especially maple), witch hazel. The chief low shrub is mapleleaf viburnum. Less common are spicebush, pasture gooseberry, chokecherry, leatherwood, red honeysuckle, Canada honeysuckle, and red elderberry.

The ground flora as in all mesic forest is rich and includes several spring ephemerals, species which bloom before the trees leaf out, fruit quickly, and then die back completely to their underground parts. These include the yellow trout lily, the two spring beauties, squirrel corn, Dutchman's breeches, and cutleaf toothwort. The most interesting spring flower is the northern or Carolina spring beauty, which extends south along the Lake Michigan coast as far as Ottawa County (Voss, 1985). The southernmost station I know of is in the Sunset Hills area just two miles south of Rosy Mound.

Spring wildflowers which do not die back but remain green throughout the summer include jack-in-the-pulpit, great white trillium, large bellwort, false Solomon's seal, Canada mayflower, columbine, roundlobe hepatica, blue cohosh, bloodroot, the violets, wild sarsaparilla, and sweet cicely. The creeping shrub called running strawberrybush is common. Fern diversity is surprisingly poor, the only common species being marginal woodfern.

Scarcely any flowers bloom once spring is over, but towards the end of summer a second, much lesser bloom season begins, dominated by composites (bigleaf aster, bluestem goldenrod, white lettuce, and perhaps white snake-root).

a. OAK TRANSITION COMMUNITY. Although the oak's importance in the forest may well be artificial, a product of man, along the edge where forest and open dunes meet, it is no doubt natural. I have observed the same situation throughout the southwest Michigan dunes. Red oak dominates a narrow transitional community in which forest and open dune species merge and there are even a few species which seem entirely restricted to it. Since most plants here belong to the forest, it seems right to consider this a forest subtype, which I am calling the Oak Transition Community.

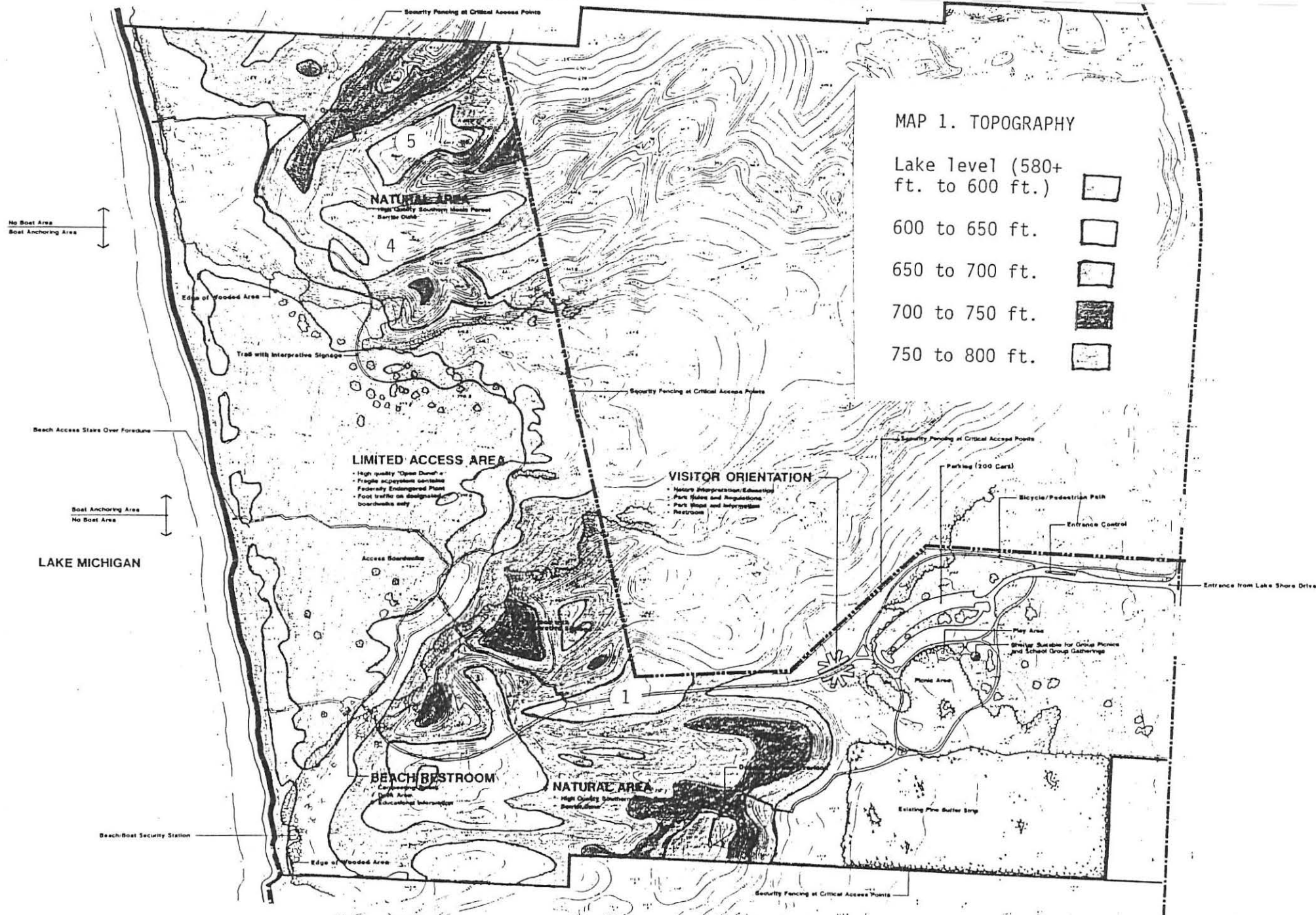
Other trees which seem especially common and characteristic are sassafras and white pine. Additional characteristic species are brachen, Canada yew, starry false Solomon's seal, greenbrier, pasture rose, gaywings, poison ivy, bittersweet, wood betony, and northern bush honeysuckle. Most of these are rare or absent in the open dunes or in the forest proper.

Of these the most interesting is gaywings. Rosy Mound is the southernmost Michigan locality for this species that I know of. It appears again in Indiana, where it grows in one place in the dunes of Porter County (Swink, 1979) and is listed as state-endangered.






Other unusual species are characteristic of this zone but were not detected at Rosy Mound. In the Saugatuck dunes, for example, a small section of Oak Transition Community harbored the following, all rare in the dunes: pink lady's slipper (Cypripedium acaule), Drummond's rockcress (Arabis drummondii), pipsissewa (Chimaphila umbellata), spotted wintergreen (Chimaphila maculata), one-sided shinleaf (Pyrola secunda), and pinesap (Monotropa hypopithys).

The Oak Transition is a narrow community, roughly 100 to 300(400) feet in width. I believe it owes its existence to storm winds, which blow away fallen leaves while blowing in loose sand, thus discouraging soil litter and inhibiting soil development. Species which grow well here prefer part-sun, part-shade and soil with less humus, nutrients, and moisture than in the forest, though more than in the open dunes.

No doubt there are a number of animal species (insects especially) which are characteristic and even restricted to this zone, but I did not detect any except for the hognose snake, which is probably characteristic, entering both forest and open dunes but preferring the partial shade of the transition.

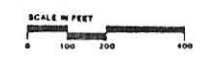


MAP 1. TOPOGRAPHY

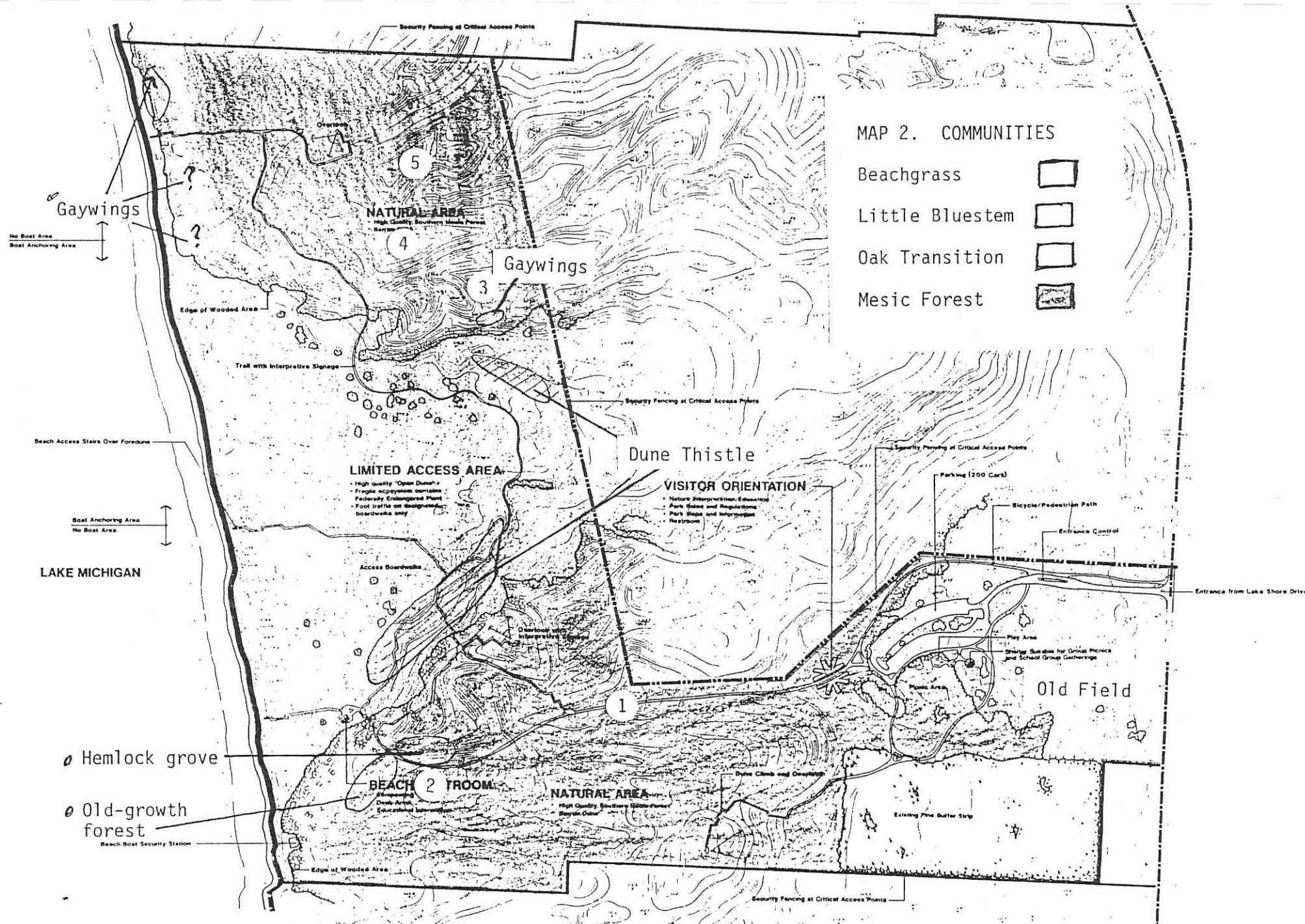
- Lake level (580+ ft. to 600 ft.) 
- 600 to 650 ft. 
- 650 to 700 ft. 
- 700 to 750 ft. 
- 750 to 800 ft. 

ROSY MOUND NATURAL AREA

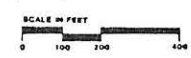
OTTAWA COUNTY, MICHIGAN



M.C. SMITH & ASSOCIATES, INC.
LANDSCAPE ARCHITECTS & LAND PLANNERS
PARK TREATMENT PLANNERS



ROSY MOUND NATURAL AREA
OTTAWA COUNTY, MICHIGAN



M.C. SMITH & ASSOCIATES, INC.
 LANDSCAPE ARCHITECTS & LAND PLANNERS
 PARK PLANNERS

COMPARISON OF ROSY MOUND'S FOREST WITH OTHER DUNE FORESTS ON THE EAST SIDE OF LAKE MICHIGAN

The Indiana dunes, at the south end, have as climax vegetation a xerophytic forest dominated by black oak in which blueberry and huckleberry form a low shrub layer. Their proximity to the Tallgrass Prairie province accounts for many prairie species in their flora, largely absent in Michigan. Mesophytic forest such as occurs at Rosy Mound is found only in small pockets where "special topographic and microclimatic conditions" allow it (Olson, 1958). Hemlock does not occur in the Indiana dunes.

The same black oak forest continues into Michigan, though with the prairie element much reduced--as, for example, at Grand Beach. However, it soon gives way to mesophytic forest dominated by beech and maple, in which hemlock now occurs but usually not as a co-dominant. An excellent virgin-forest example can be seen at Shorewood Hills north of Harbert, in a creek-cut ravine where hemlock is so common it co-dominates with beech and maple and a typically southern species, the tulip tree. Beech-maple forest continues north through Warren Dunes State Park and the Mt. Edwards area just to the north of Warren Dunes (Wells & Thompson, 1982). At Grand Mere near Stevensville, an Indiana dunes-type forest dominated by black oak again occurs, with mesophytic conditions only in isolated pockets in the dune valleys; one difference from Indiana is the presence here of hemlock. A consistent hemlock associate from Berrien County north is the Canada yew, also absent in the dunes to the south (Swink, 1979).

I believe Grand Mere is the last outpost of black oak forest. From there on north, dune forest is, as far as I can tell, mesophytic and dominated by beech, maple, and starting at Saugatuck, hemlock--and by red oak on dunes that have been cut over and are succeeding to climax. Naturally, the presence of northern species increases the farther north you go. The distribution of many of them, however, appears not to be continuous, and certain southern dune forests may host more northern species than some to the north! (although some of this spottiness may be more apparent than real. Rare species are characterized not only by being few and far between but by being easily overlooked!) I have found one-sided shinleaf, for example, at Saugatuck and again at Kitchel Dune/North Shore Preserve but nowhere in between. And though I've seen large shinleaf as far south as southern Berrien County (it's also in the Indiana dunes), I have yet to see it in most dunes to the north--until Muskegon County, where it suddenly becomes common.

Some northerners are wetland species in the dunes of southwest Michigan, though in northern Michigan they may occur in mesophytic forest. At Grand Mere a cold conifer swamp at the base of a black oak-forested dune has bluebead, bunchberry, pink shinleaf, goldthread, starflower, and purple avens. At the North Shore/Kitchel Dune Preserve north of Grand Haven, a swale mostly wet (though the northerners were growing where it was dry) has pink shinleaf, green shinleaf, one-sided shinleaf, and the southernmost station of twinflower I know of. Twinflower is known historically from sites as far south as northern Indiana, where it is considered extinct (Swink, 1979).

Two northerners apparently reaching their southern limit just south of Grand Haven are the northern, broadleaf, or Carolina spring beauty and the gaywings or fringed polygala. If they occur at Hofmaster State Park to the north, I have yet to find them there. Gaywings becomes abundant at Muskegon State Park, where we pick up the first example of a forest type common in the northern Lower Peninsula. It is xerophytic like the black oak forest but is dominated by white pine, white oak, and bigtooth aspen, with heath shrubs and bracken dominating near the ground. This is the kind of second growth which appears after a forest of white pine is logged off. A number of wildflowers common in the northern L.P. but rare in the southern L.P. are abundant in this forest. In a wet swale at Muskegon State Park grows the sweetgale, a shrub which may well be at its southern limit here.

The spotty distribution of certain northerners along the east coast of Lake Michigan is well illustrated by jack pine, typically not a forest constituent but found in moist swales between the foredunes and larger forested dunes. Jack pine is one of the few northerners to be found in Indiana. It is absent in Berrien and Van Buren Counties but shows up in Allegan County, at Saugatuck. It then skips another stretch of coast to appear again in the Grand Haven area (e.g. Kitchel Dune/North Shore). It is common at Muskegon State Park.

North of Frankfort (Benzie County), the first balsam fir and white spruce, dominant members of true Boreal Forest, show up in dune forest. Here they grow with white cedar, a northerner which occurs spottily south to Warren Dunes State Park (Olson, 1958). At Sleeping Bear Dunes National Lakeshore (Benzie and Leelanau Counties) occur both mesophytic forest and the acid xerophytic forest found at Muskegon State Park. I explored a tract of old-growth Northern Mesic Forest in the dunes just to the west of Leelanau State Park and was intrigued by the similarities and differences with our own southwest Michigan dune forests. Species found here but not at Rosy Mound (or most other sites in southern Michigan) included red pine and paper birch in the upper story, striped maple in the understory, bluebead and starflower in the ground layer. In the narrow ecotone between forest and open dunes the beech, maple, and hemlock were joined by white cedar, and here were found Canada buffaloberry, roundleaf shadbush, and twinflower. Other mesophytic northerners in the area (according to Thompson, 1967) are green bracted orchid, small rattlesnake plantain, large rattlesnake plantain, yellow birch, red baneberry, foamflower, and one-sided shinleaf.

DUNE PLANTS OF SOUTHWEST MICHIGAN ALSO IN INDIANA, WHERE THEY'RE RARE

The great majority of these are northern (especially Northern Mesic Forest) species reaching their southern limit in northern Indiana.
Some of these (like Canada Yew) are in Indiana but not in the dunes.

Ext. = Extinct E = Endangered T = Threatened SC = Special Concern

Indiana Status (Bacone & Hedge, 1980)

Actaea rubra (Red Baneberry)	T
Adlumia fungosa (Allegheny Vine)	Ext.
Arabis drummondii (Drummond's Rockcress)	E
* A. glabra (Tower Mustard)	SC
* Arctostaphylos uva-ursi (Bearberry)	SC
Betula papyrifera (Paper Birch)	T
* Cakile edentula var. lacustris (Great Lakes Sea Rocket)	T
* Carex arctata (Drooping Wood Sedge)	E
* C. eburnea (Bristleleaf Sedge)	E
* C. pedunculata (Longstalk Sedge)	E
Chimaphila umbellata (Pipsissewa)	SC
* Cirsium pitcheri (Dune Thistle)	T
Clintonia borealis (Bluebead; Beadlily)	Ext.
Cornus canadensis (Bunchberry)	E
* C. rugosa (Roundleaf Dogwood)	T
Epigaea repens (Trailing Arbutus)	T
* Euphorbia polygonifolia (Seaside Spurge)	T
* Geranium robertianum (Herb Robert)	E
Habenaria hookeri (Hooker's Orchid)	E
H. orbiculata (Roundleaf Orchid)	E
H. viridis var. bracteata (Green Bracted Orchid)	SC
* Hudsonia tomentosa (False Heather)	T
* Juniperus communis var. depressa (Common Juniper)	T
* Lathyrus japonicus [maritimus] var. glaber (Beach Pea)	E
Linnaea borealis (Twinflower)	E
* Lonicera canadensis (Canada Honeysuckle)	E
Lycopodium clavatum (Running Ground Pine)	E
L. obscurum (Ground Pine)	E
L. tristachyum (Ground Cedar)	E
* Oryzopsis asperifolia (Whitegrain Mountain Rice)	E
* O. racemosa (Blackgrain Mountain Rice)	E
Pinus banksiana (Jack Pine)	SC
* Polygala paucifolia (Gaywings; Fringed Polygala)	E
Polygonella articulata (Jointweed)	T
Populus balsamifera (Balsam Poplar)	E
Pyrola asarifolia (Pink Shinleaf)	E
P. elliptica (Large Shinleaf)	T
P. rotundifolia (Roundleaf Shinleaf)	T
P. secunda (One-sided Shinleaf)	E
P. virens (Green Shinleaf)	E
Salix cordata [syrticola] (Dune Willow)	T
* Schizachne purpurascens (False Melic)	E
Shepherdia canadensis (Canada Buffaloberry)	Ext.
* Solidago spathulata [racemosa] var. gillmani (Dune Goldenrod)	T
* Taxus canadensis (Canada Yew)	SC
Thuja occidentalis (White Cedar; Arbor Vitae)	E
Utricularia subulata (Pin Bladderwort; Closed B.)	E

* Found at Rosy Mound

EVALUATION OF SITE QUALITY AND RECOMMENDATIONS

The easternmost part of the property is old field, highly degraded, the forest soil gone and with it the forest herbs. The bare sand has been colonized by weeds and certain dune plants. Trees have invaded and begun the process of soil-building. Forest like the original will return but in several hundred years, perhaps a thousand or more. This is not a natural area and any intensive development (parking lots, buildings) obviously ought to be placed here.

The forest ranges from degraded to moderately natural, old-growth, approaching presettlement conditions. Both extremes can be seen in the southern part, where heavy logging in 1990/91 opened up large parts of the forest to the sun. These areas are dominated by weedy species which are rare in virgin forest but experience an incredible population explosion when disturbance occurs: fringed bindweed, pokeweed, blackberry and raspberry. These are native weeds. Several alien species occur as well, especially mullein and motherwort, though not nearly so abundantly. The hollow labeled #1 on the maps has been clearcut and is now a tangle of slash and weeds. Although the hollow's beauty is gone, I suggest that the plan to route a trail through it be carried out: it would provide an excellent opportunity to observe the changes which will take place, starting from a known year, as succession progresses, and at the same time a striking contrast to what the visitor will see in the next hollow. The forest will return much more quickly here than in the old field, since the soil is intact. In 50 to 100 years it will look much like the woods in the north part of the preserve. If decision-making is dictated by aesthetic considerations, an alternative trail can be placed along the top of the ridge to the south, allowing a look down into the hollow and at the same time, into a small but nicely-wooded hollow to the south.

While the bottom of Hollow #2 shows the effects of recent logging, its western slope offers a small example of old-growth forest, the best on the property. I measured the diameter at breast height (dbh) of several of the largest trees, as follows:

- white ash - 27 inches
- butternut - 21 (a nearby butternut on the hollow's floor was 28)
- sugar maple - 28
- beech - 21
- black cherry - 20
- hemlock - 24

The trail as planned will afford a look at this stand, plus a fine hemlock grove on the north (south-facing) slope. Two Northern Mesic Forest herbs, northern spring beauty and herb-robert, grow in the hollow and may also be seen from the trail, as well as northern warblers; (the magnolia was seen in the old-growth stand, the black-throated green in the hemlock grove).

On flat surfaces within the forest a regular trail paved with wood chips will probably suffice, but on slopes wooden steps will have to be installed to prevent erosion. I do not see the need for boardwalk trails in the forest.

In the open dunes, however, it's another matter. Even though the Bluestem Community is flat, the vegetation is sparse and fragile and the sand loose, so that trampling and the consequent loss of plants is a real potential problem. People are more inclined to stay on a boardwalk trail than on a regular trail. It is important for them to do so not only to protect the vegetation in general but one species in particular, the dune thistle.

The population of this species at Rosy Mound is small but healthy and not particularly vulnerable because the plants aren't clumped but scattered, mostly on and along the base of the dunes along the east edge of the bluestem flat. The only real danger from people is large numbers of them moving through the area, such as we see at places like our recreation-oriented state parks. Crowds of people would churn up the sand, dislodging the plants and wiping them out in no time.

I estimated about 40 plants in the summer of 1991, most of them young specimens which did not bloom this year. (The thistle is an indeterminate biennial, growing for three to ten years, then flowering and dying. In a healthy population where reproduction is occurring, most of the plants should not be blooming in any given year.) Dune thistle populations may be subject to some fluctuation, I don't know; it seems to me there were many more plants when I visited the site in 1972 but I made no count then on which to base an estimate and my perception may be faulty. In any case, based on what I observed in 1991, the population can tolerate some small loss but not much and certainly needs to be protected from trampling. A longterm threat is found in the succession taking place on the bluestem flat. Once the trees here reach the size and density needed to block off the wind, keeping it from affecting the inland dunes where the thistle grows, the vegetation on these dunes will change and thistle habitat will be lost. If you want to keep the plant you may have to cut down the trees at some point in the future.

It should be pointed out that the thistle population may extend into the high, bare dunes just to the east of the preserve and may be larger than I think. If plants are there, I doubt that there are very many; dune thistle doesn't normally grow so far inland from the lake. Someone should check it out though.

In the mesic forest north of the Bluestem Community a trail system already exists and I would use it rather than develop a new one. The ridge which borders the open dunes is forested with Oak Transition and along the trail at its top, near the preserve's eastern border (see map) one can easily see gaywings associating with whitegrain mountain rice, bristleleaf sedge, and wood betony. Should the decision be made to use this trail, great care must be taken in improving (widening) it so as to avoid destroying this interesting assemblage. I believe all the gaywings were on the north edge of the trail, so it should be widened along the south edge.

The forest in this northern part is in a middle stage of succession, well-advanced though still showing the effects of past logging. There are very few large trees and no stands of them; sassafras and red oak are abundant; blackberry and fringed bindweed, two weedy sun-loving species, have not yet been shaded out (though pokeweed has) and are still quite common though depauperate, not robust as in the newly-cleared southern part. The logging roads, though covered with forest vegetation, are quite recognizable.

Gaywings occurs again in the northwest corner of the preserve, just north of the wooden steps. Whether it also grows anywhere south of the steps I don't know, since I did not get into that area on May 11 when the plants were blooming and easily seen. Someone will have to check it out next May. For all I know, gaywings may be found throughout the Oak Transition.

I question the advisability of the plan's three dune overlooks. The forest will obstruct any view, necessitating the construction of towers which seem to me an obtrusion on the natural scene, the benefit of which does not outweigh the disadvantage. One dune overlook is enough.

Summary: Rosy Mound does not rank with the best of southwest Michigan dune natural areas (Warren Dunes, Saugatuck), mostly because it lacks wet pannes or other aquatic habitats, which would add greatly to its plant and animal diversity. It is missing certain forest and open dune species found elsewhere, though no area has all the dune species, and Rosy Mound has gaywings and northern spring beauty which the others apparently lack. Except for the dune thistle, no federally- or state-rare species occur; (I would have expected the ginseng). The condition of the forest is for the most part unimpressive, though it's no worse than most of our dune forests. At least the original species are still there and will, given time, rearrange themselves to fit the original pattern. The trees will once again attain the stature and splendor of which they're capable. Rosy Mound promises to be in the future a finer natural area than it is now.

The preserve is large enough to provide significant habitat for wildlife, especially important for those birds whose numbers are dwindling due to habitat loss, especially on their wintering grounds though here in the north as well. (See the bird species list for their names.) The county should try to buy additional acreage on adjoining land, to protect even more habitat.

VASCULAR PLANTS OBSERVED AT ROSY MOUND, SPRING AND SUMMER, 1991

1. Families are listed in the order that they appear in Gleason's The New Britton and Brown Illustrated Flora, 1952.
2. Presence status is noted for most species. This designation is based on what I observed on the property, i.e. "rare" means rare at Rosy Mound according to my perception.
3. Alien (weed) spp. are noted with an "A".
4. While the list is close to complete, I'm sure several more species could be added, all of which are either rare (highly localized) or more common but easily overlooked (some of the grasses and sedges).
5. Community abbreviations: F = Forest OF = Old Field
 OT = Oak Transition
 B = Beachgrass
 LB = Little Bluestem

Lycopodiaceae

Lycopodium lucidulum (Shining Clubmoss) F, rare

Equisataceae

Equisetum hiemale (Rough Horsetail) LB, rare

Ophioglossaceae

Botrychium virginianum (Rattlesnake Fern) F, rare

Polypodiaceae

Adiantum pedatum (Maidenhair Fern) rare, F (Hollow #5)

Dryopteris marginalis (Marginal Wood Fern) F, com. (abun.)

D. spinulosa (Spinulose Wood Fern) F, rare (Hollow #5)

Pteridium aquilinum (Bracken) OT, com.

Taxaceae

Taxus canadensis (Canada Yew) OT, rare(uncom.)

Pinaceae

Juniperus communis var. *depressa* (Common Juniper) LB, com.

J. virginiana (Red Cedar) rare, LB & OT

Pinus strobus (White Pine) uncom. to com., LB, OT, F

Tsuga canadensis (Canada Hemlock) com., F (slopes, esp. n.-facing)

Gramineae

Ammophila breviligulata (Beachgrass) B, dom.

Andropogon scoparius (Little Bluestem) LB, dom.

A *Bromus inermis* (Smooth Brome) rare, LB

B. pubescens [purgans] (Woodland Brome; Canada B.) F, rare (uncom.?)

Calamovilfa longifolia var. *magna* (Sand Reedgrass) B, LB, OF, com./abun.

This variety is a Great Lakes endemic.

Elymus canadensis (Canada Wild Rye) LB, rare (uncom.?)

Festuca obtusa [nutans] (Nodding Fescue) F

Hystrix patula (Bottlebrush Grass) F, rare

Muhlenbergia tenuiflora (Slender Satingrass) F, uncom.

Oryzopsis asperifolia (Whitegrain Mountain Rice) com., OT, F

O. racemosa (Blackgrain Mountain Rice) F, uncom./com.

Panicum virgatum (Switchgrass) com., LB, OF

A *Poa compressa* (Canada Bluegrass) LB, abund.

P. saltuensis F

- Schizachne purpurascens (False Melic) F
- Cyperaceae
- Carex albursina (White Bear Sedge) F
- C. arctata (Drooping Wood Sedge) F
- C. eburnea (Bristleleaf Sedge) local, F (ridgetops esp.)
- C. laxiflora (Wood Sedge) F
- C. merritt-fernaldii F
- C. muhlenbergii (Sand Sedge) LB, rare
- C. peckii (Peck's Sedge) F
- C. pedunculata (Longstalk Sedge) F
- C. pensylvanica (Pennsylvania Sedge) com., F, OT
- C. brevior F
- Araceae
- Arisaema atrorubens [triphyllum] (Jack-in-the-pulpit) F, uncom.
- Liliaceae
- Erythronium americanum (Yellow Trout Lily) F
- Maianthemum canadense (Canada Mayflower) F, OT, abun.
- Polygonatum pubescens [biflorum] (Downy Solomon's Seal) F, com.
- Smilacina racemosa (False Solomon's Seal) F, abun.
- S. stellata (Starry False Solomon's Seal) OT, com.
- Smilax ecirrata (Upright Carrion Flower) F, com.
- S. lasioneura (Common Carrion Flower) F, uncom.?
- S. rotundifolia (Greenbrier; Catbrier) F, OT, local
- S. tamnoides var. hispida (Bristly Greenbrier) F, uncom.?
- Trillium grandiflorum (Great White Trillium) F, com.
- Uvularia grandiflora (Largeflower Bellwort) F, com.
- Orchidaceae
- No orchids were seen during the survey, though Goodyera pubescens (Downy Rattlesnake Plantain) was seen in 1972. My notes from the 70's also tell me that Habenaria orbiculata (Roundleaf Orchid) occurs, but I don't remember it.
- Salicaceae
- Populus deltoides (Cottonwood) B, LB, com.
- P. tremuloides (Trembling Aspen) LB, rare
- Salix glaucophylloides (Blueleaf Willow) B (one big colony on top of foredune, near middle; heavily infested by some caterpillar)
- Juglandaceae
- Juglans cinerea (Butternut) F, rare (Hollow #2)
- Betulaceae
- Ostrya virginiana (Hop Hornbeam; Ironwood) F, com.
- Fagaceae
- Fagus grandifolia (American Beech) F, com.
- Quercus rubra (Red Oak) LB, OT, F, abun.
- Ulmaceae
- Ulmus americana (American Elm) forest edge
- Urticaceae
- Laportea canadensis (Wood Nettle) F, local but com. where found
- Polygonaceae
- Polygonum cilinode (Fringed Bindweed) abun., F (esp. where recently cut)
- A Rumex acetosella (Sheep Sorrel) OF, LB, abun.
- Phytolaccaceae
- Phytolacca americana (Pokeweed) abun., F (s. part, where just logged)
- Portulacaceae
- Claytonia caroliniana (Northern Spring Beauty) F, local (e.g. Hollow #2)
- C. virginica (Spring Beauty) F, abun.
- Chenopodiaceae
- Corispermum hyssopifolium (Common Bugseed) com., B, LB

Caryophyllaceae

- A *Lychnis alba* (White Campion) F, rare along trail
 A *Saponaria officinalis* (Soapwort; Bouncing Bet) uncom., OF, LB
Silene antirrhina (Sleepy Catchfly) OF

Ranunculaceae

- Actaea pachypoda* (White Baneberry; Doll's Eyes) F, com.
Aquilegia canadensis (Canada Columbine) F, abund.
Hepatica americana (Roundlobe Hepatica) F, com.
Ranunculus abortivus (Kidneyleaf Buttercup) F
Thalictrum dioicum (Early Meadowrue) F, com.

Berberidaceae

- Caulophyllum thalictroides* (Blue Cohosh) com., F
Podophyllum peltatum (May Apple) F, local

Lauraceae

- Lindera benzoin* (Spicebush) F, rare
Sassafras albidum (Sassafras) abund., F, OT

Papaveraceae

- Dicentra canadensis* (Squirrel Corn) abund., F
D. cucullaria (Dutchman's Breeches) abund., F
Sanguinaria canadensis (Bloodroot) F, uncom.

Cruciferae

- Arabis canadensis* (Sicklepod) F, uncom.
A. glabra (Tower Mustard) OF, OT, F along trails, com.
A. lyrata (Sand Cress) abund., LB, OT
Dentaria laciniata (Cutleaf Toothwort) F, local
 A *Lunaria annua* (Honesty; Moneyplant)

Saxifragaceae

- Mitella diphylla* (Bishop's Cap; Miterwort) F, com.?
Ribes cynosbati (Pasture Gooseberry) F, com.

Hamamelidaceae

- Hamamelis virginiana* (Witch Hazel) abund., F, OT

Rosaceae

- Amelanchier arborea* (Downy Shadbush) uncom., F, OT
Prunus pumila (Sand Cherry) abund., B, LB
P. serotina (Black Cherry) com., F, OT
P. virginiana (Chokecherry) com., F, OT
Rosa carolina (Pasture Rose) uncom., OT
Rubus allegheniensis (Blackberry) abund. in F where recently logged
R. idaeus (Red Raspberry) com. in F where recently logged

Fabaceae

- Lathyrus japonicus* var. *glaber* (Beach Pea) B, rare

Geraniaceae

- Geranium robertianum* (Herb Robert) rare, F (e.g. Hollow #2)

Polygalaceae

- Polygala paucifolia* (Gaywings; Fringed Polygala) uncom., OT

Euphorbiaceae

- Euphorbia polygonifolia* (Seaside Spurge), com., B, LB

Anacardiaceae

- Rhus radicans* (Poison Ivy) loc. com., LB, OT

Celastraceae

- Celastrus scandens* (Bittersweet) loc. com., LB, OT
Euonymus obovatus (Running Strawberrybush) com., F

Aceraceae

- Acer saccharum* (Sugar Maple) F, OT, abund. (dom.)

- Vitaceae
Parthenocissus quinquefolia (Virginia Creeper) F., com.
Vitis riparia (Riverbank Grape) F, OT, com.
 var. *syrticola* (Dune Grape) B, LB, com.
- Tiliaceae
Tilia americana (Basswood) F, uncom.
- Cistaceae
Hudsonia tomentosa (False Heather) abund., LB
- Violaceae
Viola pubescens (Yellow Violet) F
V. rostrata (Longspur Violet) F
V. sororia (Hairy Wood Violet) F
- Thymeleaceae
Dirca palustris (Leatherwood) F, rare (easily distinguished by its many leaf-miner blotches)
- Onagraceae
Circaea quadrisulcata [lutetiana] (Enchanter's Nightshade) F, com. (abun.)
Oenothera oakesiana (Dune Evening Primrose; Oake's E.P.) LB, com.
- Araliaceae
Aralia nudicaulis (Wild Sarsaparilla) F, OT, com.
- Umbelliferae
Osmorhiza claytoni (Sweet Cicely) F, abund.
- Cornaceae
Cornus alternifolia (Alternateleaf Dogwood) F, uncom.
C. rugosa (Roundleaf Dogwood) rare, OT
C. stolonifera f. *baileyi* (Bailey Dogwood) rare, B (one colony on top of foredune near n. end)
- Ericaceae
Arctostaphylos uva-ursi (Bearberry) abund., LB, OT
Monotropa uniflora (Indian Pipe) F, uncom.
- Oleaceae
Fraxinus americana (White Ash) F, com.
- Asclepiadaceae
Asclepias syriaca (Common Milkweed) com., OF, B, LB
A. verticillata (Whorled Milkweed) rare, LB (one area by pines)
- Boraginaceae
Lithospermum croceum (Hairy Puccoon) abund., LB
- Labiatae
A Leonurus cardiaca (Motherwort) F, along trails, occ.
Monarda punctata var. *villicaulis* (Horsemint) abund., LB
- Scrophulariaceae
Linaria canadensis (Old Field Toadflax) OF
Pedicularis canadensis (Wood Betony; Lousewort) com., OT, F (ridgetops esp.)
A Verbascum thapsus (Mullein) F, along trails, uncom.
- Orobanchaceae
Epifagus virginiana (Beechdrops) F
- Phrymaceae
Phryma leptostachya (Lopseed) F, occ.
- Rubiaceae
Galium aparine (Cleavers) F, local
G. circaezans (Wild Licorice) F, com.
G. lanceolatum (Lanceleaf Wild Licorice) F
G. triflorum (Sweet-scented Bedstraw) F, com. (abun.)
Mitchella repens (Partridgeberry) uncom., F (ridgetops esp.)

Caprifoliaceae

- Diervilla lonicera* (Northern Bush Honeysuckle) OT, rare or local
Lonicera canadensis (Canada Honeysuckle; American Fly H.) F, uncom.
L. dioica (Red Honeysuckle; Mountain H.) F, uncom.
Sambucus pubens (Red Elderberry) F, uncom.
Viburnum acerifolium (Mapleleaf Viburnum) F, OT, abun.

Compositae

- Antennaria neglecta* (Cat's Foot) OT, local
Artemisia caudata (Beach Wormwood) B, LB, com.
Aster macrophyllus (Bigleaf Aster) F, com.
 A *Centaurea maculosa* (Spotted Knapweed) OF, LB (rare)
Cirsium pitcheri (Dune Thistle; Pitcher's T.) LB, uncom.
Eupatorium rugosum (White Snakeroot) F
 probably; this plant was identified by vegetation only
 A *Hieracium* sp. (Hawkweed) OF, LB (rare)
 A *Hypochoeris radicata* (Cat's Ear) OF
Krigia virginica (Dwarf Dandelion) OF, LB
Lactuca canadensis (Wild Lettuce) OF
Prenanthes alba (White Lettuce; Lion's Foot) F, com. (abun.?)
Solidago caesia (Bluestem Goldenrod) F, com. (abun.?)
S. racemosa [spathulata] var. *gillmani* (Dune Goldenrod) B, LB, com.
 This variety is a Great Lakes endemic.
 A *Taraxacum officinale* (Dandelion) F along trails, uncom.
 A *Tragopogon* sp. (Goat's Beard) OF, LB (rare)

Totals: 57 families
 155 species

BIRDS OBSERVED AT ROSY MOUND, SPRING AND SUMMER, 1991

1. Gull, probably Ring-billed. Flying by just offshore. Resident.
2. Hawk, probably Red-tailed. 1, flying over, 5/25, 6/14 Resident.in area.
3. Red-bellied Woodpecker. 1, n. part. Resident.
- * 4. Eastern Wood Pewee. Summer breeder.
5. Bank Swallow. 3 or 4, foredune. Probably 1 or 2 pairs nesting.
6. American Crow. 1 Resident.
7. Blue Jay. Resident.
8. Black-capped Chickadee. Resident.
9. Tufted Titmouse. Resident.
10. White-breasted Nuthatch. Resident. N. and s. parts.
11. Gray Catbird. 1, n. part.
- * 12. Veery. 1, s. part. Probable nester.
- * 13. Wood Thrush. 1, s. part. Nester.
- * 14. Red-eyed Vireo. N. & s. parts, probably 3 or 4 pairs nesting.
- * 15. Black-throated Green Warbler. The common warbler, 2 or 3 pairs probably nesting in s. part, at least 1 in n. part.
- * 16. Black and White Warbler. Probable nester, s. part.
- * 17. Magnolia Warbler. Seen both in migration and summer breeding season (1 male in old-growth on w. slope of Hollow #2), probable nester.
- * 18. Chestnut-sided Warbler. At least 1 pair nesting in cut-over area in s. **
- * 19. American Redstart. At least 1 pair nesting in cut-over area in s. **
- * 20. Hooded Warbler. Seen in migration, heard in summer breeding season, probable nester.
- * 21. Ovenbird. Heard both n. and s. in summer nesting season, probably breeding. The occurrence in the s. was actually off the proposed preserve.
22. Northern Cardinal. Heard in s. Resident.
23. Indigo Bunting. In cut-over area in s. Probably 2-4 pairs nesting. **
24. Rose-breasted Grosbeak. At least 1 pair in n., 1 pair in s., probably breeding.
25. White-throated Sparrow. Common in woods on 5/11, in migration.
26. Chipping Sparrow. In Little Bluestem Community, more than 1 pair, breeding.
27. Song Sparrow. In Little Bluestem Community, perhaps only 1 pair, resident.

The interesting feature here is the presence of seven warblers in the summer breeding season; at least one more (the Blackburnian) should occur. (Several additional warblers will of course occur in the spring, in migration, although I did not see them on May 11 when I should have.)

* One of 57 North American species which overwinter in mature tropical forest and are declining in number because of deforestation; considered "at grave risk." (Audubon, May 1990)

** These spp. were actually observed off the property, to the northeast of Hollow #1.

Several other species resident and breeding no doubt occur. During the spring migration one should be able to add many more (e.g. on May 15, 1971 I saw, in addition to several of those listed above, yellow-rumped, golden-winged, Nashville, Cape May, and Blackburnian warblers and the scarlet tanager).

INSECT SPECIALTIES OF THE OPEN DUNES OBSERVED AT ROSY MOUND

Orthoptera

- Spharagemon collare* ssp. *wyomingianum* (Mottled Sand Grasshopper) LB, com.
Trimerotropis maritima ssp. *interior* (Seaside Grasshopper) B, LB, com.
The subspecies is a Great Lakes endemic.

Neuroptera

- Myrmeleon immaculatus*, probably (Antlion) LB, prob. also OT, occ.

Coleoptera

- Cicindela formosa* ssp. *generosa* (Large Tiger Beetle) LB, OF, com. from 5/11 on
An eastern subsp. of a western species.
C. macra [*cuprascens*] ssp. *macra* (Slender Beach Tiger Beetle) B, abund. 7/8, 7/15
(beach only)
C. scutellaris ssp. *lecontei* (Bronze Tiger Beetle) LB, rare (uncom.?) 5/11
Another eastern subsp. of a western species.
Of the two other shore tiger beetles, *C. hirticollis* does not occur because of the absence of wetpannes; *C. lepida*, a local sp., may or may not.

Lepidoptera

- Euchloe olympia* (*Olympia* Marblewing) LB, com. 5/11

Diptera

bee fly

bee fly

bee fly

- Efferia albibarbis* (Whitebeard Robber Fly) LB, occ.

- Proctacanthus hinei* (Giant Robber Fly) LB, com. 7/8, rare 7/15

- Stichopogon argenteus* (Silver Robber Fly) B, rare 7/15 (1 seen)

Hymenoptera

- Ammophila* sp. (Thread-waisted Wasp) LB, rare 6/14

- Anoplius*, probably *cylindricus* (Small Spider Wasp) B, LB, com. 6/14, less com. 7/8 and 7/15

- Microbembix monodonta* (Small Sand Wasp) B (including beach), LB, abund.
By far the most common hymenopteran of the dunes, and perfectly harmless; it lacks a stinger and provisions its larvae with insects it finds dead (it's a scavenger!).

wasp

wasp

NOTES ON OTHER ELEMENTS OF THE ROSY MOUND BIOTA

Bryophyte and fungi visibility and diversity seemed to me unusually poor. I noticed very little (although I'm sure an expert in the field would have seen much more!) and did not identify any (except for the one species most likely to attract the attention of a visitor, the British soldiers lichen mentioned in the Biotic Communities section, under Little Bluestem Community).

The only mammals observed were:

Eastern Chipmunk (*Tamias striatus*) Forest; heard much more than seen, by far the most "visible" mammal.

Black Squirrel (*Sciurus carolinensis*) Forest; rare (seen once in the woods, a couple of times outside the woods around homes). Probably the most interesting mammal at Rosy Mound, this is a color phase of the Eastern Gray Squirrel apparently absent from most parts of the state but common in Ottawa County near Lake Michigan. Since both gray and black squirrels occur in the same litter, the gray phase should occur as well.

Whitetail Deer (*Odocoileus virginianus*) Forest; rare (seen twice)

The only herptiles observed were:

American Toad (*Bufo americanus*) Forest; rare (seen twice)

With no ponds on the property (or even close by) for toads to breed in, one wonders where they came from, how far they had to travel to get there.

Eastern Hognose Snake (*Heterodon platyrhinos*) Oak Transition; rare (one seen). Feeds on the toads.

I was surprised to find no redback salamanders in the forest--a very characteristic species there.

No attempt was made to survey the forest butterflies but these were noted in passing:

Northern Pearly Eye (*Enodia anthedon*)

Red Spotted Purple (*Basilarchia astyanax*)

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Exhibit 2 - Existing Park Plan

Motor vehicle parking fees are in effect from Memorial Day weekend through Labor Day.

Rosy Mound Natural Area

Lake Michigan Coastal Greenway

Rosy Mound Natural Area
(164 Acres)

Legend

	Swimming Beach		Scenic Views
	Handicapped Access		Paved Surface
	Picnic Area		Concrete Surface
	Parking Area		Natural Surface Path
	Hiking Trail		Paved Path
	Trailhead Kiosk		Boardwalks/Bridges
	Modern Restroom		Crushed Stone
	Rustic Restroom		On-Grade Stairs
	Fee Station		Stairs
			.34 Distance in Miles
			Trail Map Location

Park User Information

- Park Hours:
March 1 to October 15 - 7:00 a.m. to 10:00 p.m.
October 16 through February - 7:00 a.m. to 8:00 p.m.
- Stay on trails to protect the fragile dunes
- Dogs are not allowed at any time
- No alcohol is permitted
- Bicycles are allowed on paved trails only
- No motor vehicles beyond parking lot
- No camping or fires
- No hunting
- No lifeguards on duty
- Swim at your own risk
- No smoking on beach
- All Ottawa County Park rules & regulations are in effect on park property

N



0 112.5 225 450 675 900 Feet



Ottawa County Parks & Recreation Commission

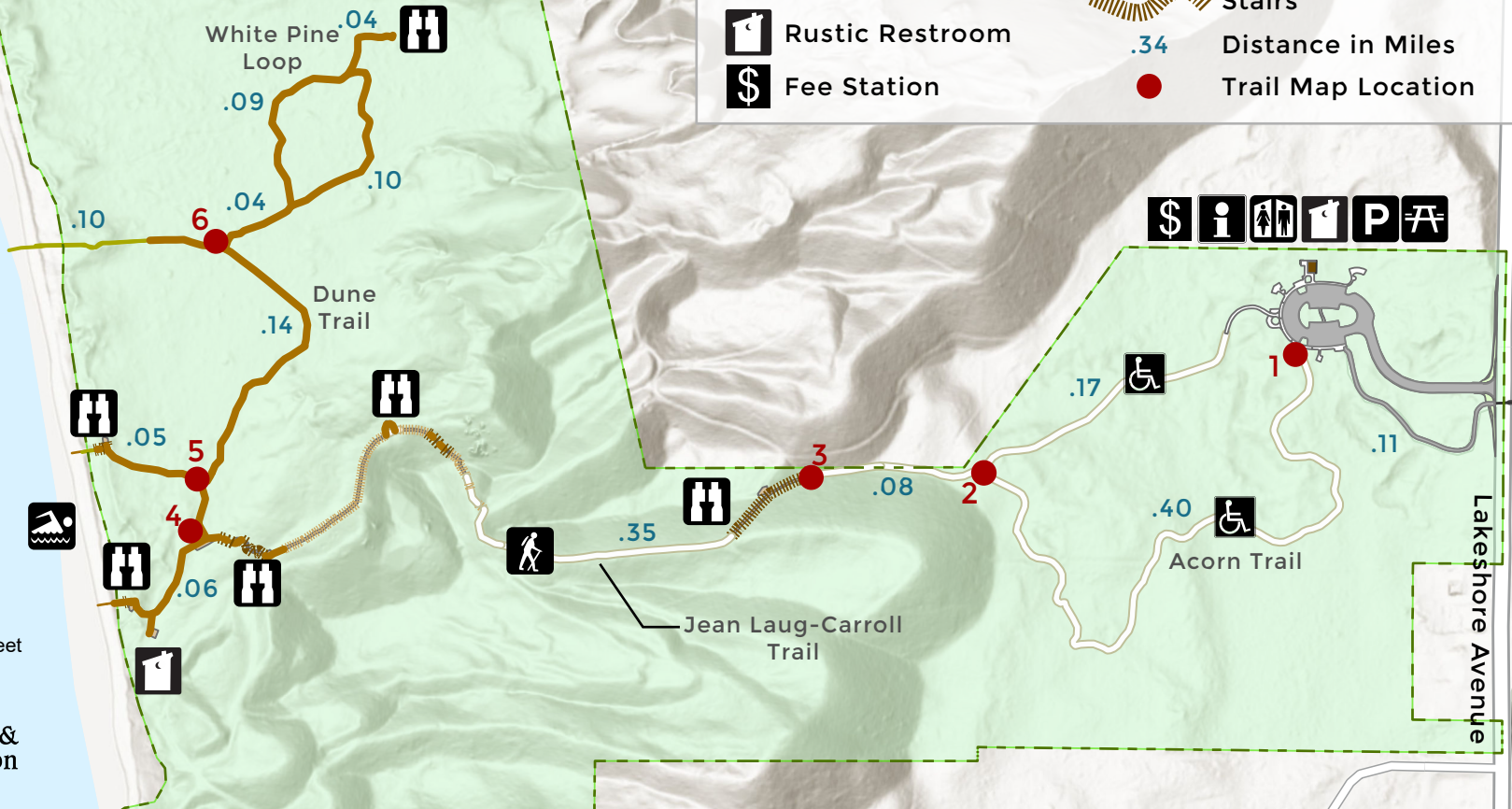


Exhibit 3 - Acquisition Area

Legend

- Parcels Lines
- Planned Acquisition (127 Acres)
- County & Local Parks

Rosy Mound
Natural Area
(Ottawa County Parks)

TACOMA LLC
70-07-04-100-025

TACOMA LLC
70-07-05-200-012

Rosy Mound Dr

Lakeshore Dr

SB US-31

172nd Ave
US-31

Rosy Mound Ln

Lake Sedge Dr

Cottage Dr

Pine Bluff Ct

ROSY MOUND EXPANSION PROJECT SITE MAP



1 inch = 600 feet

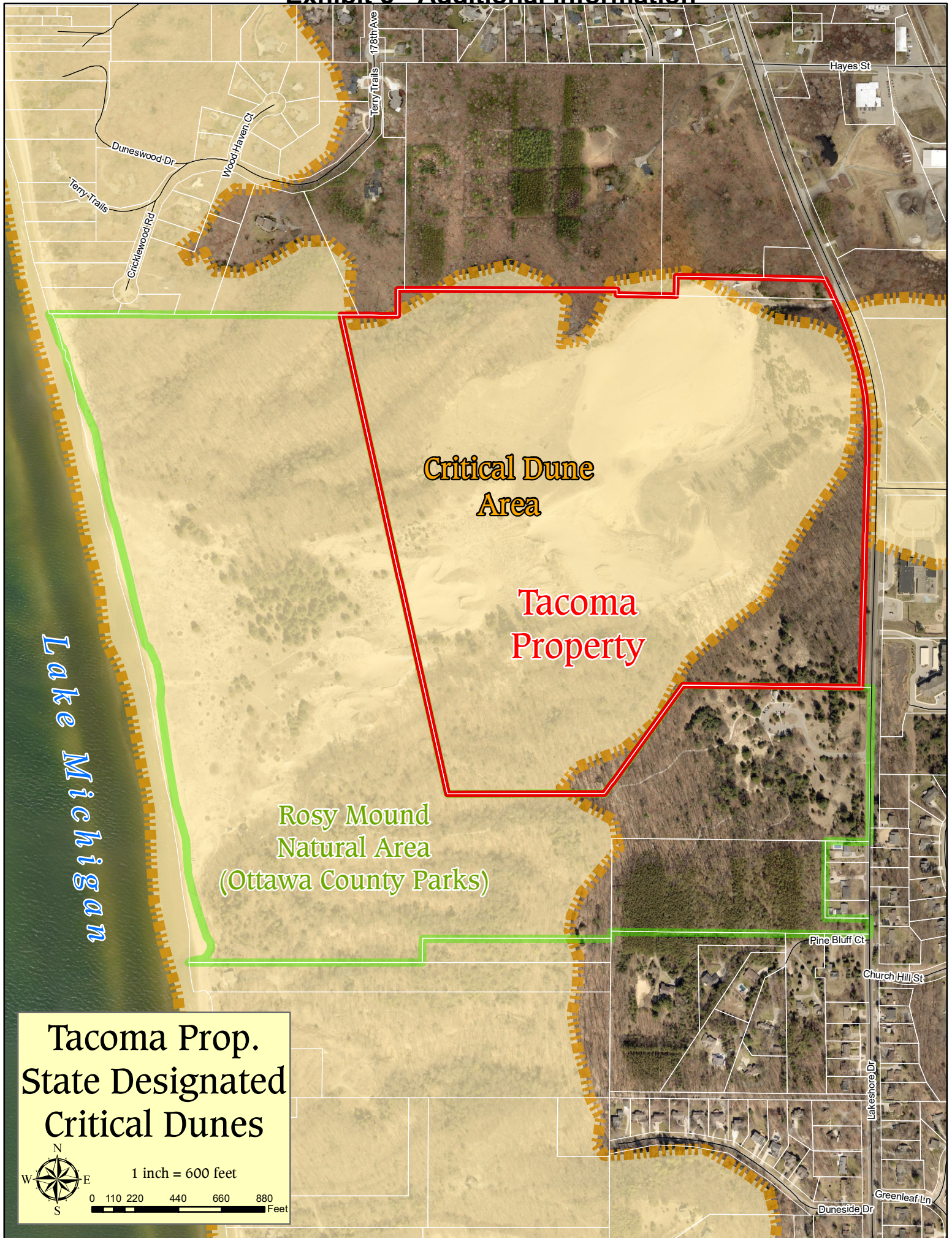


Exhibit 4 - Project Schedule


Rosy Mound Natural Area Master Plan Update Draft Proposed Timeline - June 14, 2024

- June 27, 2024** RFP for consultant services released
- July 16** Proposals due
- July 24** Consultant selection at Parks Commission meeting
- August 13** Consultant Contract Approved by County Board
- August 20** Planning process begins – Inventory/Analysis, Concept Development
- September 3 Parks Planning Committee Input, Stakeholder Engagement
- October 1 Parks Planning Committee Review
- October 23 Parks Commission meeting discussion/preliminary review
- October 29** Public Input Open House – Concepts
- November 5 Parks Planning Committee Review
- November 20 Parks Commission meeting/discussion/comments
- November 26** Public Presentation - Preferred Plan
- December 3 Parks Planning Committee Review
- December 11** Draft Master Plan Report Complete
- December 18 Parks Commission meeting review/comments
- January 7 Parks Planning Committee Review
- Jan. 15, 2025** Final Master Plan Report Complete
- January 22 Parks Commission meeting and formal adoption of plan
- February 19 Grant application approved by Parks Commission
- March 4 Grant application approved by County Planning Committee
- March 11 Grant application approved by County Board
- April 1, 2025 Submit MNRTF Grant

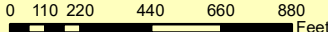
Exhibit 5 - Additional Information



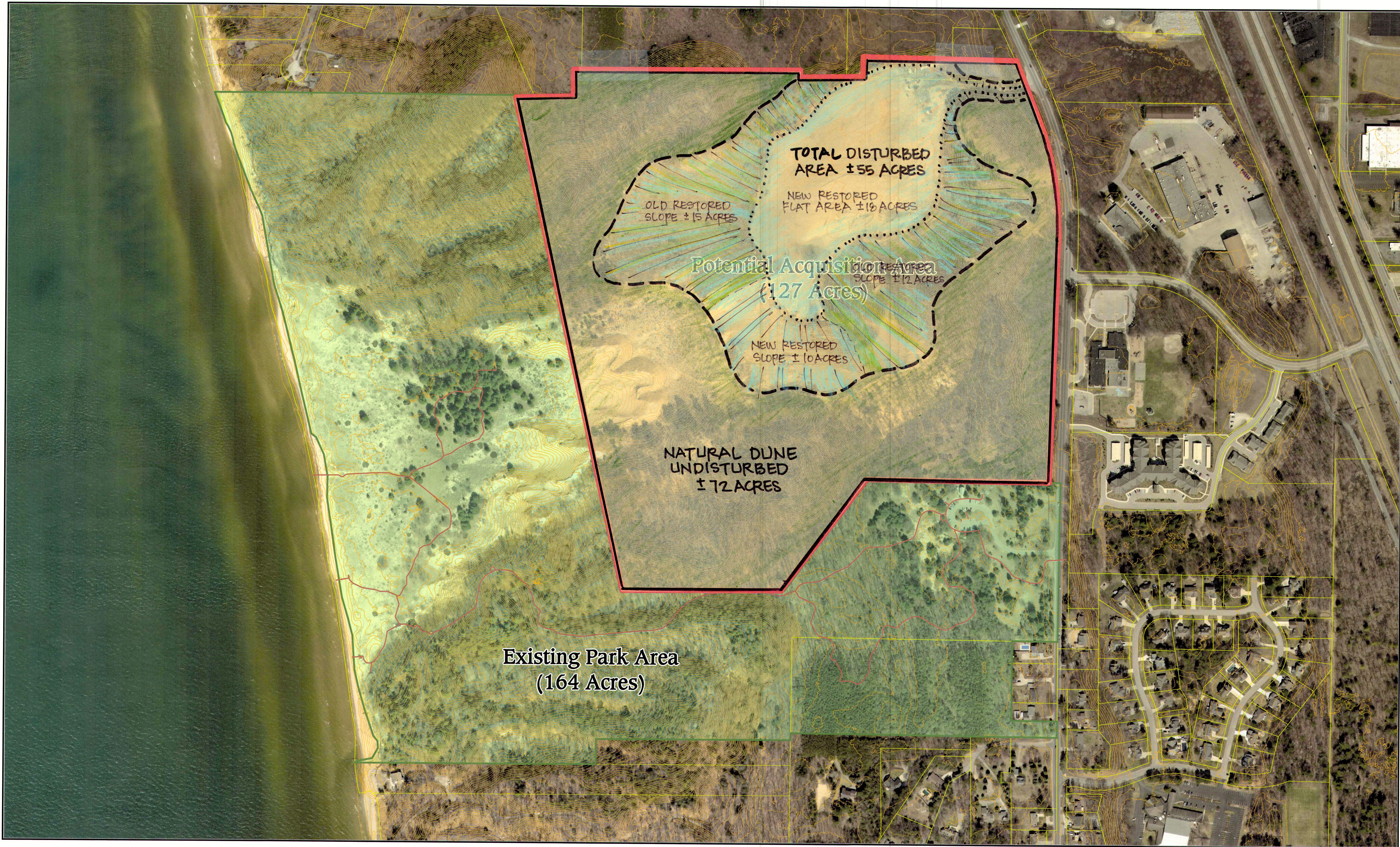
**Tacoma Prop.
State Designated
Critical Dunes**



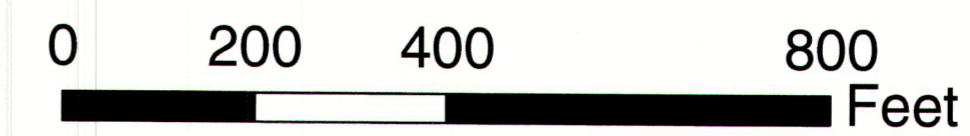
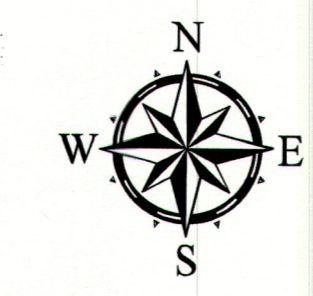
1 inch = 600 feet

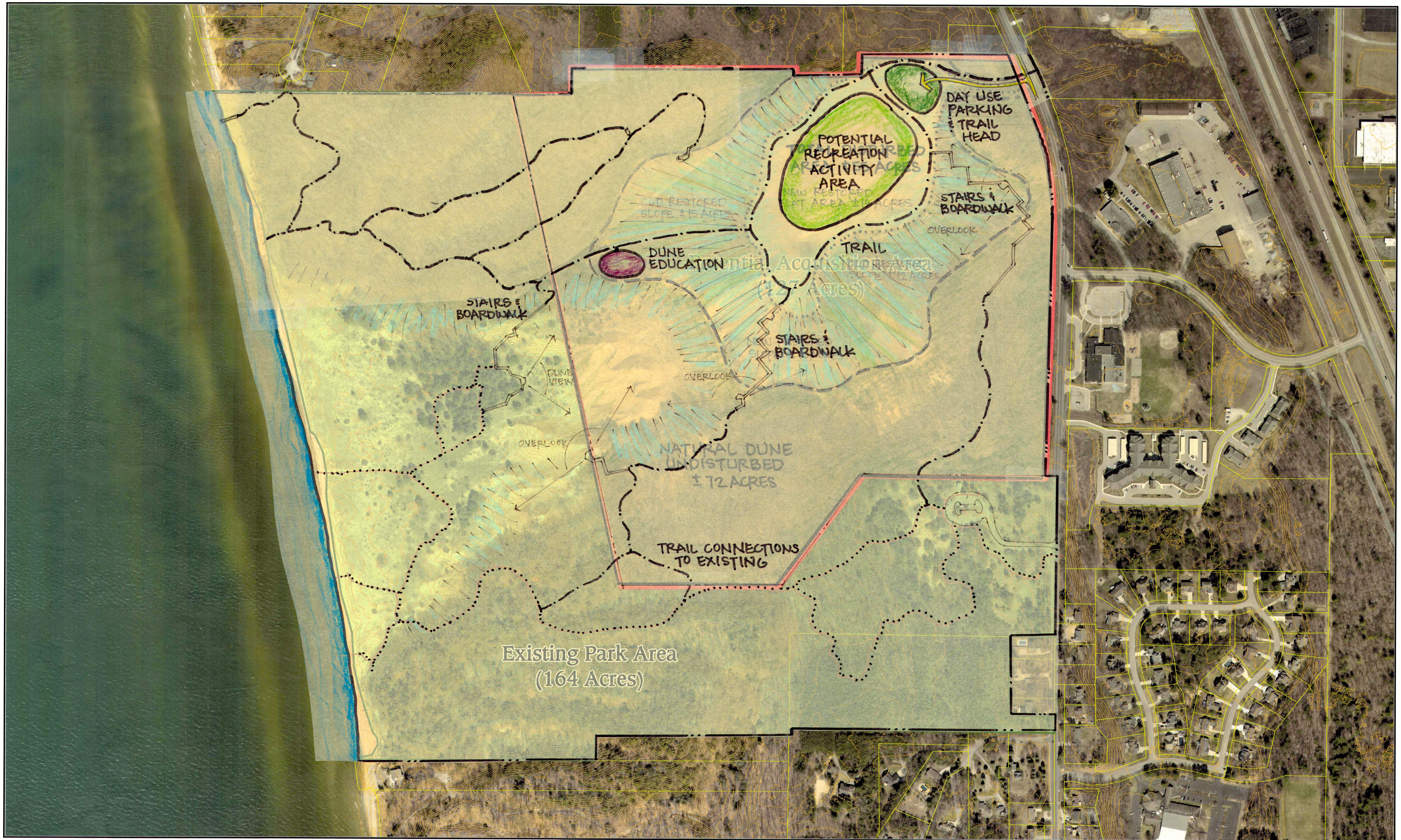


0 110 220 440 660 880 Feet



**Potential Acquisition Area
Rosy Mound Natural Area**





Potential Acquisition Area
Rosy Mound Natural Area

