

ELOSP - Environmental Interpretation

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Eastern Lake Ontario

# DUNE AND WETLAND ENVIRONMENTAL INTERPRETIVE CENTER

A Feasibility Study and Concept Plan



Prepared for Seaway Trail, Inc.

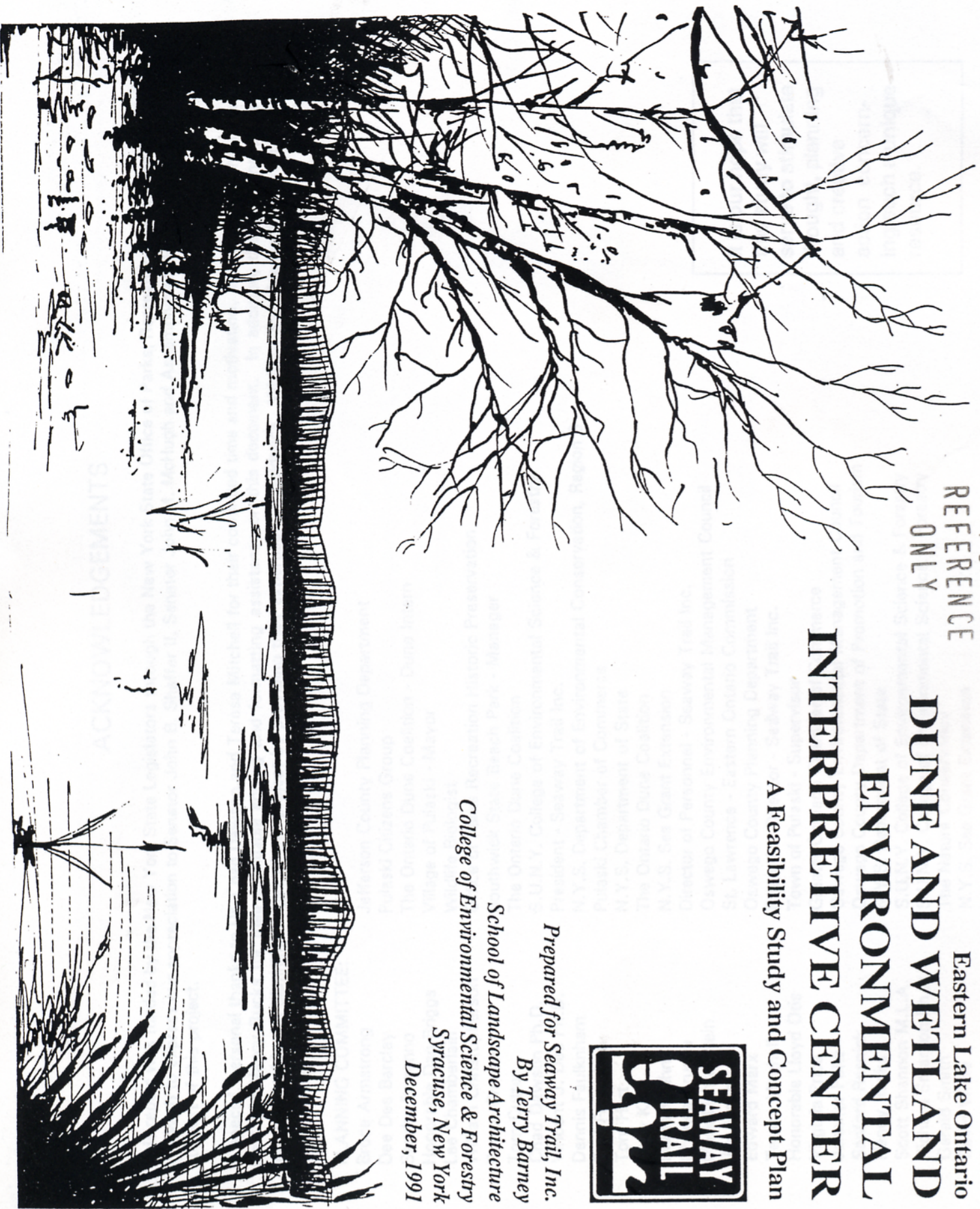
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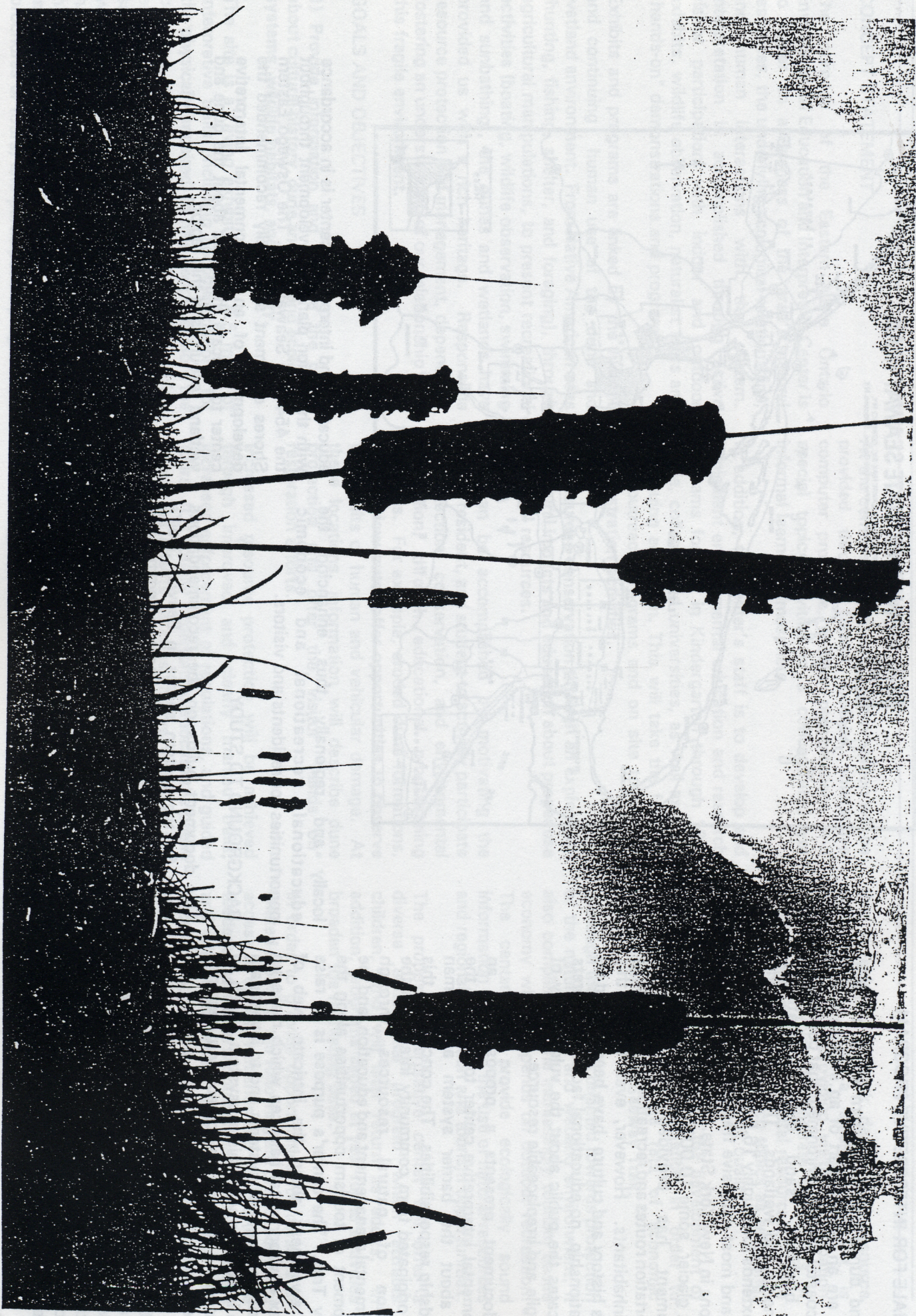
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It is our hope that this study will serve to stimulate thought, planning and creative action concerning such a unique resource.

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FEASIBILITY AND CONCEPT PLAN



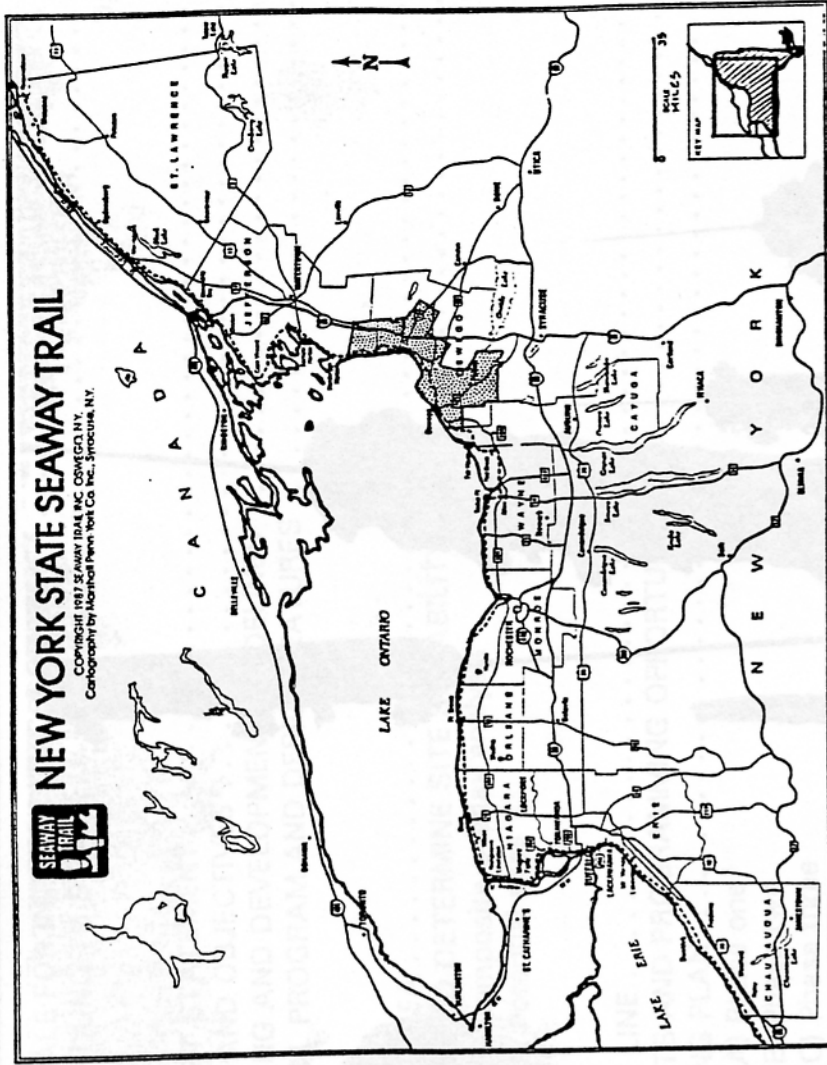
# INTRODUCTION

## RATIONALE FOR INTERPRETIVE PROGRAM

The sand dunes on the eastern shore of Lake Ontario are an integral part of an important and unique coastal barrier environment that consists of sandy beaches, sand dune formations, embayments and wetlands. This barrier system, which extends for roughly 16.5 miles, contains the largest and most extensive freshwater sand dune formations in New York State. Since the retreat of the last glacier, some 10,000 years ago, this rich environment has provided food, shelter, transportation routes and recreational opportunities to its inhabitants. However, even though this region's history and culture have been shaped by this relationship, no educational facility interprets or educates the public about the vulnerability of this fragile and irreplaceable resource.

This document presents a proposal for an environmental interpretive center to educate the public about the barrier system and human stewardship responsibilities. The concept for this center originated from community interest in the protection of natural resources through environmental management and education, and the development of tourism opportunities along the Seaway Trail. The center's purpose is to raise public awareness about the intricate web of complex environmental balances which make up the dune and wetland systems and to investigate human interaction with this ecosystem. Such an understanding is crucial to appreciating, restoring and preserving this rich resource.

A centrally located environmental education and interpretive center along the Eastern Lake Ontario shoreline would complement the existing educational and tourism facilities along the historic and recreational Seaway Trail. In addition, it would provide recreation and tourism information, both



locally and regionally thus enhancing the educational, recreational and economic opportunities for residents and visitors.

## BACKGROUND TO STUDY

This document builds on the recommendations made for the eastern shores in Seaway Trail's 1990 *Oswego Eastern Shores Communities Tourism Development Plan: Resource Document* and the *New York's Eastern Lake Ontario Sand Dunes: Resources, Problems and Management Guidelines*. The concept of an environmental

education and interpretive center is in accordance with the action plan for development throughout the 454 mile Seaway Trail. The Oswego Eastern Shores document specifically recommended the development of an environmental interpretive center to educate the public about the dune and wetland resources of this region.

This study will describe the physical analysis which determines the location and feasibility of a Dune and Wetland Environmental Interpretive Center and propose a conceptual design plan and overall program for the facility.

# PROGRAM

## CONCEPT STATEMENT

The purpose of the Eastern Lake Ontario Environmental Education and Interpretive Center is to foster an awareness of the area's natural resources, the underlying ecological relationships, and human interactions with the system. Interpretation is accomplished through active visitor participation with indoor and outdoor exhibits, wildlife observation, naturalist tours and "hands-on" demonstrations and programs.

Exhibits and programs are linked by the historic and continuing human use of the dune and wetland environment. From Native American uses (hunting, fishing, shelter, and foraging), through agricultural manipulations, to present recreational activities (boating, wildlife observation, swimming and sunbathing), the dunes and wetlands have provided us with a rich heritage. Responsible resource protection and management, depends on fostering an understanding of our relationship with this fragile environment.

## GOALS AND OBJECTIVES

1) Provide information and educate the public about cultural history, dune and wetland ecological systems, wildlife habitats, and geology.

The site is a "living exhibit" using 4.5 miles of interpretive trails (including accommodations for the physically impaired) to help people explore the beauty and variety of these sensitive environments. Areas such as the lake, beach, sand dunes, marshes, and varied forest and wetland types are visited, while bird and wildlife habitat, unique geological formations, cultural history, and unique scenic overviews are interpreted through kiosks, exhibits, interpretive brochures or tours, and participation programs.

At the center's main facility, interpretation will be provided through formal exhibits, interactive computer programs, theater presentations and special topic activities in a concentrated yet informal learning atmosphere.

In addition, the center's staff is to develop and implement environmental education and research programs for use in Kindergarten through 12th grade, colleges and universities, as well as adult continuing education. This will take the form of both outreach programs and on site tours with demonstration activities.

2) Encourage conservation through an exploration of cultural impacts and education about proper use of natural resources.

This can be accomplished by motivating the visitor, resident, and student to actively participate in protection, conservation, and environmental restoration, through educational programming activities. For example, eroded dune formations, called "blow outs" offer opportunities to observe the results of human and vehicular damage. At these locations, information will describe dune protection and offer the visitor "hands on" restoration efforts.

Increased resource protection will be achieved through improved and clearly marked trails, increased enforcement of regulations, and guided tours. It is equally important to educate the public about the effects of consumptive activities and disruptive impacts to wildlife habitats. This includes recreational impacts as well as agricultural wetland drainage, wetland sediment loading and non-point source pollution.

Lastly, it is crucial that the center teaches by establishing a positive example. On a large scale,

this is evident by park design and resource management. On a smaller scale, it is demonstrated by providing visitor participation opportunities which demonstrate the effects of human consumption of natural resources. These programs can focus on such topics as recycling, composting, and water and air quality.

3) Increase tourism through the development of high quality, themed destination in order to increase and stabilize the rate of economic development along the Seaway Trail.

Although the center is oriented towards protection of the natural dune and wetland environment, it also compliments the increasingly tourism based economy which depends on outdoor recreation. The center will provide ecologically sound information regarding the use of natural resources and regional recreation and tourism opportunities.

The proposed interpretive center will offer a diverse educational program which attracts children, who will later return as adults. In addition, programs aimed at year-round activities broaden the marketing base.

In order to provide opportunities for persons of limited mobility, the following are proposed: visual access to dunes, wetlands and wildlife (e.g., bird feeder observation windows); handicapped parking and wheelchair access to buildings; special boat access through wetland areas; a loop trail designed for visually and physically impaired visitors; and, a wheelchair accessible boardwalk trail with an observation blind in the marsh area.

Meeting these objectives will increase tourism in the area, however, it is crucial that the quality of life is protected, and improved by careful planning and incremental development.

PLANNING AND DEVELOPMENT GUIDELINES

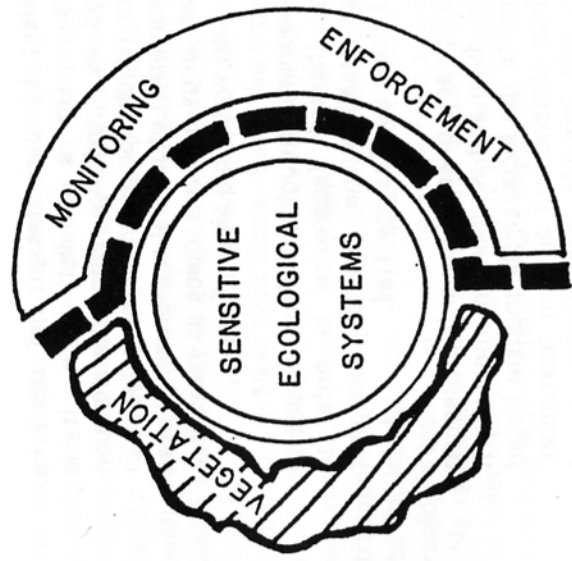
To gain community support, an ecologically sound study was encouraged by using the following planning and development concepts as guidelines.

- 1) Protect sensitive ecological systems from extensive development and consumptive use.

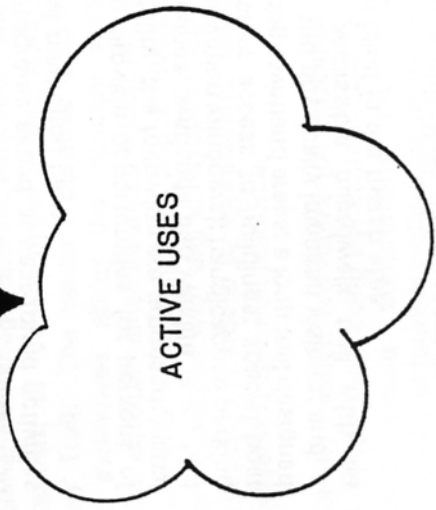
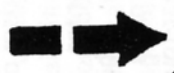
This is accomplished by designating active use areas away from dune and wetland habitats to concentrate higher impacts in less sensitive areas. Secondly, increased monitoring and regulation enforcement in environmentally sensitive areas is highly recommended. Furthermore, circulation is managed and controlled by structures and trail design. For example, a dune walkover and an overlook will be provided at strategic points along dune system; a barrier to unauthorized motor vehicles will be constructed at the Southwick Beach access point; hiking trails will be clearly marked and well maintained; and divertive, native vegetation will be planted as a physical barrier.

- 2) Use comprehensive planning and incremental development to take into account the cumulative ecological effects and the need for relatively slow growth due to limited financial resources.

Environmental impacts will be more easily controlled if additional use is generated in phases. In addition, activities which promote the center are coordinated with improved access, signage and the development of services so that increased use occurs only after monitoring and regulation devices are in place. Programming and related facilities should be developed as funding becomes available.



PEDESTRIAN CIRCULATION



- 3) Goals and objectives for the center meet the approval of a local planning committee.

The committee would consist of: community leaders; local conservation and environmental interest groups; tourism planners; neighboring land owners; representatives of New York State; and individuals or organizations that provide services, resources, or facilities which would support the center's activity. Incorporate committee input with current regulations regarding wetlands and natural beaches. Allow for continued committee feedback throughout the life of the project. Goals and objectives developed will stress environmental education which encourages the proper use and protection of resources. Finally a design vocabulary which fits the natural and cultural environment will be approved of by the committee before implementation.

Such a committee has been established from both the private and public sectors. It has functioned throughout the context of this study, and should continue through future stages. Members of the planning committee include Seaway Trail Inc., the Department of State - Division of Coastal Resources and Waterfront Revitalization, St. Lawrence - Eastern Ontario Commission, the Department of Environmental Conservation, the Office of Parks, Recreation and Historic Preservation, The Nature Conservancy, N.Y.S. Sea Grant Extension, State University College of Environmental Science and Forestry, The Ontario Dune Coalition, and community leaders from Jefferson and Oswego counties.

### GENERAL PROGRAM AND DESIGN FEATURES

The interpretive facilities should be located within sight and walking distance to high quality dune and wetland systems. It should be developed on public land in an area which concentrates a variety of intact environmental systems. The center should take advantage of existing public services and visitors of established attractions.

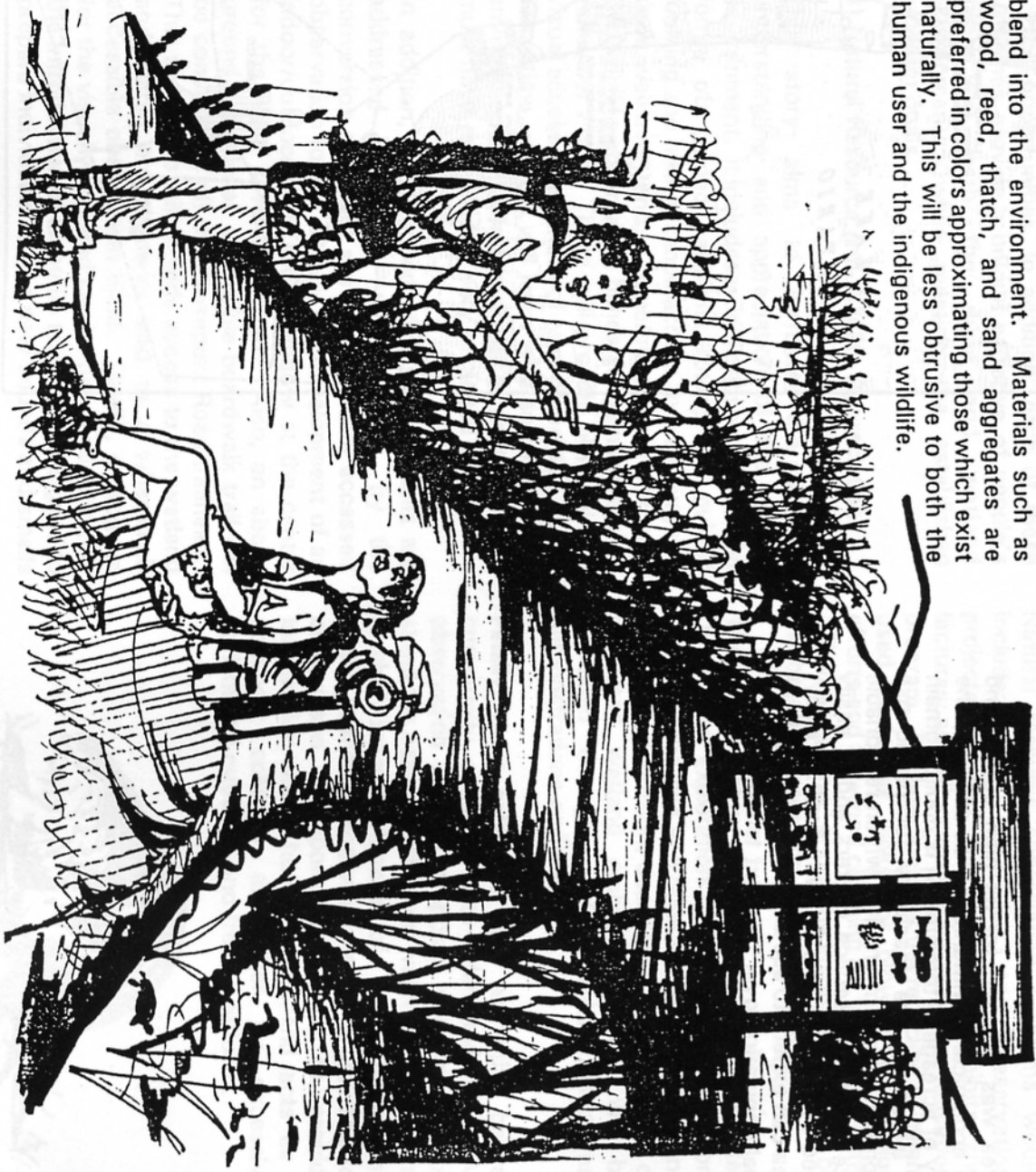
It is imperative that the development of services and marketing activities are carefully planned so that environmental impacts are managed as additional use is generated. A three phase plan of development is suggested in order to accomplish this and meet stated goals and objectives. Impacts to this environment will be mitigated through circulation design, restoration projects, and enhanced enforcement of existing regulations for public land use.

Design features should include the development of: a beach grass nursery; an evergreen nursery; barriers to exclude unauthorized motor vehicles on the beaches and dunes; wildlife observation blinds with carefully controlled or limited access (e.g., these may be closed during nesting seasons or placed in an out of the way location); a dune/marsh overlook structure; designated special use areas away from ecologically sensitive habitats; an above ground boardwalk through a section of the marsh; a working farm; a main interpretive center; and interpretive kiosks consistent with the style of those currently existing along the Seaway Trail.

Pedestrian circulation should be managed by developing proper hiking trails. The need for protection and management of the dune and wetland systems and appropriate recreational

behavior in coastal environments are featured in all structures, interpretive exhibits and educational programs.

Finally it is visually important that all elements are constructed from materials which naturally fit or blend into the environment. Materials such as wood, reed, thatch, and sand aggregates are preferred in colors approximating those which exist naturally. This will be less obtrusive to both the human user and the indigenous wildlife.



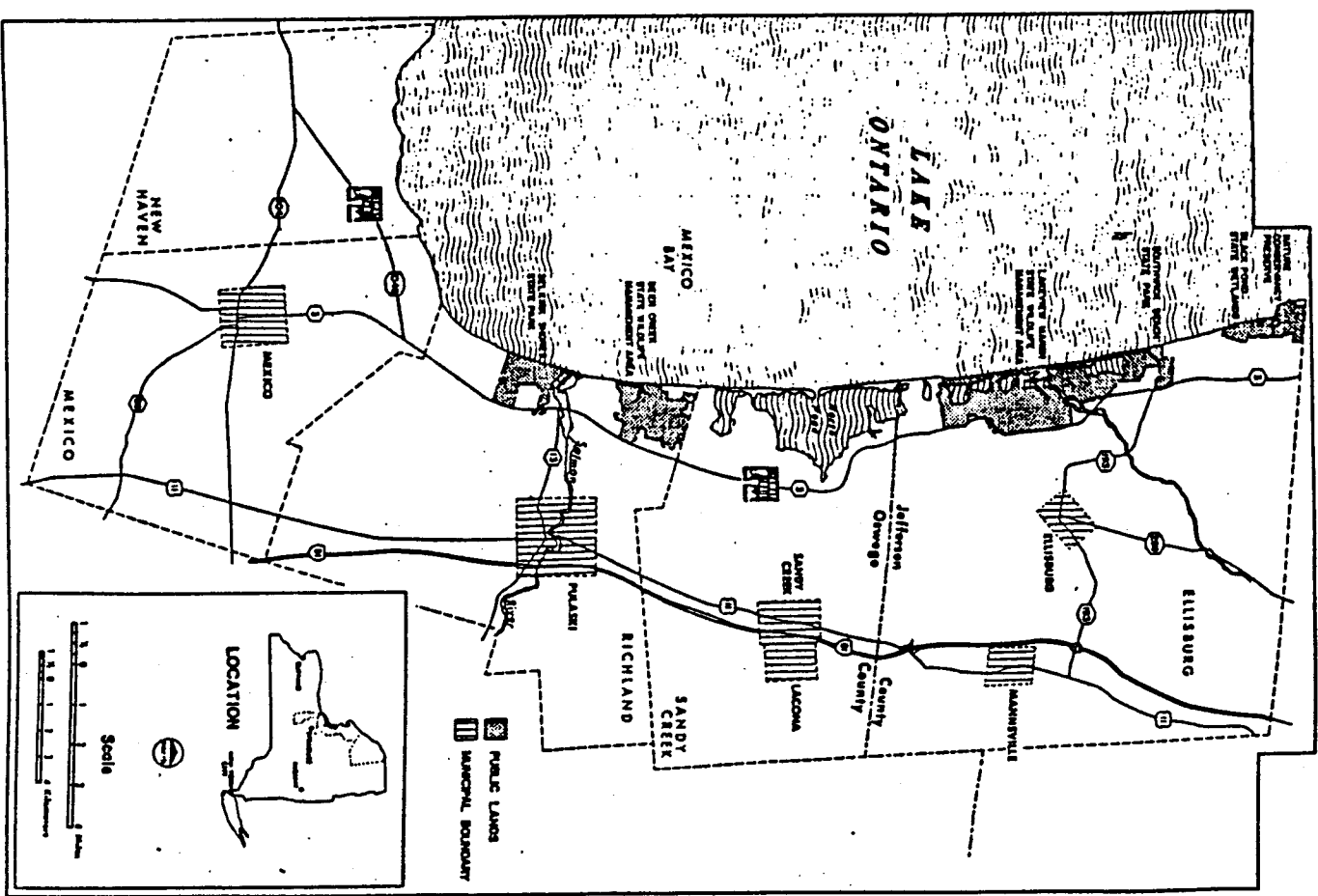


# SITE ANALYSIS

## STUDY AREA

The study area focused on a stretch of natural beaches, dunes and wetlands; extending from Black Pond State Wetlands in the north to Deer Creek State Wildlife Management Area in the south.

This area was selected for its high quality and diverse ecological communities. In addition, the majority of acreage in this stretch is public domain - thus increasing the feasibility for public use development. Furthermore, it is within reasonable distance to several service centers and is easily accessed by Route 3 (the Seaway Trail). Finally, this area can expect to see a higher residential and seasonal population over the next ten years.



# CONCEPT PLAN

## ORYLINE

e concept plan and storyline developed was dependent on both the detailed site analysis and sign issues related to scale of services, lectures, programming and exhibit space. Opportunities for cultural interpretation and naturally occurring, on-site education, were also identified. By examining these issues and opportunities, a storyline was defined which supports the interpretive and educational activities of four "sub-stories". They are: Natural Resource and Wildlife Appreciation, Outdoor Recreation, Early Technologies and Cultural Interpretation, and The Working Farm. The common thread between these four sub-stories is a concept statement, which examines human interaction with the dune and wetland environment over time.

## EXHIBITS AND PROGRAMMING OPPORTUNITIES

The four sub-stories provide a framework for educational activity related to specific site and exhibit opportunities. In addition, each of these storylines provide a unique narrative of people's interaction with the dune and wetland environments, while meeting the established program goals.

### 1) Natural Resource and Wildlife Appreciation

This story aims to increase the visitor's understanding and appreciation of the natural environment. It includes wildlife observation in the forms of: guided naturalist tours; self guided walking and hiking; canoe access to waterways; a dune walkover; and, a dune/marsh overlook; and two wildlife observation blinds at the north end of Lakeview Pond. These will provide physical and visual access to a variety of environments. At the same time, visitors will learn why some sensitive environments, like fragile dunes or nesting areas, must have restricted or very managed access.

In addition, handicapped accessibility issues are addressed in several ways. First, by the conversion of a grain silo to an elevator accessed observation tower, and by the development of an indoor/outdoor bird feeder window at the center for the most severely limited. Also, an above ground, wheelchair accessible boardwalk trail will be constructed off the Pierrepont Road trailhead. This short loop will provide access to the wetland and marsh environments and to a wheelchair accessible observation blind. Finally, a program for the visually impaired can be developed through the introduction of an audio tape tour, designed to prepare individuals for the new sounds and smells

which will be encountered on an all-senses loop trail off of Southwick Road. This trail should be paved so that it is accessible to wheelchairs.

Natural resource appreciation programs would include: dune restoration and preservation projects; air and water pollution exhibits and lectures; as well as an ongoing recycling education program. The later includes the recycling of clean, used Christmas trees for blowout restoration efforts and for wood chipping for trail beds. Litter "Clean - Up Days" should be instituted to focus on the beaches, trails and active use areas.

The natural history of the area can be interpreted through an exploration of the geological history related to the lake and dune formation. Wave and wind action, erosion, deposition, and formation of protected wetland embayment areas will be explained through outdoor signage, lectures, demonstrations and exhibits.

Finally, there exists on site, an active beaver community, complete with a dam and lodge. An observation area is proposed with information about the beaver's effect on water flow and water levels. Also an explanation of a human-made dam, aimed at maintaining water level, is provided for comparison. Opportunities exist to provide information about how this wetland acts as a sediment collector and filter for excessive agricultural nutrients and treated effluent.



# SITE ANALYSIS

## PROCESS TO DETERMINE SITE SUITABILITY

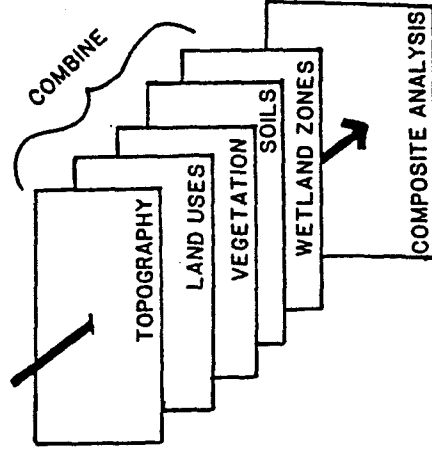
In order to select an appropriate site for the center, a physical suitability analysis was conducted. This included the use of composite overlays to determine potential locations. In order to reduce the number of possibilities, the following physical characteristics were reviewed: topography, vegetation, soils, present and surrounding land uses, delineated wetlands and related buffer zones. The results of the analysis identified five physically suitable areas: Black Pond State Wetland Area, Southwick Beach State Park (including the recently acquired Farman property), Lakeview Wildlife Management Area at Lakeview Pond, Montario Point observation area and boat access point, and Deer Creek Marsh Wildlife Management Area at Rainbow Shores.

These potential sites were evaluated in matrix form against a list of important developmental criteria. This matrix shows each of the sites compared to the following criteria: compatible surrounding land use; existing road access; soil suitable for structures; ecosystem integrity; visual and physical access to lake, beach, dunes, and marshes. Based on the results of the applied matrix and planning committee feedback, a combination of Southwick Beach State Park and Lakeview Wildlife Management Area was determined to have the highest potential for the successful development of a Dune and Wetland Environmental Interpretive Center.

Once this area was chosen, the pertinent layers of physical characteristics were reviewed, in order to make ecologically and economically sound recommendations regarding specific site

development. In addition, a user survey was distributed in May 1991, to members of the Ontario Dune Coalition, and other community

participants in order to solicit their suggestions and preferences regarding the scale and development of such a facility at this site.



## POTENTIAL FOR DEVELOPMENT OF A DUNE & WETLAND, ENVIRONMENTAL EDUCATION CENTER

	BLACK POND S.W.A.	SOUTHWICK BEACH S.P.	LAKEVIEW W.M.A.	MONTARIO POINT	DEER CREEK MARSH W.M.A.
ECOSYSTEM INTEGRITY	■	●	■	■	●
EXISTING ROAD ACCESS	○	■	●	■	●
COMPATIBLE LAND USE	●	■	■	○	○
SOIL SUITABILITY	○	■	●	■	■
PHYSICAL ACCESS	○	■	■	●	○
VISUAL ACCESS	○	●	■	■	●

HIGH ■  
 MODERATE ●  
 LOW ○

2) Outdoor Recreation

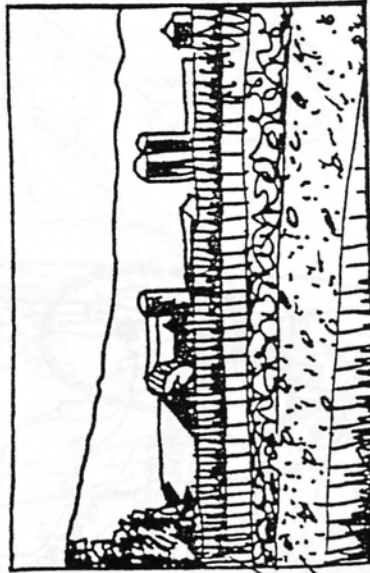
The impacts of active, unregulated recreation (e.g., high powered boating, r.v. camping, noise pollution, littering and destruction of dunes through the use of all terrain vehicles) shall be examined in this story. Guided canoe tours would be provided by a naturalist through the marsh and stream environments. During these tours, appropriate recreational behavior is stressed. This would include the no-landing policy for the marsh and dune shoreline as well as an explanation of the negative impacts that motorcraft have on fish and wildlife. Opportunities exist for lessons and



involvement in the following year-round activities: canoeing, snowshoeing, cross country skiing, ice skating, fly tying and casting, wildlife photography, ice fishing, bird calls and hiking. Hunting and trapping are also allowed in designated areas of Lakeview Wildlife Management Areas.

3) The Working Farm

The living farm concept includes demonstrations and participation on topics such as; non-point source pollution, composting, organic farming and dairy farming. While this story aims to educate



those unfamiliar with everyday farm life, it will also serve as an important educational resource for residents of the area actively engaged in agricultural or dairy farming. The Working Farm program creates a potential for income with events such as a farmer's market, and beachgrass and evergreen nurseries.

The purpose of a beachgrass nursery is to supply grass plugs for restoration projects aimed at restoring dune integrity at critical "blow out" channels. Volunteer participation and dune intern support is encouraged for restoration efforts on site, while other shoreline residents may wish to exchange work time or purchase plugs from this "farm" for stabilizing dunes on private property.

4) Early Technologies and Cultural Interpretation

This story is a cultural portrayal of how humans and technology have interacted with these delicate ecosystems over time. Topics include : Native American use of streams, wetlands and edge communities for gathering, fishing, hunting and trapping; primitive camping methods (by special permit only); early navigational techniques; ice cutting methods; log cabin, tepee and stonewall construction methods; and early technologies and impacts associated with farming in a wetland environment. Special use areas should be designated for each of these activities. Visitors will experience "hands-on" involvement with the environment through programs like "Wild Food Foraging", "Build Your Own Tepee", "Primitive Camping Weekend" and "Ice Castle Building". Many of these programs should be targeted for children, however some, like fly tying, casting and stonewall construction will also appeal to adults.

# CONCEPT PLAN

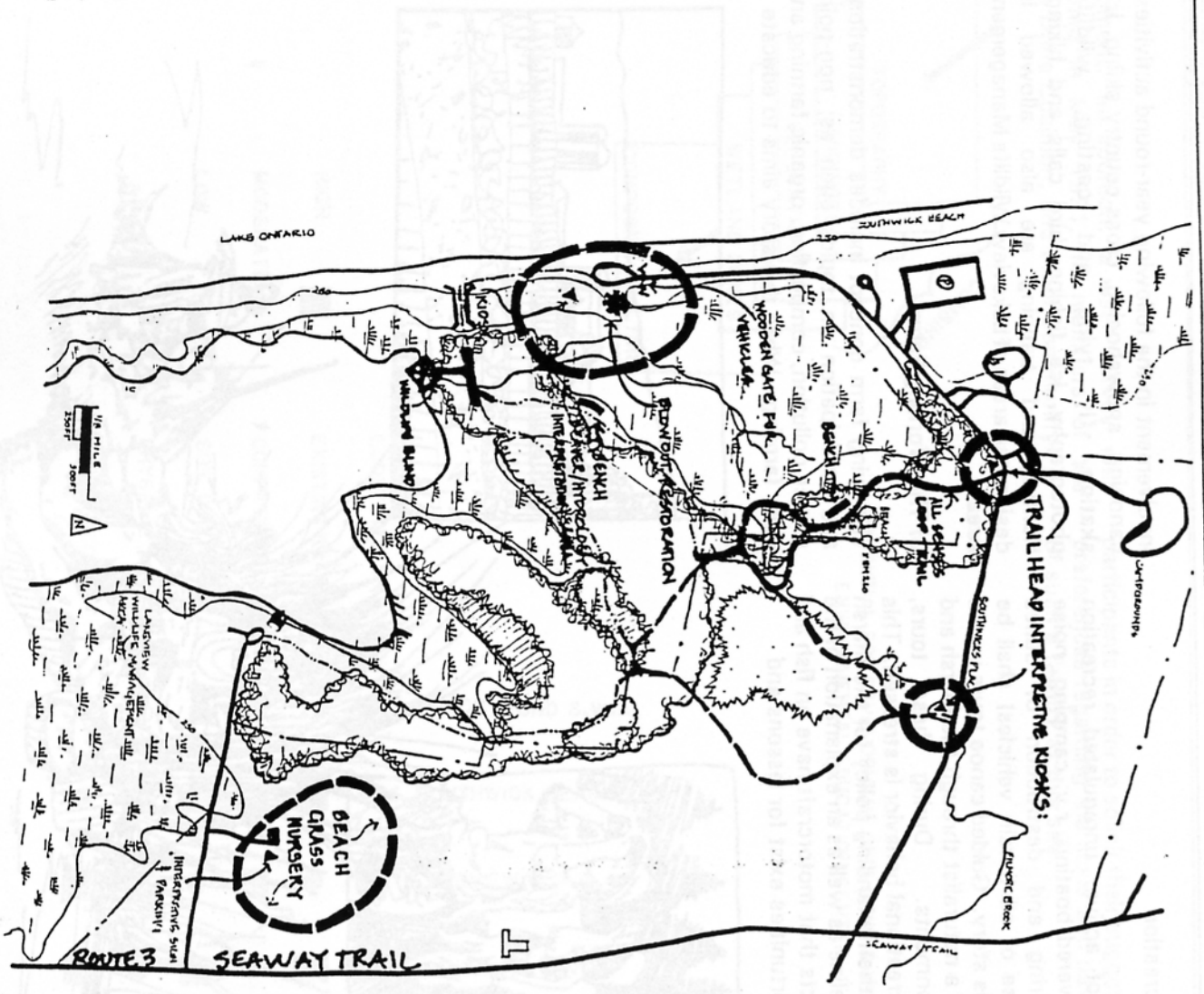
## PHASING PLAN

With ongoing input from the local planning committee, and considering the results of the site analysis, desired program, and story line concept a three phase implementation plan is recommended. The plan strives for the successful co-existence of educational tourism within an ecologically sensitive environment. The public is offered safe and managed access while developing their appreciation for these resources. Ideally, this increased awareness will encourage protection and avoid further degradation of the environment. These phases concur with established parameters defined by the goals, objectives and development guidelines for the center.

### A) PHASE ONE

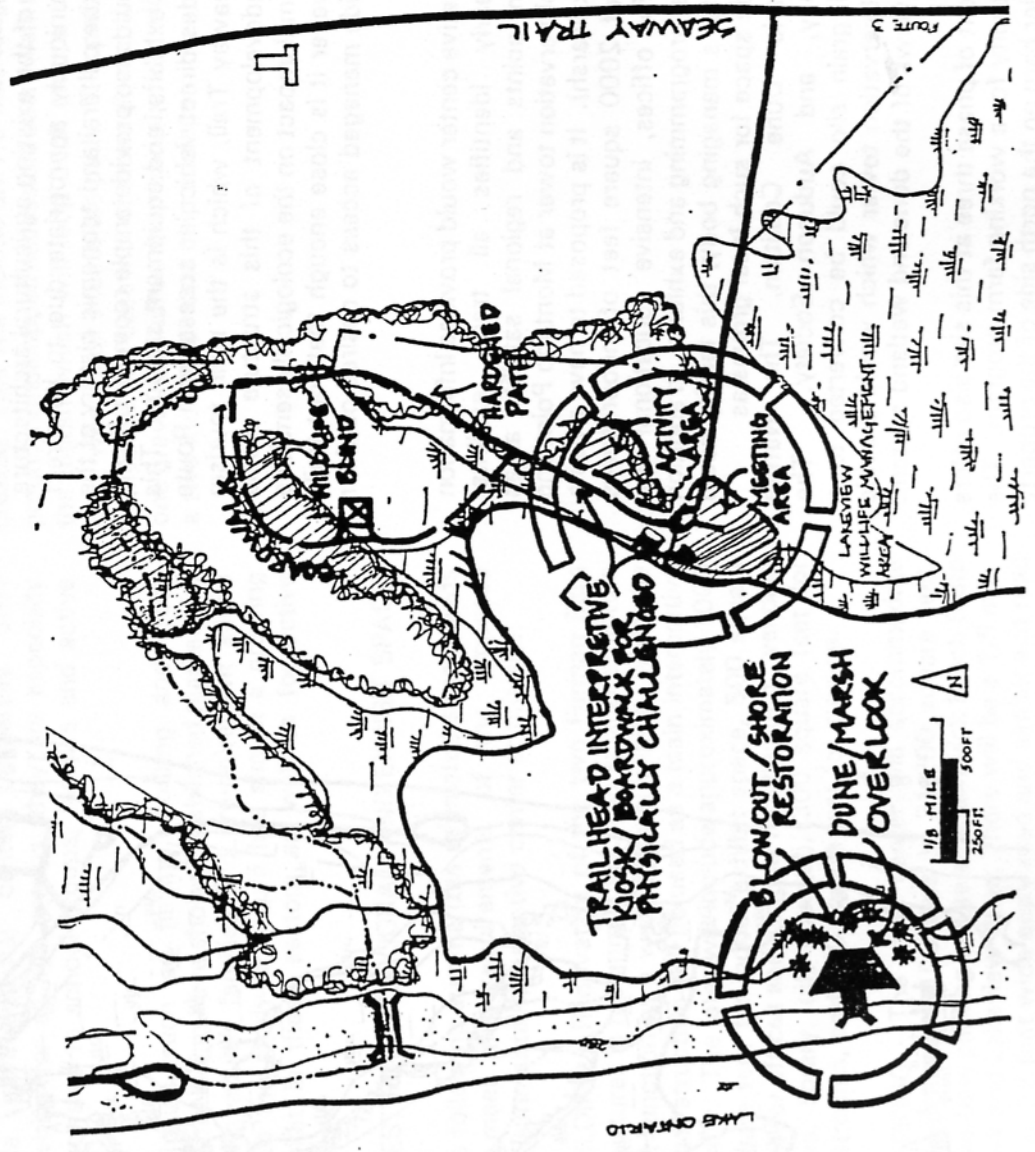
The first phase includes: development of a beachgrass nursery; upgrading and expansion of existing trail system; construction of a wooden gate to prevent unauthorized vehicles on the beach; construction of two low impact wildlife blinds in the marsh on the north end of Lakeview Pond; and construction of three informational kiosks/interpretive panels.

Kiosks serve to educate the public about the areas they are entering, ongoing programs and proper use of the resources. They will be consistent, in style, to existing kiosks along the Seaway Trail. The first kiosk will be sited at the restoration project adjacent to the Southwick Beach campsites, and the other two at the trail heads along Southwick Road. The kiosk on the beach will provide information about dune restoration and the nearby beachgrass nursery. The two kiosks on Southwick Road will clearly illustrate all trails, schedule of ongoing programs and rules for public use. One of these kiosks should be located at the trailhead to the all-senses, handicapped-accessible, loop trail and provide information about this trail in braille and print.



is a critically sensitive area, an ornithologist, a wildlife and field biologist should be consulted to site the trail and wildlife blind. Lastly, it is recommended that regulations be adopted to limit access to non-motorized crafts. A sign at the inlet to Lakeview Pond is encouraged to state this restriction.

Secondly, on the east side of Lakeview Pond, at the end of Pierpont Road a special use area is proposed. Close to the kiosk, visitors can meet for guided naturalist tours or outdoor lectures and demonstrations. In addition, not far from this area, an above ground boardwalk trail is proposed to provide wheelchair access to the marsh environment and an observation blind. Since this



B) PHASE TWO

The second phase occurs in two different areas of Lakeview Wildlife Management Area. The first area is on the high dune which separates Lakeview Pond from Lake Ontario. Here a dune/marsh observation overlook would be built. This structure would manage the current pedestrian impact from the beach and prevent further degradation of the dune while allowing visitors a prime view of the marsh. The overlook should be low in profile and blend with the natural landscape. It should incorporate signage which stresses the fragility of dune vegetation.

Boat and pedestrian access to the dunes on the west side of the pond should be prohibited and discouraged by the addition of divertive, native plant species, such as poison ivy and blackberry, to cover the currently used boat landing areas. The adjacent dune "blowout channels", currently used as trails, should be filled in with clean, recycled Christmas trees and a double row of snow fencing. These will act as sand traps and will be the first stage of restoration. Finally, beachgrass plugs will be planted as the next step in the redevelopment of the dune.

An informational kiosk is proposed for the eastern shore of Lakeview Pond, at the boat launch site, and clearly state that any crafts on Lakeview Pond are not allowed to land in the marsh or shoreline area. Boaters should be directed to land vessels on the sandy spits at the inlet of Sandy Creek and South Sandy, one and a half miles south of this area. Information on this kiosk should also include the rationale behind this rule by explaining the nesting habits of native bird species in this marsh, the special concern status of the Black Tern and the impact that boat landing and walking has on a marsh and dune shoreline.

# CONCEPT PLAN

## C) PHASE THREE

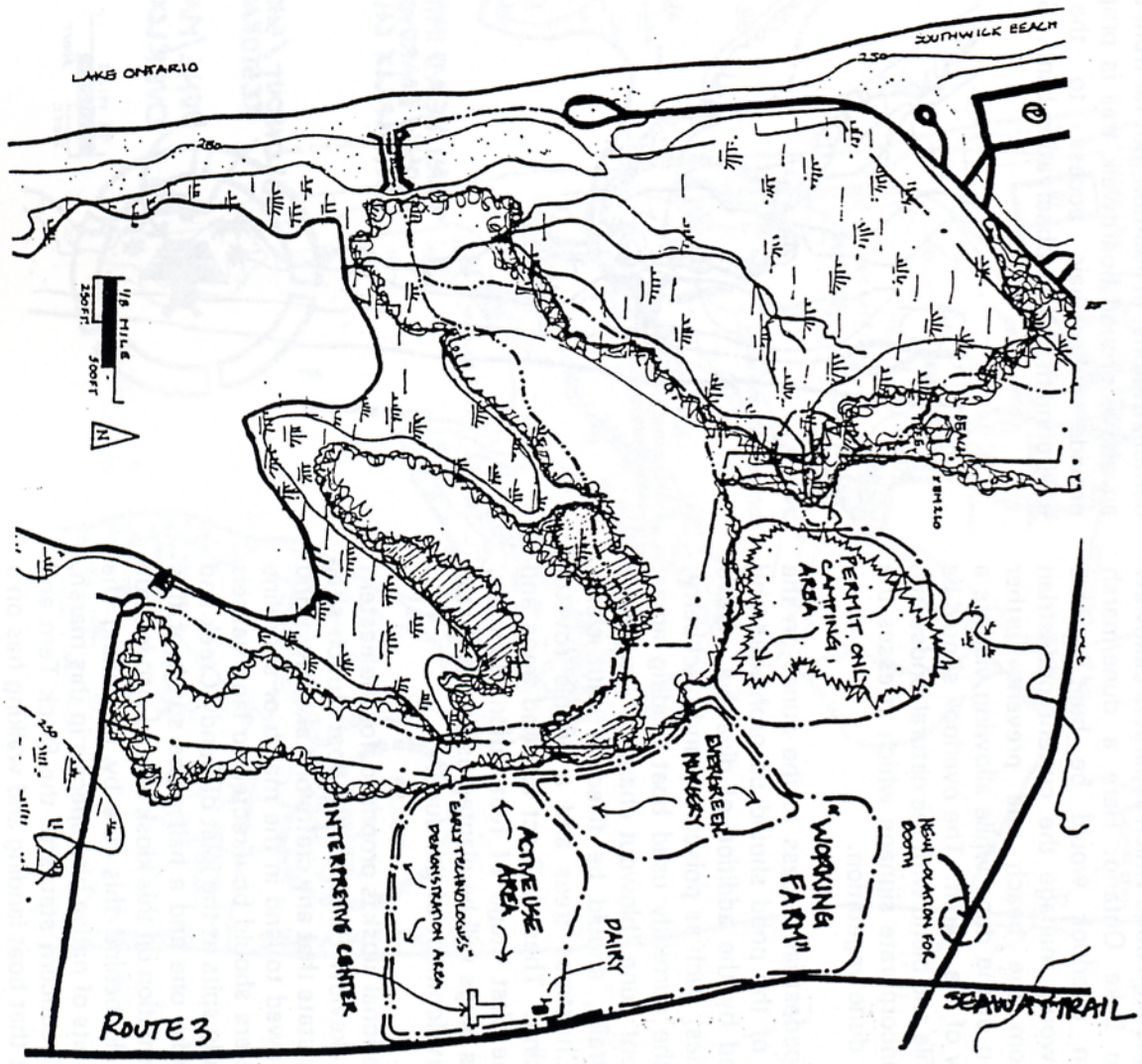
This phase encourages the renovation of the southernmost Farman Dairy Structure on Route 3, into a large scale, Dune and Wetland Environmental Interpretive Center for the region. This structure and associated property was acquired by the state of New York in December 1990. Use of the existing agricultural architecture would be uniquely appropriate due to its direct relation to the cultural and economic history of the area. It would also provide ample room for offices, restrooms, exhibits, and equipment storage. This farm provides direct vehicular access from Route 3 - The Seaway Trail, which is the main tourism route. Redevelopment of this structure would create minimal impact on the ecologically sensitive areas, however it is close enough that foot trails could provide managed access to desired outdoor areas.

The interpretive center would provide information which clearly identifies all trails, exhibits, observation points and regional satellite areas (e.g., the observation tower at Montario Point and Deer Creek Marsh). It is proposed to have a minimum of 2000 square feet of indoor space available for offices, intensive educational and recreational programming and exhibits. In addition to the center's managing body, this facility could also provide space for such local groups as The Ontario Dune Coalition, The Nature Conservancy, and Audubon Society. The associated grain silo could be converted to a elevator observation tower which would provide extensive views of the dune and wetland system.

Development of phase three at this site also offers the opportunity for a working farm program. The smaller older barn on the north side of the property

could continue to function as a dairy operation. This creates programming options for agricultural education. Other recommendations include the designation of special use areas for permit-only

primitive camping; and for early construction technologies. The later includes demonstration and activity space for hedgerow, stonewall, tepee, and log cabin construction techniques.



## FEASIBILITY

### A) ESTIMATED DEMAND

Based on a review of existing marketing and tourism studies, and demographic, social and travel trends, it is estimated that a demand exists for a Dune and Wetland Environmental Education and Interpretive Center in this area.

A survey compiled for this study indicated that during the year 1990, similar centers experienced annual visitation ranging from 72,741 to 350,000.

People are choosing to spend more of their leisure time involved in cultural, educational and family activities - especially those which offer hands-on experiences. In addition, less money will be available for extended travel in the future, so day or overnight trips are more likely to be desired. More older people are participating in recreation and fitness activities than they did 20 years ago and this group of Americans is growing substantially. Forecasters have predicted a swing from the materialism of the 1980's to an increased social consciousness in the 1990's. The state of the environment is likely to be one of the primary concerns that emerges from this trend. Activities such as bird watching, wildlife observation and hiking are expected to increase to the year 2000.

### B) ESTIMATED TARGET MARKETS

A review of the 1990 Oswego Eastern Shore Communities Survey has indicated that day use in the Eastern Shores - Sandy Ponds area is especially high and that the majority of visitors to that area spend at least one night. Currently, one third of the visitors to this area are from Syracuse, one third form other parts of New York State (many from the I-81 and I-90 corridors), and the

remaining third from other locations such as Pennsylvania and Canada.

The majority of visitors to this area are adults with small children (47%), with the second largest group being senior citizens (40%). A survey of camping populations indicated an even higher percentage (63%) to be families. Furthermore, while environmental centers generally offer activities for all age groups, they are especially responsive to school groups, families and active seniors.

Activities such as fishing, boating and cross country skiing have shown established markets for young adults, families and pre-retirement adults while the study of nature has shown a growing market in these sectors as well as for active seniors.

### C) ESTIMATED PROGRAM AND EXHIBIT SPACE

The following summarizes estimated space needs to meet the requirements of the proposed Environmental Interpretive center at this site.

**BUILDING** - Renovation of the two Farman Barn structures is recommended. The smaller structure will function as a working farm exhibit, while the larger structure will be used as a main interpretive center. The later will include approximately 1000 square feet for indoor exhibit space, 500 square feet for offices and support facilities (e.g., vending area, library, gift counter), 300 square feet for restrooms, and 200 square feet for storage.

**PARKING** - The main center will accommodate approximately 100 cars in 31,200 square feet. Overflow parking will be at Southwick Beach State Park and Lakeview Pond. There will be a 1/8 mile long, 32 foot wide entry road and similar exit road

to the center. The small existing parking lot at Lakeview Pond will exist at current size but will be upgraded to asphalt.

**TRAILS** - Currently there exists approximately 3 miles of trails on site. These will be upgraded with clearing and the addition of wood chips and trail markers. An additional 1.5 miles of trails will be created. This will include an 1/8 mile long, above ground, handicapped accessible boardwalk through the marsh which will loop back onto a 1/4 mile long, wheelchair accessible path. This path will be composed of a base mix of stone dust and number one gravel, six inches deep and six feet wide, with a two inch hardwood chip surface.





**SUMMARY**

The creation of an environmental center which interprets dune and wetland ecology and its relation with humankind will be a valuable asset to the local communities and regional tourism efforts. Through education, increased management, and environmental programming, the importance of this resource area will become apparent. Proper use, increased protection, and restoration efforts will be supported as public awareness raised.

This study did not investigate or determine the economic or political feasibility of developing such a center. Nor did it determine the politics of the potential managing bodies or operating structure for such a center. While the author does have an opinion on these topics, this study focuses only on the physical, environmental, and programming aspects of planning and development. However, investigation into the aforementioned aspects are crucial to the success of such an endeavor and should be researched thoroughly in a further study.