# Eastham Open Space and Recreation Plan

Prepared by the Open Space Committee
for submission to the
Department of Environmental Management
Division of Conservation Services

***January 2007***

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# Eastham Open Space and Recreation Plan

## Section I: Plan Summary

Eastham's Open Space and Recreation Plan provides goals that not only strive to protect half of the town's remaining undeveloped land, but are hinged upon the protection of groundwater, surface water, and coastal resources. Being bounded on the east and west side by water while also having many interior kettle ponds, marshes, wetlands, and coastal embayments, the town of Eastham's main strategy for this plan is to provide open space for the use and enjoyment of its citizens and to simultaneously provide a healthy habitat for plants and animals. This will require more than money, but a comprehensive coordinated plan geared towards and focused upon existing resources and future, long-term needs for conservation.

The Open Space and Recreation Plan is currently being implemented to balance and focus the Town's acquisition and protection programs. This plan recommends the development of three other plans: a Groundwater Protection Plan, a Wastewater Management Plan, and a plan for growth management. These plans are presently underway and will begin to address the need for resource protection, especially with regard to water. The three major sections of the Open Space Plan include groundwater protection, wastewater management, and growth management. Groundwater, especially, is critical in a community with a single source aquifer, no Town water supply, and on-site wastewater disposal. Due to the imminent threat that on-site wastewater disposal poses to water resources, the plan also focuses on the relationship between the quality of the groundwater in regards to inland and coastal water resources.

The community of Eastham has consistently rated the natural beauty and outdoor recreation opportunities of the town as two of its most valuable assets, and therefore recorded an inventory of the natural resources within Eastham that make it such a unique environment. The citizens have demonstrated their commitment by sending a mandate to their elected officials and Town staff to make acquisition of open space a top priority. The Town has taken its stewardship role very seriously, even before the establishment of the Cape Cod Land Bank, Eastham was purchasing open space to prevent development and provide recreational opportunities. The Town continues to provide the resources and staffing essential to maintain and improve its land holdings, and this Open Space Plan recommends the criteria necessary for evaluating future land purchases.

Along with voting for the acquisition of open space parcels, Eastham citizens have dedicated thousands of hours conducting volunteer efforts like planting trees, cleaning beaches, and testing water quality in ponds and wells. While much of the planning and oversight of open space is handled by various regulatory boards, the volunteer committees make significant contributions in support of the goals laid out in this plan.

This plan outlines ten goals relating to water resources conservation, plant and animal habitat protection, and land acquisition. Each goal is supported by a series of objectives ranging from recommended changes of existing by-laws and regulations of resources to improvements of the public's assess to ponds and shoreline. Accompanying the objectives is an inventory of Town-owned beaches and a Conservation and Recreation Inventory of all Town-owned open space and recreation facilities, which also records the accessibility status of each property. In addition, the plan contains a five-year implementation program, which is a series of concrete recommendations serving as a road map for the future to be used by the Board of Selectmen, Open Space Committee, Conservation Commission and Town staff. The program provides guidance to agencies such as the Cape Cod Commission, Department of Environmental Management, and Department of Environmental Protection in order to provide technical assistance to the Town.

The publication of this plan demonstrates the long-term commitment of the Town to provide and protect open space for its plants, wildlife, citizens, visitors, and future generations. The availability of undeveloped land takes on an essential function to counterbalance the man-made environment with the natural environment. Existing within the exceptional and fragile ecosystem of Cape Cod, the Town assumes a critical responsibility for natural resources that impact the daily lives of its citizens and neighbors. Launching this plan will start process of ensuring that those natural resources are protected and used in the most sustainable way possible through a comprehensive and coordinated effort. The citizens of Eastham recognize how fortunate they are to reside in such a unique place, and they are counting on the Town, other government agencies, and their fellow Townspeople to assume a leadership and stewardship role to preserve and enhance this environment. Without such an effort, Eastham will diminish its delicate ecosystems and lose the exceptional resources contained in them.

## Section II: Introduction

### A. Statement of Purpose

By studying a US Geological Survey map of Eastham, it is visibly apparent that the town is a narrow strip of land between the Cape Cod Bay and the Atlantic Ocean, infused with kettle ponds and infiltrated by coastal embayments, marshes, and wetlands. The interaction between land and water is an intricate and vital, which is why it is not surprising that an Open Space and Recreation Plan for Eastham would be closely tied to preserving and protecting its groundwater, surface water, coastal water and other natural resources. These resources are important not only as areas where active and passive recreation is most likely to coincide, but also as the very lifeblood of the community.

### B. Planning Process and Public Participation

In 1971, work commenced on the first Open Space and Recreation Plan in conjunction with Eastham's purchase of the Wiley Park property, which contains 44 acres of upland forest along the western shore of Great Pond and could contain walking trails, fresh water swimming and animal habitat. Long before the establishment of a Land Bank, Eastham residents saw value in Town-owned open space, and with this purchase came the beginning of the establishment of a greenbelt that grew with the subsequent purchases of the Nickerson and Horton properties.

As residential development accelerated during the 1980's, Townspeople were concerned about the diminishing open space and the degradation of natural habitat for native wildlife. The Town became galvanized around the issues of overdevelopment and the resulting damage to the natural environment, and was a pressing need for a more comprehensive open space plan. One was developed over a period of ten months in 1984, in collaboration by a broad-based community committee of representatives from Conservation Commission, Board of Selectmen, Planning Board, Recreation Commission, Natural Resources Department, Council on Aging, Historical Society, Eastham Elementary School, Eastham Non-Resident Taxpayers Association, Chamber of Commerce, the National Park Service, and several unaffiliated citizens. The plan attempted to take back control of Eastham's future.

A grant of $900.00 from the Cape Cod Conservancy District was used for costs related to the compilation and printing of the plan. Two mailings of questionnaires elicited citizens' comments. The first was sent to 300 residents; the second was a mailing to 100 non-resident taxpayers. The number of respondents showed that Eastham citizens welcome the chance to have input into the planning process and agree a comprehensive plan to manage remaining open space was essential. As these ideas were developed into goals and objectives, public informational meetings were held to

update citizens with the committee's progress.

It was evident that a consistently growing population, using homes for longer periods of time each year, would put private wells in jeopardy. Thus, it became important to acquire as much land as possible, as soon as possible. Every vacant and potentially subdividable piece of land was painstakingly identified and mapped. The next step in the process was to inform and educate the voters to realize that buying land for open space would protect the water supply. The effort was a complete success; the Town voted on May 19, 1987, by a vote of 367 to 19, to purchase the Lamont Smith parcel, which is now a nature preserve with trails, a pond, and habitat for all wildlife.

The original 1985 Open Space and Recreation Plan consisted of a five-year action plan, and many of the goals envisioned in 1985 came to fruition: (1) purchase of the Lamont Smith property (mentioned above); (2) purchase of the Horton property, bordering on two ponds, for open space and passive recreation; (3) passage of the legislation establishing the Cape Cod Commission as the land use regulatory agency for Barnstable County; and (4) the position of a shared Town Planner, which was approved in cooperation with the Town of Wellfleet, was enacted.

Early in 1995, an update of the Eastham Open Space Plan was begun. A new questionnaire was distributed by the Local Comprehensive Planning Committee in conjunction with the development of a master plan. The results of that survey showed the population remained as committed to controlling growth and protecting open space. In eleven years from 1984 to 1995, more than 528 houses had been constructed in Eastham, and the impact on the natural environment and groundwater quality were evident and alarming.

An immediate concern was to prevent an approved subdivision of over 70 half-acre lots from being developed. A local sand and gravel company had used this 63-acre parcel as a “borrow” pit. The plan, which subdivided the parcel into half-acre lots, was submitted to and approved by, the Eastham Planning Board. This occurred just prior to the revision of the Zoning By-laws, which increased the minimum lot size to one acre.

In May of 1995, development seemed imminent. The land, adjacent to the Mass Audubon Society in northwest Eastham, was for sale. An all out effort was launched to save the parcel, including a voter education program utilizing updated figures from the draft Open Space and Recreation Plan. The Village Improvement Society 1995, a private group modeled on previous VIS committees, raised money to pay for two property appraisals. The statistics and maps were updated to demonstrate the negative impacts such a large development would have on the quality of life in Eastham. The VIS '95 distributed flyers and fact sheets at post offices and businesses, held a public information meeting and two separate "walkabouts" at the property. All of these events were well attended.

The effort to protect the property paid off when on February 14, 1996, a vote to exclude the purchase price of $1.2 million from the provisions of Proposition 2½ passed by a vote of 746-439. The following day, Eastham citizens voted to buy the property at a Special Town Meeting by a vote of 212 to 73. Once again, Eastham declared its commitment to growth management through acquisition, and to preserving open space and habitats.

All of Cape Cod expressed a similar commitment in 1998 with the passage of the Land Bank. A three percent "surcharge" on local property taxes was evidence that Cape Codders were willing to put their money where their commitment was. Eastham, along with other towns, was faced with the need to develop procedures and protocols for evaluating property and making the best use of the new funds. As part of that process, it was time to complete the update of the Open Space and Recreation Plan.

A number of valuable resources had also come into being during the 1990's. Eastham adopted its Local Comprehensive Plan and the Plan was certified by the Cape Cod Commission in 1996. That same year, the Commission released the Outer Cape Capacity Study, an in depth look at the four Outer Cape towns that included sections on land use, water resources and natural resources. In 1998, Eastham hired a full-time Town Planner who worked with the Open Space Committee on the revision of the plan. Also in 1998, the Cape Cod Commission released a report on Water Resources of Outer Cape Cod, which contained data on water quality and water quantity along with recommendations for protecting this vital resource.

A Community Vision Workshop was held in April of 2000, a joint effort of the Long Range Planning Advisory Board, Planning Department and Cape Cod Commission. At about the same time, the Eastham 2025 Committee distributed a Town-wide survey to over 4,000 resident and nonresident taxpayers. The Workshop and the survey confirmed that its natural resources are one of the Town's greatest assets and that preserving open space and wildlife habitat remain top priorities. In addition, providing new recreational opportunities and maintaining existing facilities for young and old alike is important to the citizens. Support for building facilities such as a community center is strong, with Townspeople recognizing the benefit of consolidating services under one roof.

Since the last update of this Plan, more progress on many of our goals has been accomplished. For Open Space, the purchase of the Aschettino property added 19 acres to existing conservation lands in the southern end of Town. The Meservey property provided an important link to our trails through our Kettle Pond systems, and the Walters property provides a resting spot along the bike trail and eliminated eight possible homes. Finally, three more important properties were approved for acquisition by vote of the Annual Town Meeting in May 2004.

Progress has been made monitoring our water supplies and our ponds, with volunteer

help. Americorps Cape Cod and Natural Resources personnel have developed a number of new trails and cleared many overgrown existing trails. Volunteers are helping to reforest Wiley Park. A revitalized bike committee has made improvements to our bike trails and has plans for more upgrades. Recreation opportunities have increased significantly. New by-laws and policies have helped to limit the "mansionization" of houses, and a framework for growth management has been developed.

The Committee wishes to acknowledge the help and support it received from Town Administrator Sheila Vanderhoef, Natural Resources Officer Henry Lind and his staff including Kay Stewart-Greeley and Keith Johnson, Town Planner Terry Whalen, the staff of the Assessor's office, Jane Crowley of the Eastham Board of Health, Recreation Director Mark Powers, the Conservation Commission, the Bikeways Committee, Steve Douglas and the staff of the Highway Department, Eastham Pond Monitor Sandy Payne, the Eastham Historical Society, Mark Robinson of the Compact of Cape Cod Conservation Trusts, and Jim Bradley and Lee Chase of the Cape Cod National Seashore. Additional source materials used in the preparation of this plan include the Town of Eastham Local Comprehensive Plan, 2nd Edition, October, 2002; Town of Eastham Annual Reports for 2002 and 2003; the Outer Cape Capacity Study; the Eastham Vision Workshop and Survey of 2000; the Regional Policy Plan of the Cape Cod Commission together with other related documents and maps; and the Cape Cod National Seashore's Archeological Report of 2004.

Respectfully submitted,

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## Section III: Community Setting

### A. Regional Context

The Town of Eastham is a coastal resort community straddling the "outer arm" of Cape Cod. Referred to by the Chamber of Commerce as the "gateway to the Cape Cod National Seashore", Eastham is bounded on the north by the Town of Wellfleet, on the south by the Town of Orleans, on the west by Cape Cod Bay and on the east by the Atlantic Ocean. It is approximately four miles wide from east to west and seven miles long from north to south with a total area of 27.26 square miles, an upland area of 13.99 square miles and 37.4 miles of tidal shoreline. The Cape Cod National Seashore occupies most of the eastern portion of the Town, with approximately one-third of the land area within the Seashore boundaries.

As one of the 15 towns in Barnstable County, Eastham lies at the beginning of what is commonly known as the Outer Cape, an area that runs up to Provincetown and that tends to be more rural, quieter, less crowded, less commercial and most like the old Cape Cod. This area is also more seasonal than the Mid and Upper Cape, with an economy based on the summer tourists and 50% of the households vacant during the winter. Like most of the communities that make up the Outer Cape, Eastham is concerned with encouraging economic development that will provide year-round employment, and at the same time not denigrate the fragile ecosystem, housing for year-round residents in a real estate market that sees a 30% annual increase in home prices and the ever increasing traffic on Route 6, the only way in and out of the area for motor vehicles.

Route 6, the main artery on the Cape, literally cuts through the heart of Eastham, dividing the Town into two parts. On a typical summer day, 30,000 vehicles pass through the Town. This not only inconveniences the residents, but many are afraid to travel on the road, having either experienced or witnessed the numerous accidents that occur each year. The Police Department has made major strides toward reducing the accident rate in recent years. Most commercial development is located along the roadway, and many citizens believe the Town should "take back" its main street by reducing the volume of traffic, reducing the speed of traffic, implementing traffic calming techniques and making the road safer and more useful for "locals."

Eastham shares its sole-source aquifer (the only source of drinking water) with the southern section of Wellfleet. Both towns draw from the Nauset lens, one of six lenses (watersheds) on the Cape. This lens also supplies seven great ponds in Eastham and South Wellfleet. Eastham is a partner, with Orleans and Brewster, in the Tri-Town Septage Treatment Facility in Orleans and has reciprocal agreements with police and fire departments in neighboring towns. Eastham is also the home of Nauset Regional High School, which it operates in partnership with Brewster, Orleans, and Wellfleet.

As one of the smaller towns on the Cape, Eastham benefits from its association with the Cape Cod Commission, a regional planning agency that provides planning and technical assistance to the Town. The Commission was instrumental in the development of a Regional Policy Plan, Outer Cape Capacity Study and Eastham's Local Comprehensive Plan, all adopted in 1996, and has provided the Town with GIS base maps and specialized planning maps. The Commission provides a valuable regional context for planning and land use issues by involving all 15 towns in decision-making and by providing technology and technical support that the individual towns could not afford.

## B. History of Eastham

Prior to the arrival of the Europeans, the "Kingdom of Nauset" covered the Outer Cape and the Islands with the major villages, inhabited by the Nausets, a band of the Wampanoags, along the shores of the present Town Cove and Nauset Marsh. Seven families (about 49 individuals) arrived from the Plymouth Colony in 1644. The directors of the colony, dissatisfied with the poor quality of lands granted them in Plymouth, sent the delegation to scout Eastham for a new site for the center of government. The decision was not to move, but the seven families stayed and established a new town. In 1646, the General Court gave permission for the community of settlers to organize as the "township" of Nauset. The Town of Eastham was established in 1651 by an order of the General Court. Included within the town boundaries at that time were Orleans, Chatham, Wellfleet, and parts of Brewster and Harwich. With the separation of Orleans in 1797, the present boundaries of Eastham were established.

As one of the oldest towns on Cape Cod and in the Commonwealth, virtually all of Eastham is eligible for listing as a historically significant landscape. The history of the Town is closely tied to the history of its land use. Unlike other towns on the Cape with distinctive 19$^{th}$ century village development patterns, Eastham developed as farms with little evidence remaining of an historic village center. Historically designated structures and sites are scattered throughout the Town, because its past is rooted in agriculture. When the first settlers arrived, the area was covered with dense forests, of which little remains today because the trees were cut for building, farming, sheep grazing and fuel, or within the last century, much of the land was clear cut for residential development. When Henry David Thoreau walked through Eastham in the mid-1800s, there was not a tree to be seen from horizon to horizon. He named the area the "howling plains of Nauset." This barren scene lasted until the 1950s.

Long after most Cape towns had abandoned farming, the well-drained sandy soil of the Eastham Plains supported a thriving truck garden industry. Well into this century, Eastham was famous for its strawberries, asparagus and turnips. Even today, one occasionally comes upon "wild" asparagus still growing in abandoned fields. Because much of Eastham remained in agriculture until recently, the process of forest succession got off to a later start here. The upland forests of Cape Cod display a checkerboard

pattern of plant types, which have emerged from a previously barren and impoverished landscape, due to past European land use practices. Native Americans cultivated the land by clearing small plots for mixed crops and by burning. The soil remained enriched. Pilgrim settlers and those that followed were not aware of the impact they would have on the land until it was too late.

The most recent changes to the landscape have come from the stampede of residential development in the 1980s and 1990s. While new subdivisions are rare, the development has continued as infill on already divided parcels and on parcels previously considered undesirable because of their difficult topography or proximity to Route 6. The result is that the Town has begun to lose its rural characteristics and has become increasingly suburban. New homes usually include large ceremonial lawns and non-indigenous plants and landscaping that require large amounts of water to survive. In addition to these large "trophy" houses, a number of seasonal cottages and bungalows are being enlarged and improved as owners convert to year-round use. Much of this "mansionization" is occurring on quarter and half-acre lots that are grandfathered under current zoning.

## C. Population Characteristics

Eastham's largest population prior to World War II was 966 persons in 1830. From that time it declined steadily until there were only 430 citizens in the Town in 1920. The net rate of decrease was close to 3% per year; with a large proportion of those who left being youths seeking employment opportunities elsewhere. After the First World War, population increased slightly and by the end of World War II was about 600.

In the post-war period, three factors had a dramatic impact on Cape Cod and Eastham. Rapid expansion of the nation's road system and automobile ownership put Cape Cod within one day's drive for more than 80 million people in the Boston metropolitan area and up and down the coast. In 1961 the National Seashore was established and quickly attracted many visitors, now averaging over five million per year. Many retirees were attracted to the Cape, and the year-round, retired population contribution to the Cape's and Eastham's economy now exceeds that of tourism. At the 2000 census, Eastham's population stood at 5,453 and the seasonal population was conservatively estimated at 22,000.

The summer population consists of four groups: the year-round residents, the second home owners who reside only during the summer, the tourists and visitors in non-dwelling accommodations (motels, campgrounds, and cottages) and the day trippers, visitors that come, but do not stay overnight. The 1980 summer population was estimated at 18,292, raising the off-season density of 244 to 1,284 persons per square mile. The 2000 summer population was estimated at 22,000, raising the off-season density of 383 to 1,983. Of the 1980 summer population of 18,292, 70%, or 12,845 persons, were second homeowners. Of the summer population of 2000, 50%, or 11,000

persons are second homeowners.

Eastham has experienced tremendous residential growth in the past twenty years with 2,085 permits issued for new homes, an average of 104 new houses each year. As stated before, in 1980, Eastham had an off-season density of 244 persons per square mile. That number increased to 319 persons per square mile in 1990 and to 383 persons per square mile in 2000. In 1969, 48.2% of the Town was undeveloped, decreasing to 16.5% in 1991 and to 7.4% in 2002 according to information furnished by the Town Assessor. Between 1980 and 1990, the Town's population grew from 3,472 to 4,462, a 28.5% increase, and to 5,453 in 2000, an 18.2% increase. Historic changes in Eastham's population are listed in the Table 1 below.

## Table 1

## Population Change

| Year | Population | Change | % Change |
|---|---|---|---|
| 1900 | 502 | | |
| 1910 | 518 | + 16 | + 3.2% |
| 1920 | 430 | - 88 | - 16.9% |
| 1930 | 543 | + 113 | + 26.3% |
| 1940 | 582 | + 39 | + 7.2% |
| 1950 | 860 | + 278 | + 47.8% |
| 1960 | 1,200 | + 340 | + 39.5% |
| 1970 | 2,043 | + 843 | + 70.3% |
| 1980 | 3,472 | + 429 | + 20.9% |
| 1985 | 4,043 | + 571 | + 16.4% |
| 1990 | 4,462 | + 419 | + 10.3% |
| 2000 | 5,453 | +991 | +18.2% |

Source: U.S. Census Bureau, compiled by the Cape Cod Commission

Buildout is forecast for some time between 2006 and 2015. "Buildout" is defined as the maximum permissible construction of houses and businesses under current regulations. A buildout analysis looks specifically at zoning, not at market conditions; thus, it is a measure of development potential, and not demand. At 100% buildout, demand for water would triple, the school population would triple, the number of residential units would triple and traffic would more than triple. The additional nitrate loading from the septage disposal systems and the additional loss of green space are certain to impact the Town's natural resources and wildlife habitat.

Data compiled by the Department of Housing and Community Development provides a closer look at the year-round population and shows an almost equal division between those younger and older than 45, and an almost equal number of males and females. The birth rate is below the state average and the death rate is slightly higher. In general, the population tends to be older, with the many retirees changing from seasonal to year-round residency. Less than 2% of the population is non-Caucasian. Traditional married couple households comprise 58% of the total, with 29.6% being non-family households.

The median household income is $31,339, roughly 84.8% of the state average. Per capita income is $16,004 or 92.9% of the state average. A total of 8.6% of the residents fall below the poverty line, compared with 8.9% statewide. The year-round unemployment rate is only slightly higher than the sate average. This is noteworthy when compared to other Outer Cape towns that have winter rates of nearly 50% unemployed. The largest sector of the workforce is employed in wholesale and retail businesses, followed by the construction trade and then retail services such as finance, insurance and real estate. Businesses tend to be smaller, with the largest employers being the Sheraton Four Points Hotel and the Town of Eastham.

**Table 2**
**Age Composition**

| Age Groups | 1970 | 1980 | 1990 | 2000 | % Change: 1980-2000 |
|---|---|---|---|---|---|
| 0-4 years | 128 | 178 | 255 | 208 | 16.9% |
| 5-19 years | 499 | 683 | 733 | 846 | 23.9% |
| 20-59 years | 839 | 1,686 | 2,074 | 2,658 | 57.7% |
| 60-74 years | 444 | 689 | 1,046 | 1,112 | 61.4% |
| 75+ years | 133 | 236 | 354 | 629 | 167.2% |

Source: U.S. Census of population, 1970, 1980, 1990, 2000
U.S. Census Bureau, compiled by Cape Cod Commission

## D. Growth and Development Patterns

### *Land Use Patterns and Trends*

Historic development patterns and trends were closely tied to farming and agriculture. The "First Comers" from Plymouth were attracted to Eastham by the rich topsoil and heavily wooded, level terrain. They removed the trees and put the fields into wheat, corn and other crops, which flourished, in the one- to two-foot layer of humus that had been accumulating since the last glacier receded 10,000 years before. With the tree cover and other indigenous vegetation removed, rain and high winds swept across the plains depleting the rich soil by the 1770's. When he made his walking trip across the Cape in 1850, Thoreau described the land as "white and yellow, like a mixture of salt and Indian meal, a substance which gives soil a poor name."

The impact on the Town's economy was devastating. The recovery of salt from ocean water in wooden salt works provided a revenue source for a few years, but that market faded when salt mines were opened in upstate New York in the early 1800's. After Orleans separated in 1797, Eastham was left with no natural harbors on either coast. Men went to sea from other ports; the remainder of the population was reduced to subsistence farming and/or shellfishing. The introduction of cranberry bogs in the late 1800's and later the cultivation of turnips and asparagus helped, but life in Eastham from 1800 until after the First World War was one of marginal economic existence. Settlement patterns tended to be individual houses situated far apart on farms rather than the tight village development pattern in other Outer Cape towns, usually centered around a deep-water harbor. Even today, the Town has no clearly defined center. It consists of at least three different centers: around the historic Windmill green and Town Hall, the Historic District across from the Salt Pond Visitors Center and the commercial center at Brackett Road and Route 6.

Today, Eastham is dominated by four major land use sectors: residential use along the Cape Cod Bay and either side of Route 6; Route 6 which bisects the Town with commercial development and limited industrial uses; and the Cape Cod National Seashore. The most dramatic change in land use over the last twenty-five years is in the amount of developed land versus undeveloped land. The amount of land devoted to residential development has increased nine-fold, from 340 acres or 3.7 percent of the Town in the late 1960s to over 3,000 acres or 33 percent of the Town today. Understandably the amount of undeveloped land has decreased at a comparable rate from 4,400 acres or 48.2 percent of the Town in the late 1960s to around 1,200 acres or 7.4 percent of the Town today.

This intensity of development and the related pressure placed on the Town have been dramatic. In addition, neighboring towns have also experienced similar development, which has affected daily life in Eastham. Added tourism, especially related to the Cape Cod National Seashore, an increase in commercial development in Orleans, and more activities scheduled during the fall and spring shoulder seasons have also contributed to an increase in both through and local traffic, especially along the Route 6 corridor.

Residential structures in Town are fairly uniform in architectural scale and style. Most single-family homes were built during the last forty years and can generally be described as either single-story ranches or two-story Capes. Residential areas in Town are no longer only concentrated along the coastline and near commercial centers but have spread inland. The homes were all built without town water or sewer services, with the newer ones built on lots of one acre or more and the older ones on quarter and half acres.

Non-residential uses are predominantly commercial and situated along Route 6. They are principally restaurants, inns or motels, professional offices, public facilities,

nurseries, gas service stations and storage facilities. These uses comprise only one hundred and thirty-five (135) acres, primarily located along Route 6 with corresponding level of service and safety impacts. Many of the commercial developments are designed in the roadside "strip" single story building style with no consistent appearance. Some have purposely retained a residential scale and style appropriate to the Town. There is an industrial district located off Brackett Road and a small district for marina-related uses to accommodate residential boating and fishing needs located in the southern-most point in Eastham along the Bay near Rock Harbor.

The Cape Cod National Seashore, authorized by Congress in 1961, comprises one-third of Eastham (4,800 acres), including most of its six and one-half mile Atlantic shoreline, from Orleans to Wellfleet. Town Cove and the outer Nauset Beach are not part of the Seashore. More than one hundred privately owned residential dwellings exist within the Seashore, most of which were constructed prior to the Seashore's creation.

Eastham is fortunate to have its natural setting between Cape Cod Bay and the Atlantic Ocean and a third of its total land area preserved as open space within the Cape Cod National Seashore. In addition, the Town, along with private citizens, has set aside many parcels of land that include municipal, conservation, recreation and historical sites. These include saltwater and freshwater beaches, landings and ponds, trails, marshes, meadows and playing fields.

***Transportation***

Eastham is primarily a residential community with 33% of the current developed land devoted to residential uses. The largest landowner in the Town is the Federal Government with the Cape Cod National Seashore. In addition, nearly 50% of the homes are used seasonally. Eastham's existing transportation system consists of roads, limited bus service and bicycle/pedestrian travel. Eastham residents, like those in most other Cape communities, rely primarily on the automobile for transportation. The Cape Cod Rail Trail, a regional bicycle path traverses the length of Eastham. A sidewalk runs along the west side of Route 6 in Eastham. Because the walkway is immediately adjacent to the curb, and because the traffic on the road travels at high speed, the sidewalk is rarely used. In addition, there are recreational bicycle paths and walking trails within the Cape Cod National Seashore.

Eastham's existing transportation system consists mainly of roads, as opposed to other means of transportation. Today, approximately 95% of all trips in Eastham are via the private automobile. Bus ridership, walking and bicycling together total only 5% of trips. In part, this reflects the fact that existing year-round public transportation services are limited. Similarly, the appeal of bicycle transportation is constrained by the absence of east-west bike paths outside the National Seashore, and the lack of bicycle racks and secure storage bins at commercial centers in both Eastham and Orleans. However, a

long-awaited bicycle overpass has been constructed at the Eastham/Orleans Rotary, which allows cyclists a safe, direct route from downtown Orleans into Eastham.

The value of Eastham's 45 miles of Town roads is estimated at $15 million plus an annual expenditure on maintenance and repair to preserve that investment. In addition, the State owned portion of the transportation system (Route 6) is worth several millions of dollars more. Currently, there is adequate capacity throughout the system to meet all but the summer travel demands. Peak travel demand on Route 6 during the summer results in severe congestion in South Eastham leading to the Rotary, near the signalized intersections in Town, and merge at the Wellfleet line. Although the capacity constraints occur primarily during the summer, safety problems occur on a year-round basis. Based on the latest available accident records, Route 6 in Eastham has a higher accident rate than any other section of Route 6 on Cape Cod. It appears that conflicts between through traffic and local turning traffic along the four-lane highway are largely responsible.

The former New York, New Haven & Hartford Railroad was sold to the Commonwealth who subsequently cleared the track to pave a bicycle and pedestrian trail known as the Cape Cod Rail Trail. This former railroad bed runs the length of Eastham, approximately six (6) miles, crossing under Route 6 near Old Orchard Road. The Commonwealth maintains this facility. Although there are no large-scale public parking facilities in Eastham along this path, there are small unpaved areas adjacent to the trail, which accommodate fewer than six cars. In addition, the Cape Cod National Seashore maintains a bicycle trail from the Salt Pond Visitors Center to Coast Guard Beach, both of which provide parking facilities. The Cape Cod National Seashore bicycle path and the Cape Cod Rail Trail are connected via a signed bicycle route along Locust Road.

Public transportation to and from Eastham is limited. The Plymouth & Brockton Street Railway Company (P&B) makes a regular stop at and across from the Town Hall on Route 6, and provides service from Hyannis to Provincetown and points in between. Additional stops are provided, as needed, requiring the passenger to hail the bus or request a drop-off along Route 6. During the winter, P&B operates two buses between Provincetown and Hyannis, and during the summer operates five buses.

The Cape Cod Transit Authority runs an on-call transportation service called the B-Bus. Reservations must be made at least a day in advance for this service which provides passengers a ride from their home for medical appointments, shopping trips and other errands. The Eastham Council on Aging provides van service for residents over sixty to medical appointments and shopping areas. The Council also provides transportation to special programs, events and field trips for seniors. Taxi service is available from Nauset Taxi in Orleans but requires advance scheduling and a fee. Free summer bus shuttles are operated by the National Seashore between the Little Creek Parking area and Coast Guard Beach.

### *Water Supply Systems*

The Outer Cape is underlain by sandy sediments saturated with fresh water derived entirely from precipitation. Of the 40 to 47 inches of annual precipitation on the Outer Cape, about half is lost to evaporation, transpiration and direct runoff. The remainder percolates through the ground and collects in lens-shaped bodies of freshwater which float over sediments saturated with denser saltwater.

Eastham's water is withdrawn from the Nauset Lens of the Cape Cod Aquifer. A 1993 study by the USGS determined that the northern edge of the Nauset Lens discharges at Blackfish Creek and Drummer Cove in South Wellfleet, and the southern edge of the lens discharges at Rock Harbor Creek and Town Cove at the Orleans-Eastham town line. The ground water table roughly following the land elevation rising in a dome of up to 17 feet above mean sea level (= 17 feet NGVD; National Geologic Vertical Datum) beneath the portion of the Eastham outwash plain in North Eastham to the east and west of Route 6 and North Sunken Meadow Road.

There is only one type of water delivery system in Eastham -- private wells. Most are on-site domestic water supply wells drawing about 200 GPD. Some are small volume wells, serving various businesses and office buildings for which the withdrawal volume has not been estimated. In a Cape Cod Commission study, "Small Volume Well Inventory and Prioritization Project", 67 registered and unregistered small volume wells are listed: three (3) are nontransient-noncommunity public water supply (NTNCPWS) systems, 38 are transient-noncommunity public water supply systems (TNCPWS), and 26 are unregistered water supplies. There are no areas of Eastham served by a municipal water supply system with the exception of nineteen services near the Orleans town line, which are connected to the Orleans public water supply.

The Outer Cape Capacity Study (1996) recommends that the Route 6 corridor and landfill areas in Eastham be considered for the development of public water supply systems. As many as one in every five wells along the corridor exceeded nitrate levels of 5 mg/L between 1985 and 1994. The study predicts that as buildout approaches, that number will increase to one in every four wells. A 1990 USGS survey identified two potential sites for development of municipal water supply wells should such service become a necessity in the future. These sites are identified as site of hypothetical public-supply well "A", located in Eastham Water Resource Protection Zoning District "G", and as site of hypothetical public-supply well "B", located in Eastham Wellfield Protection Zoning District "H". The cost of providing public water to the Route 6 corridor and landfill areas is estimated at $6 to $9 million dollars in capital expenses and around $500,000 in operational expenses.

### *Sewer Service*

There are no areas of Eastham that are served by public sewers. Only on-site sewage

disposal systems are used throughout the Town. These systems include cesspools, Title 5 septic systems and "innovative technology" disposal systems such as those using a peat bed to reduce nitrate nitrogen concentration in effluent discharge and bioclear systems. Eastham is a member of the Tri-Town Septage Treatment facility located in the town of Orleans. This facility serves the communities of Eastham, Orleans, and Brewster. The facility management is responsible for operation and maintenance of the plant. The Eastham Board of Health prepared a Town inspection and maintenance program that was implemented during 1997. System upgrades are required when property is conveyed or improved, and when an existing system fails or exceeds four pumpings per year.

***Future Land Use and Development Trends***

There are approximately 1,200 acres of vacant, developable land with the potential for additional residential development. The prospective residential buildout for Eastham under the current zoning is approximately 734 additional housing units resulting in a total of 6,000 units at buildout. Over the last 25 years Eastham has averaged over 100,000 new housing units per year. Using that average rate, Eastham could reach residential buildout in 2006. The buildout figures do not account for approximately 400 grandfathered lots that are below the current zoning requirements but are protected under MGL.Ch.40A. While these grandfathered lots could be built without regard to current zoning, they are subject to other town by-laws and regulations. That, combined with the lack of sewer or water service, will reduce the number of potential units.

There are approximately 37 acres of commercial land and 25 acres of industrial land available for development. If all the land is used, there could be eleven and one-half (11.5) acres or about five hundred thousand (500,000) square feet of gross floor area of commercial development and seven and one-half (7.5) acres or about three hundred and twenty-seven thousand (327,000) square feet of gross floor area of industrial development. It should be noted that most of the vacant industrial land has inadequate access at this time due to lack of frontage on a public way.

Major challenges face the Town including whether future development will change the character of Eastham, and how to pay for the increased demands placed on municipal services by the development of the remaining vacant land and conversion of seasonal to year-round housing units. The configuration of the Town, its existing land use pattern, traffic problems along Route 6, fiscal constraints and lack of a public water supply or sewers limits the options. Presently land use development is guided by local ordinances, in accordance with the MGL, Chapter 40A (The Zoning Act) and Chapter 81 (The Subdivision Control Law). While zoning and by-laws generally reflect the community's desire for the location of residential, commercial and industrial development, often the community is unaware of the full potential and long range consequences of building to the maximum extent allowed by law. Buildout can be as difficult to imagine now as it would have been for Eastham residents in 1930 or even

1950 to imagine the Eastham of today.

## Section IV: Environmental Inventory and Analysis

### A. Geology, Soils and Topography

***Geology***

Cape Cod owes its existence to glacial deposits derived from the last ice sheet, which moved over southeastern New England. Glauconite, fossil material, and the sparsity of feldspar in the glacial sand suggest that the ice sheet overrode coastal plain and shelf sediments of Pleistocene and pre-Pleistocene age before reaching Cape Cod. During deglaciation of southern New England, the topography of the continental shelf played a major role in determining the pattern of ice retreat. Major lobes formed in the relatively shallow basins on the shelf.

When the Cape Cod Bay lobe had retreated to approximately the present south shore of Cape Cod Bay, the Harwich outwash plain deposits were laid down. The great extent of the outwash plain and the Sandwich moraine indicate a major standstill during the deposition of these features (Mather, et al, 1942). The glacial deposits on outer Cape Cod, including the Nauset Heights outwash and Eastham plain outwash were deposited after the Harwich outwash deposits. During this time, the Cape Cod Bay lobe was either depositing ice-contact lacustrine sediments north of the ice-contact head of the Harwich outwash plain or it was retreating across Cape Cod Bay. West and southwest surface gradients on the Eastham plain and the outwash plains further to the north indicate they were deposited by meltwater draining the South Channel lobe (Oldale, 1968; Koteff et al, 1967).

Till interbedded with and overlying the Nauset Heights outwash deposits may have been deposited during re-advances of the Cape Cod Bay or South Channel lobes, or as flowtills. Retreat of the ice away from the ice-contact head of the Harwich outwash plain caused the development of a preglacial lake between the retreating ice front and the glacial deposits to the south. The lake eventually occupied most of Cape Cod Bay.

During the deposition of the sediments on outer Cape Cod, which include the Wellfleet plain, Truro plain, and Highland plain deposits (Koteff, et al, 1967; Oldale, 1968), the Cape Cod Bay lobe retreated northward in Cape Cod bay to drain eastward through Town Cove which resulted in a lake stage lower than present sea level. Meltwater streams draining the ice near Nauset Beach Lighthouse deposited the Eastham plain deposits. Older sediments of the Eastham plain were deltaic and graded to the low stage of the lake. All the deposits above sea level are fluvial; they were deposited by streams that flowed westward and eventually eastward between the ice-contact head of the Nauset Heights deposits and ice that occupied the marsh filled embayment south of Nauset Bay. Continued northward retreat of both lobes terminated glacial deposition and, when the ice lobes had retreated north of High Head (Truro), the lake in Cape Cod Bay drained completely.

Direct effects of glaciation on Cape Cod ceased about 18,000 years ago when the ice had retreated some distance north of Boston (Kaye and Barghoorn, 1964). Eustatic sea level was about 400 feet below its present level (Edmary and Garrison, 1967), and the ocean was ten or more miles from the present shoreline. With the waning of glaciation, water previously trapped in the ice melted, resulting in a rapid rise in eustatic sea level. Approximately 6,000 years ago, marine waters reached the vicinity of Cape Cod (Ziegler et al, 1965), and extensive erosion of glacial deposits occurred. The shoreline reached its present position in relation to the glacial deposits about 3,500 years ago (Redfield, 1965).

Sea cliff erosion of glacial deposits provided sediment for the growth of spits. North of Nauset Bay and First Encounter Beach where spits had not developed, the glacial deposits in the sea cliffs are being eroded by waves. The average rate of erosion along the Atlantic shore is about 3.1 feet per year (Ziegler et al, 1964); along the Cape Cod Bay shore it is somewhat less. Major changes in the shoreline resulting from erosion and deposition occur primarily during storm events coupled with "Spring" tides.

When erosion threatens structures, which are not easily relocated, such as the numerous cottages along the Cape Cod Bay cliffs, property owners have sought to stabilize the bank with engineered structures such as bulkheads or revetments. The net effect of these structures is to reduce the amount of sand available to the beach and consequently the barrier beaches at Sunken Meadow and First Encounter. Various alternatives have been utilized, such as nourishment using sand from inland sources, "soft" solutions using sand bags, vegetative cover and sand drift fencing.

The alignment of the seaward shore of Nauset Beach and the cliffs cut in the glacial deposits to the north suggest that the shoreline is retreating westward at a constant rate. Material eroded from the glacial deposits is transported by waves and currents and eventually deposited at the distal end of the spits as shoals or beach deposits. During storms the seaward shore of the spits is eroded and beach deposits are deposited several feet above normal high tide. Locally, storm waves cut channels (storm sluices) through the spits and dunes, carrying material into the lagoon where it is deposited as overwash fans, which re-vegetate in succeeding seasons.

Rates of erosion are sporadic and can change significantly based on changes in offshore sand bars, or the severity and timing of storms. Throughout the 1990s the Nauset Light Beach area had accelerated erosion rates, and, as a result, the lighthouse structure was in danger of collapsing into the sea. A coordinated effort of private citizens, the Cape Cod National Seashore and the U.S. Coast Guard provided for the safe removal of the structure to a more landward location to a location 150' to the west in the fall of 1997. A sequence of storms beginning in fall 1990 obliterated some of the dunes at Coast Guard Beach and revealed evidence of Native American habitation. A team of National Park Service archaeologists completed a detailed examination of the

site over the two subsequent winters and documented valuable information about the site and its uses by its inhabitants between 1,200 and 2,500 years ago.

Freshwater peat deposits probably began to develop in kettle holes and stream valleys shortly after deglaciation. Poor drainage in the sandy deposits was caused by permafrost, and altered by the rise in the water table resulting from postglacial rise in sea level. Salt water peat deposits probably began to develop about 6,000 years ago in kettle holes submerged by the rise in sea level. Evidence from Nauset Harbor in Nauset Marsh indicates that at least as long as 1,200 years ago, salt marsh was present. Other salt marshes may have formed extensively as much as 3,000 years ago, which would have followed the growth of spits that provided sheltered lagoons.

***Soils***

The climatically associated soils on Cape Cod are podzols. Their existence in this less than normal hostile climate is due to the porosity of the glacial material and the rapid leaching associated with it. The remaining sediments that are characteristic of the Eastham area are interior and coastal sands deposited by wind actions either along the present coast and associated with wave action or those sands associated with direct glacial deposition. Wet sediments found in and near salt marshes and freshwater swamps are also quite prevalent, particularly in southern and coastal Eastham areas.

***Topography***

Like most of Cape Cod, Eastham's terrain is level to gently rolling with land mass elevations generally from sea level to sixty feet above sea level. Perhaps the most significant feature of the topography is the nearly one half of the Town covered by water. Eastham might be considered the "low country" of the Cape, with many points of saltwater infiltration occurring at elevations below sea level. The most dramatic topographical features occur along the Atlantic Ocean coast where steep cliffs or bluffs are formed by the erosion of sand dunes.

## B. Landscape Character

Eastham's natural beauty is one of its greatest assets. Scenic vistas on the bay and ocean front along with the variety of landforms give the landscape a character that attracts many visitors and enriches the life for "locals" year-round. Within the Town are marshes, bogs, woodlands, ponds and miles of shoreline. Looking out over the Nauset Marsh, past the barrier beach to the breaking waves or surveying the tidal flats at First Encounter Beach that stretch further than the eye can see are unique experiences even on the Outer Cape. Local residents have listed proximity to water as one of the best things about living in Eastham, including the oceanfront and the beautiful fresh and salt water ponds that dot the area.

With its reliance on tourism for economic survival, it is certainly in the Town's best interest to preserve and protect these unique vistas and areas. It is worth noting that even those visitors staying in the Mid or Upper Cape will schedule a visit to the Outer Cape because of its unrivaled beauty and many recreational opportunities. If the area should begin to look "just like everywhere else", there will be no reason for tourists to visit and those who live here will no longer feel a special connection to nature, the out of doors and the water that brought them in the first place.

## C. Water Resources

### *Surface Water and Wetlands*

Wetlands habitat comprises more than twenty-five percent (25%) of the land area of Eastham, both within and outside of the boundary of the National Seashore. The vast majority of these areas are salt marsh (1,300 acres) fresh water ponds and vegetated wetlands (475 acres). Some seventeen (17) vernal pool habitats have been described or certified through the State's Natural Heritage and Endangered Species Program.

The salt marsh systems bordering Cape Cod Bay have all been included in one or two Areas of Critical Environmental Concern: the Inner Cape Cod Bay area and the Wellfleet Harbor area. Included in these areas are critical habitat areas for Diamondback Terrapin and Piping Plover. Nauset Marsh has not been so designated, although the majority of this system within the Town's boundary lies within the National Seashore thus preventing significant changes. The barrier beach known as Nauset Spit is habitat for various threatened and endangered species such as plovers and terns, which depend on the aquatic food sources nearby. The entire estuary and Town Cove represent an important spawning and nursery area for finfish, shellfish and lobsters. Both white cedar and red maple swamps border the coastal resources areas. Other bordering vegetated wetlands extend from the many fresh water ponds and transition areas along salt marsh systems.

Two anadromous and catadromous fish runs are maintained by the Town at Herring Pond and the Great Pond (Cole Road) system. The kettle pond area of the mid-section of the Town is connected by a variety of trenches, ditches and culverts to allow the migration of these fish through several hundred acres. Two ponds, Great Pond and Herring Pond, have been the subject of scientific evaluation through the Massachusetts Clean Lakes program to determine the well being of the pond and to recommend preventative and restorative measures with regard to water quality, fisheries habitat and recreational uses. The results of the diagnostic phases of these works suggest that the ponds are in relatively good health with good species diversity, and minimal eutrophication. The feasibility study of Great Pond included various methods of adapting swimming areas to coexist with macroalgal species and watershed sampling.

Starting in 2001, a joint effort by the Cape Cod Commission, Cape Cod National Seashore and the Eastham Ponds Stewards began monitoring ten (10) of Eastham's ponds for water quality. The results indicate that all but Minister Pond are in relatively good condition. Minister Pond merits closer scrutiny.

It is estimated that some two hundred (200) acres of wetlands area have been altered as a result of development since 1970. This acreage includes projects completed before the Wetlands Protection Act, a series of small development projects, which were initially permitted under the Act, and the cumulative degradation of the West Shore beaches as a result of effects of revetments and other coastal engineered structures. Two salt marsh remediation projects have recently been undertaken which will lead to improved conditions, including the reduction in the quantity of invasive populations of phragmiates. Tidal flow was improved in the upper reaches of Boat Meadow Creek due to the installation of a large culvert as part of the bike trail extension. Tidal flow was also improved in Abelino's Creek due to the removal of the upper layers of an old dike. Phase Two of the Abelino's Creek restoration is proposed for the near future.

***Analysis***

The need to assess and identify those critical environmentally sensitive areas in Town which deserve particular attention and review through various regulatory agencies has been established. Joint meetings with the Conservation Commission, Board of Health and Water Resources Advisory Committee have been initiated in an effort to systematically review development projects in those areas recognized as sensitive with regard to development or renewal of development such as seasonal conversions. It is essential that the review process be conducted in an integrated fashion among the various appointed boards and committees. This process has been started.

The Board of Assessors and Conservation Commission have identified the concept of Conservation Restrictions as a valuable tool to providing tax relief in exchange for restrictions on development of properties, which are identified as significant habitat areas. To date, eight (8) such parcels of land are protected including several areas identified as containing critical habitats.

The Kettle Ponds Area concept was developed to link several areas in the vicinity of the various kettle ponds in the central part of Town together with their respective habitats of woodlands and wetlands. This linkage provides a significant corridor for migration of various species. The Town recently acquired one of the two remaining parcels of land, and the second is currently in negotiation. Off-road vehicle use is not permitted anywhere in the Town by regulation and by-law. This policy should be maintained to protect these sensitive areas.

The identification of additional vernal pools for certification should be a priority and can be accomplished through a volunteer effort with assistance from Town departments and

staff. Such designation permits greater statutory regulation under the Wetlands Protection Act and Cape Cod Commission Regional Policy Plan as well as local by-laws.

Currently, projects in Areas of Critical Environmental Concern (ACEC) are regulated by local by-laws more rigidly than under State regulation. The areas within the ACEC have been included in the definition of "resource area" and regulations prohibit any dredging or filling within the boundary of the ACEC. Additionally, local regulations prohibit the replication of inland wetlands entirely.

A careful analysis of the ponds, vernal pools and mapped critical wildlife habitat areas should be implemented. Comparison with the previously collected data under the Clean Lakes program will provide insight as to the adequacy of current regulations in protecting these areas, and will identify those areas, which need remediation under the current Wetland Protection By-law or the Board of Health regulations.

***Coastal Resources***

The coastal resources of Eastham are divided between Cape Cod Bay (the west shore) and the Atlantic Ocean (east shore) including Nauset Marsh and Town Cove. The Bay shoreline extends approximately 5.5 miles and is a mixture of coastal bank deposited by glacial activity, barrier beaches which form and protect extensive salt marsh systems and coastal dunes. The Town owns and maintains seven (7) public beach areas along this shoreline with a total parking lot capacity of some five hundred (500) vehicles. A listing of those Town-owned beaches and parking areas follows.

## Table 3

## Town-owned Beaches and Parking Areas

| Beach | Parking |
|---|---|
| South Sunken Meadow | 26 |
| Cooks Brook | 85 |
| Campground | 119 |
| Thumpertown | 18 |
| Cole Road | 12 |
| First Encounter | 199 |
| Boat Meadow | 10 |

The parking facilities serve an area which totals approximately 1,500 linear feet of public beach front (0.3 miles). No lifeguards are provided at these beaches due to the nature

of the tidal action. Average depth of water is eight (8) feet along the beaches at high tide, and at low water sand bars extend up to one mile offshore. Numerous private access points to the shore are maintained by local associations of homeowners.

Two barrier beaches, located at Sunken Meadow and First Encounter beaches, have been created by sand transported by tidal action and the wind. Landward of these barrier systems are extensive salt marsh systems, which have tidal creeks. Other salt marsh systems include Boat Meadow and Rock Harbor. All of these systems have been designated as Areas of Critical Environmental Concern (ACEC). In total, they contain approximately four hundred (400) acres.

Rock Harbor is located at the southern extremity of the Town and is shared with the town of Orleans as a (tidal) port for recreational and commercial fishing vessels. Eastham maintains some forty-five (45) slips for dockage of boats and a parking area with a boat launching ramp is maintained by the Public Access Board of the Commonwealth. Periodic dredging of this harbor continues on an erratic schedule. The most recent activity was completed in 1992, with the dredge spoil being deposited in several nearby shoreline locations. Dredging is scheduled to begin in the spring of 2004 and the material will be used on site.

Billingsgate Island, scarcely visible except at low tide, is presently a mere fraction of its former self. Once an upland area, which supported a community of residents, tidal action reduced the volume of land to a shoal area. This foreshadowing of the future of the rest of the Cape forced the removal of the dwellings and people some time ago, but the resource as a productive shellfishing ground still exists. The corporate boundary of the Town extends three (3) miles further into Cape Cod Bay and within that area are productive grounds for the harvest of quahogs, sea clams, and bay scallops. Recreational fishing for both finfish and shellfish is common along the entire shoreline.

On the opposite side of the Town, Eastham's "back shore" faces the Atlantic Ocean, which consists for the most part of high bluffs of glacial till exposed to coastal processes. Much of this sand has been transported southerly to form the Nauset Spit, a barrier beach which created and protects the Nauset Marsh system and adjacent Town Cove. The salt marsh system covers approximately eight hundred (800) acres and is an extremely productive nursery area for both fin and shellfish species. Shellfishing is an ongoing activity in the marsh with both recreational and commercial activity being sustained and encouraged. The Town has developed numerous programs to supplement the natural production of shellfish species including relays, aquaculture methods to raise seed for the "wild" fishery, predator control programs and water quality monitoring.

Private shellfish aquaculture sites continue to operate in various areas of the marsh and Cove as they have historically done. The Town is currently addressing the recent interest in aquaculture by developing and permitting larger scale "Aquaculture

Development Areas". These large sites, which abut Town property in Cape Cod Bay, will be leased to individuals. By streamlining the permitting process and providing areas not subject to upland property owners' objections, it is anticipated that aquaculture activities will be encouraged. The Town has established an aquaculture technology center at Hemenway Landing and a program to create "pre-licensed" community farm aquaculture areas through its Natural Resources Department. The training center also serves as a hatchery for producing seed oysters and clams.

The corporate boundary of the Town divides Town Cove from sections of Nauset Marsh. Historically, residents of each town have "enjoyed the rights to the shellfishery" as if they were residents of the other Town since the political separation of Orleans from Eastham in 1797. Since division of resources based on political rather than biological or other scientific strategies does not make sense, the two towns have cooperated closely on all aspects of management of the water bodies in question.

The majority of Eastham's shoreline along the back shore remains undeveloped beyond the establishment of the Cape Cod National Seashore. Two beaches are maintained on the Ocean at Nauset Light and Coast Guard sites. Both facilities are operated by the Seashore and include restroom facilities as well as lifeguards. Three Town landings are maintained along the marsh and Cove and serve as boat launching areas. Swimming is limited at these sites.

***Analysis***

The overwhelming majority of the shorefront in Eastham along Cape Cod Bay is eroding at various rates ranging from more than two (2) feet per year to less than one-half (1/2) foot per year. The response by property owners has been to construct structures to prevent the loss of their property with the resulting loss of active beach, "end effects" which encourage neighbors to imitate the activity, and finally a loss of sand to adequately nourish the barrier beach systems at the extremities of the Town. If a landowner chooses to take erosion control measures, the Town now requires that they be "soft" rather than "hard" solutions, but significant damage has already occurred. Mitigation is also required in the form of annual renourishment of sand, in an effort to preserve the dynamic beach system. Even so, nourishment of Town-owned beach areas is a significant problem increasing in scope.

As the densely developed areas along the shore are converted to year-round use, or expanded to include more housing on substandard lots, septic issues and the subsequent low level impact of foot traffic and other incidental pressure increases. Access to and use of the beachfront property is an issue of increasing concern as certain property owners are attempting to exercise their property rights to mean low water (a considerable distance) and prevent such activities as bathing, boat moorings and shellfishing in front of their property. While not excessive at the present time, these owners represent a trend increasing at a regular rate. This may be a result of the recent

relocation of residents from more urban areas that arrive with an attitude of needing complete privacy from their neighbors and an unwillingness to share what they have with visitors and year-round residents.

Dredging of Rock Harbor should be conducted on a five (5) year basis to ensure the least amount of disruption of navigation and safety. Previous projects have been completed only when the harbor proper was not navigable at low tide. The dichotomy of excess sand in Rock Harbor, which needs to be removed, and the lack of beach material along the eroding shore of the Bay suggests the possibility of an integrated solution. A process should be implemented whereby the amount of material needed to stabilize eroding beaches, the amount of material estimated to be available in Rock Harbor, the timing of the transfer and the cost of the project are evaluated and balanced.

Due to the lack of any other harbor facilities, there appears to be a limitless demand for services at Rock Harbor despite the fact that it is subject to tidal action. The limited number of slips cannot meet the need, but the expansion of dock facilities must be weighed together with loss of marsh and increased traffic along access roads. A Harbor Management Plan for the Town should be investigated in light of the framework provided and guidelines for dredge activities. However, a great deal of effort is required to complete such a plan and the constraints of Rock Harbor itself may be self-limiting.

Docks and piers constructed along the shore of Town Cove present an ongoing concern with regard to the access along the shoreline as well as effects on shellfish habitat. Issues such as increased turbidity, loss of areas, and conflict of use are concentrated along this section of Eastham's shoreline. In 1999, by-laws were amended to encourage community access docks and piers.

There has been a dramatic increase in recent years of both boat moorings and on-shore small boat storage. A permitting program is in place, which regulates both the quantity and locations. Extensive mooring fields are to be found at Hemenway Landing, Great Pond, and along the entire Cape Cod Bay shoreline.

All of the salt marsh systems along the west shore are currently closed to shellfishing activity due to an administrative closure order issued by the Environmental Protection Agency (EPA). Sanitary surveys of these areas have not been completed at the present time, but high coliform bacteria counts in samples suggests that these areas would not meet water quality standards. In Nauset Marsh and Town Cove, several areas are subject to "seasonal closure" or "rainfall closure" due to road runoff, which is channeled directly in shellfish growing areas. These areas are in critical need of attention and protection.

With the understanding that changes periodically take place to the inlet of the Nauset Marsh system which increase flood potential for low lying lands, some effort should take

place to identify potential High Hazard areas on FEMA maps. During a few years in the early 1990s when two inlets established, more tidewaters are able to enter the system, but not necessarily exit on the low tide; thus, with a series of easterly gales, which drove tidewaters into the marsh, numerous instances of flooding have occurred. In fact, the one hundred (100) year flood elevation has been achieved several times in a few years. The FEMA maps need to be reviewed in light of different barrier beach configurations. At a minimum, development in boundary areas or within hazard areas should be scrutinized.

## D. Vegetation

As described in Section III, Eastham's original forest was stripped in the early years of the area's settlement. With soil depletion from agricultural activities, wind action in exposed areas and frequent forest fires and repeated cutting, regrowth of most species has been inhibited. A large percentage of Eastham is covered with open pine barrens, particularly its northern and western sections.

Far from being a "natural" landscape, these woods are a direct result of Eastham's agricultural history. Pitch pines and locusts, which are the common species that seed in abandoned fields, are unusually numerous in Eastham. Red cedars usually mark the site of a former pasture rather than a plowed field. Young cedar seedlings, unlike pines and locusts, can survive the repeated grazing by cattle and sheep. In fact, in the few open field habitats still maintained on the Outer Cape, one can find among the mown grass tiny prickly red cedar plants, no more than a few inches high, which may be decades old. These hardy survivors bide their time, and, once these fields are abandoned, quickly rise up and colonize them.

Much of the second growth forest on Cape Cod has been described as ordinary and not of any particular importance. Yet it is these forests that make up much of the undeveloped woodlands on the Cape. The most prevalent pine variety is the pitch pine. The oak species most common include scrub oak, white oak, red oak and pin oak. These "ordinary" forests will over time increase in significance as they grow increasingly scarce. As the title implies, second growth pine/oak forest has sprung up on formerly cultivated lands that once were forested with a diversity of hardwood species. The pines and oaks are often 30 to 50 years old. In the natural process of forest succession, pitch pine forests are reaching their maximum age and are gradually being replaced by oak and a few other hardwood species. As the pines age, they become susceptible to invasions by beetles, as is evidenced by the abundant dead or dying pitch pines throughout Eastham. These areas are considered the Cape's prime developable land and provide important upland wildlife and plant habitat. It is important to note that between 1971 and 1990, 1,311 acres of forest were lost to development in Eastham (Outer Cape Capacity Study, 1996).

Pitch pine/scrub oak barrens flourish on the relatively level sandy soils found on the

Outer Cape. The pitch pine (*Pinus rigida*) occurs in an open pattern and has a dense understory of scrub oak (*Quercus ilicifolia*). Pitch pine is a relatively hardy tree that has a natural resistance to fire, due to its thick bark. The scrub oak understory shares the open spaces with plant species such as Bearberry (*Arctostaphylos uva-ursi*) sedges (*Carex spp.*) and lichens (*Caladonia spp.*) Heathlands, or communities of low growing shrubs, are also numerous. They include species such as Bearberry and Black Huckleberry (*Gaylussacia baccata*).

In addition to the forested areas, Eastham is also characterized by freshwater wetland and salt marsh vegetation. Freshwater wetlands include wet meadows, marshes, swamps, bogs, vernal pools, streams and ponds. Atlantic white cedar swamps are found in low areas of the coastal plain that are covered by standing water where the sandy soil is topped by a saturated peat layer. It is not unusual for standing water to be present at least half of the growing season. Atlantic white cedar (*Chamaecyparis thyoides*), an evergreen of the cypress family, is the characteristic tree found in the swamp. It is common to find a shrub layer of hollies in association with cedar swamps such as Common winterberry (*Ilex verticillata*) and Inkberry (*I. Glabra*) as well as ericaceous, or heath like shrubs, such as Sweet Pepperbush (*Clehra alnifolia*), swamp azalea (*Rhododendron vicosum*) and poison sumac (*Rhus vernix*). The few remaining cedar swamps on the Cape are thought to be remnants of as much as 6,000 acres that existed when the Pilgrims arrived. The bogs were mined for their peat and the trees provided a source of fence posts and cedar shingles. The swamps were also converted to cranberry bogs and cleared for agriculture.

Vernal pools are important wildlife habitat for a variety of amphibian and invertebrate species, some of which are completely dependent on the pools for their survival. The temporal nature of the pools precludes the establishment of fish populations. Without predation by fish, amphibian eggs and larvae are able to mature, making these pools ideal habitat for certain species of frogs and salamanders, as well as other invertebrate species. These pools are particularly susceptible to changes in surface topography and hydrology and the introduction of pollutants through stormwater.

Salt marshes are one of the most biologically rich ecosystems in the world, as they nourish and shelter an abundant array of shellfish, fish, birds and even people. The salt marsh exhibits definite zones in the arrangement of its plant species. The limits of the marsh zones are determined by plants' responses to varying salinity and the frequency of tidal flooding. This separation is most easily seen in the occurrences of the marshes' two most dominant plant species: the coarse, broad-leafed salt marsh cord grass (*Spartina alterniflora*) along the edge of the water, and the smaller salt meadow cord grass (*Spartina patens*) common to the largest and intermediate sections. Bordering the upper zone between high marsh and land vegetation is seaside goldenrod, blackrush and panic grass. Higher marsh ground that receives influxes of fresh water is colonized by cattails and phragmities.

An important but isolated habitat in Eastham is the Sand Plain Grassland, which is a state listed endangered habitat. The primary characteristics of the habitat are grasslands of droughty, low nutrient soils dominated by little blue stem grass (*Schizachyrium scoparium*), Pennsylvania sedge (*Cares pensylvanica*) and poverty grass (*Danthonia spicata*). Other common inhabitants are bearberry (*Arctostopyhlos uva-ursi*), scrub oak (*Quercus ilicifolia*) and stiff aster (*Ionactis linariifolius*). Some animals that benefit from open habitats like Sand Plain Grasslands are bobolinks, grasshopper sparrows (*Ammodramus savannarum*), a number of small animals and birds of prey such as owls, northern harriers (*Cirus cyaneus*), and other hawks. Sand Plain Grasslands are an early successional stage of plant community development, and are maintained by factors such as fire, salt spray, or mowing. Threats to this habitat are invasive plants, development and forest succession.

In honor of the 350th anniversary of the incorporation of the Town of Eastham, and due to a strong interest in creating a lasting legacy, the 1651 Forest project came about. The overall goal is to utilize a section of Wiley Park, where groves of compatible trees and underbrush will be planted to provide a forest that typifies those that existed approximately 350 years ago. There is a Friends group responsible for carrying out the planting plan and other tasks associated with the maintenance of the forest. Several species have been planted to date.

***Analysis***

All of Eastham's critical natural resources are sensitive to development pressures as well as increases in population and the accompanying recreational pressures. The primary threats to each of these resources are described in Table 4.

Each specific type of critical natural resource listed above has a threshold for tolerance to impacts from development or recreational use. Development results in a variety of impacts on natural resources including clearing of land, creation of impervious surfaces that prohibit groundwater infiltration, drainage changes, erosion and sedimentation, elimination of habitat, introduction of nutrients from septic systems, changes in groundwater flow due to large numbers of private wells, noise pollution and disturbance of habitat and visual impacts.

One of the greatest threats to the critical natural resources of Eastham is reduction, fragmentation and elimination of woodland habitat. For residential development, the amount of cleared vegetation for roadway and structures typically ranges between 40% and 80%. It is not unusual for a residential or commercial site to be completely stripped of vegetation prior to its development. Removal of vegetation reduces or eliminates the ability of wildlife to breed, feed, take shelter and survive. It is important to maintain unfragmented tracts of forest of sufficient size to support the Cape's overall diversity of wildlife species. Too often, developments contain inadequate wildlife corridors that provide little functional wildlife habitat, and are of little value to wildlife that require

interior forest habitat.

## Table 4

## Threats to Natural Resources

| Resource | Threat |
|---|---|
| Salt marsh | Dredging and filling (esp. docks/marinas)<br>Adjacent development<br>Ditching for mosquito control<br>Excessive nutrient loading<br>Stormwater runoff |
| Quaking/Sphagnum Bogs<br>Cedar swamps | Stormwater runoff<br>Nutrient loading<br>Adjacent development<br>Changes in hydrology |
| Vernal pools | Changes in hydrology and surface topography<br>Stormwater runoff<br>Adjacent development<br>Direct loss to development<br>Lack of protection (unidentified and uncertified)<br>Drawdown of the water table |
| Herring runs | Reduced stream flow<br>Obstructions that block fish passage<br>Over fishing |
| Coastal Plain Pond Shore | Groundwater withdrawal and drawdown<br>Trampling of vegetation<br>Off road vehicle use<br>Nutrient loading<br>Stormwater runoff<br>Adjacent development |
| Barrier beaches | Alteration by development<br>Shoreline protection structures<br>Sediment starvation<br>Off road vehicle use |
| Hardwood tree stands/<br>Unfragmented forest | Direct loss to development |

Source: Outer Cape Capacity Study, Cape Cod Commission, 1996

***Special Concern, Threatened and Endangered Species:***

In the section for plant species, and for the wildlife listed in section E., the following definitions, as identified by the Massachusetts Natural Heritage and Endangered Species Program, will be applied:

*Special Concern*--This category includes any species of plant or animal, which has been documented by biological research and inventory to have suffered a decline that could threaten the species if allowed to continue. Also, any species that occurs in such small number or with such restricted distribution or specialized habitat requirements that it could easily become threatened in Massachusetts.

*Threatened*--This term applies to any species of plant or animal likely to become endangered species in the foreseeable future through all or a significant portion of its range. It also defines any species declining or rare as determined by biological research and inventory and likely to become endangered in the foreseeable future.

*Endangered*--This classification refers to any species of plant or animal in danger of extinction throughout all or a significant portion of its range, and species in danger of extirpation as documented by biological research and inventory.

***Plants***

PLYMOUTH GENTIAN (*Sabatia kennedyana*) --Endangered-- the tall, branched flowering stalk rises out of a basal rosette of oblanceolate leaves. The terminal pink flowers have one to ten petals and a yellow center fringed with red. It blooms in August and September. Found only on sandy to peaty beach margins of some kettlehole ponds of the coastal plain, it occurs predominately on gently sloping north and west shores. The water level of the ponds must fluctuate periodically to inundate the margins and stop invading shrubs.

This species is rare throughout its limited, disjunct range and the New England Botanical Club considers it rare in New England (Rhodora, 1981). It is known only from small areas of southern Nova Scotia, Massachusetts, Rhode Island, North and South Carolina. Plymouth Gentian is on the rare and endangered species lists of all of these places. It does not occur in intervening areas. The cause of rarity is development and the limited range of the species. Recreational use of ponds on the coastal plain leads to trampling and destruction of this habitat. Pond contamination from run-off and faulty septic systems is also a problem.

BUTTERFLY-WEED (*Asclepias tuberose)* --Special Concern-- is a tall (3-9cm) pubescent plant with large linear-to-oblong leaves growing singularly on the stem. Unlike most milkweeds, it does not have milky juice. Butterfly-weed has bright orange flowers arranged in terminal umbels, which, in August, are conspicuous in their moorlike

habitats, and most often found in small, localized populations.

COMMONS' PANIC GRASS (*Panicum commonsianum Ashe*) --Special Concern-- is a short (20-50mm), tufted perennial grass that is found in small clumps with several spikelets. This grass flowers and fruits twice each year in the spring and fall. Growing in dry sandy soil of the coastal plain, it is found in dry oak woods, spottily distributed in openings in the ericaceous ground layer, colonizing disturbed soil within the forest where there is little or no litter. At the northern edge of its range in Massachusetts, the destruction of habitat by residential and commercial development has caused its rarity.

PRICKLY PEAR (*Opuntia humifusa*) --Threatened-- is the only cactus widespread in the East. It grows in clumps and has flat fleshy green pads covered with clusters of short reddish-brown barbed bristles. The flowers bloom from the tops of the pads and are large and showy. The large red fruits are juicy, sweet and edible.

In Massachusetts, Prickly Pear grows usually in dry sandy fields and stabilized dunes, often in association with poison ivy and red cedar. Considered rare by the New England Botanical Club, it is listed as rare in Massachusetts where it is at the northern limit of its natural range. People transplant this unusual plant to their gardens, adding to the cause of its rarity.

BUSHY ROCKROSE (*Helianthemum dumosum*) --Endangered-- is a very low shrub-like plant that produces flowers in May and June that are borne in small clusters at the end of elongated branches. Small pinkish asexual flowers appear later on in the season. Bushy Rockrose prefers dry sandy plains with sparse herb layers and is often found in bearberry-huckleberry bayberry-shortgrass moors.

Considered for federal listing as threatened and endangered, it is considered rare in New England by the New England Botanical Club and is listed as rare throughout its range, which includes Eastham. Ninety percent of the known occurrences for this plant are in Massachusetts. A decrease in grazing and fire disturbance followed by forest succession has limited the available habitats for this plant. Bushy Rockrose has a very limited total range and many older stations have been destroyed through development.

BROOM CROWBERRY (*Corema conradii*) --Special Concern--is a low evergreen shrub with dense tufts consisting of diffusely branched stems covered with small linear leaves. Broom Crowberry blooms in April and May with purple flowers. Broom Crowberry is found in open moors and heath lands on the coastal plain. It prefers dry sandy soil and is often found in areas that have been grazed. The species has been crowded out and shaded, as shrubs, scrub oak and pitch pine become established in moorlike habitats due to fire suppression and the cessation of grazing.

## E. Wildlife and Fisheries

A diverse array of habitats within the Town provides for a correspondingly high diversity of plants and organisms. Outer Cape Cod, although somewhat isolated from the mainland, nevertheless attracts many "mainland" birds and mammals, and is especially important because of its "outermost" location to migratory birds. In addition, its unique geographical position and ocean-moderated climate are in part responsible for the presence of many plants and animals at the limits of their northern and southern geographical range.

Mammals living in Eastham include red squirrel, gray squirrel, white-tailed deer, raccoon, red fox, rabbit, skunk, opossum, shrew, muskrat, bat, weasel, mouse, vole, and coyote. In addition to the more common species, birdlife includes songbirds such as the prairie warbler, pine warbler, northern parula warbler, red-eyed viero, cedar waxwing, red-breasted nuthatch, horned lark, black-billed cuckoo and eastern phoebe. Other notable bird species include northern harrier (marsh hawk), osprey, bald eagle, red-tailed hawk, black duck and wood duck. Numerous frog, turtle, salamander, snake and other amphibian and reptile species also make Eastham their home. In addition, numerous pelagic (or open sea) birds are supported by Stellwagen Bank and the waters off Eastham, including fulmars, gannets and shearwaters, and the diversity of fresh and salt water wetland provide habitat for a variety of waterfowl and wading birds.

Wetlands and wetland-dependent flora and fauna predominate. Most important game animals, as well as "passively" enjoyed songbirds, raptors, colonial waterbirds, reptiles, amphibians and of course fish, depend on wetland habitats for food and cover. Coastal swamps, marshes and wet meadows are habitat for deer, muskrat, raccoon, red fox, cottontail rabbits, woodcock, and migratory waterfowl. The shrubby borders of coastal marshlands and kettlehole swamps provide outstanding feeding and nesting cover for songbirds and small mammals. In addition, the beneficial contribution of organic detritus from these coastal marshes to estuaries and near-shore marine systems is well appreciated (Dr. John Portnoy, Cape Cod National Seashore, NPS).

Several agencies are compiling and updating information on special concern, threatened, or endangered species, and many local people provide information to these agencies based on extensive local observation. Scientific staff of the Cape Cod National Seashore monitor rare species within the Park. The U.S. Fish and Wildlife Service conducts field investigations on nationally significant species. The Massachusetts Natural Heritage Program (Department of Fisheries and Wildlife) maintains an ongoing inventory of rare, threatened and endangered plants and animal species, as well as the geographic locations of critical ecosystems.

### *Reptiles and Amphibians*

EASTERN BOX TURTLE (*Terrapene c. carolina*) --Threatened-- is 4½-6 inches long with a high, domelike shell and extremely variable coloration and pattern. Both upper and lower shells may be yellow, orange or olive on black or brown; either dark or light colors may predominate.

Found in woodlands, field edges, thickets, marshes, pastures, bogs and stream banks, the Eastern Box Turtle ranges from southeastern Maine, west to the Mississippi River, central Illinois and south to northern Florida. Most typically found in well-drained forest bottomland, they have been observed swimming in slow-moving streams and ponds. The young are semi-aquatic. This animal is considered rare in Massachusetts due to loss of habitat and mortality while crossing highways.

NORTHERN DIAMONDBACK TERRAPIN (*Malaclemys terrapin*) --Threatened-- is a medium-sized salt marsh turtle with a wedge-shaped back shell that is colored in ash grays, light browns and blacks, and patterned with concentric rings, grooves and stripes. They inhabit marshes, which border salt or brackish tidal waters and can also be found in mud flats, shallow bays and coves. This animal is believed to be declining in Massachusetts.

EASTERN SPADEFOOT TOAD (*Scaphiophus holbrookii holbrookii*) --Threatened-- is characterized by an elongated sickle-shaped "spade" found under each hind foot. Its body is grayish brown, blackish-brown, or sepia with smooth skin. Two yellow lines originate from each eye and run down its back to form a lyre-shaped pattern. Another light line runs along each side of its body. It is found in forested areas with sandy or loose soils and pine and oak woodlands interspersed with temporary ponds, which are used for breeding. It is listed as a rare species in Massachusetts where it is also considered endangered.

SPOTTED TURTLE (*Clemmys guttata*) --Special Concern-- is a small turtle, usually less than five inches in shell length, which is characterized by distinct yellow polka dots on its head, neck and legs. Spotted turtles are pond dwellers, which prefer the colder water temperatures of spring; they disappear in the heat of summer. They lay eggs in nearby open fields and the young hatch in about 12 weeks. Their average life span is 26 years, but many probably achieve 50 years.

### *Birds*

ROSEATE TERN (*Sterna Dougallii*) --Threatened-- nests in colonies on islands, beaches and sand dunes. Endangered in Massachusetts and throughout their range, the Roseate Tern is under consideration for federal listing under the Endangered Species Act (ESA).

ARCTIC TERN (*Paradisaea*) --Special Concern--is endangered in Massachusetts. The Arctic Tern nests colonially in similar habitat to the Roseate Tern.

LAUGHING GULL (*Laurus atricilla*) --Special Concern-- nests colonially on islands, beaches, and sand dunes or in similar habitat to the Arctic and Roseate Terns. The Laughing Gull is increasingly rare in Massachusetts.

RED KNOT (*Calidris canutus*) --Special Concern-- uses sandy beaches with extensive tidal flats and nearby salt marshes during migration stopovers. The Red Knot does not breed in Massachusetts, but the stopover habitat is important in its life cycle.

PIPING PLOVER (*Charadrium melodus*) --Threatened-- nests on sandy beaches and dunes. Numerous programs have been implemented to enhance the populations. Oversand vehicle traffic is a major factor in the destruction of juvenile plovers. Closure of beaches to motor vehicle traffic during times when chicks are scampering along the beach has significantly increased the success rate of fledged young. Other predators such as mammals and other bird species remain a part of the survival formula.

WILLET (*Catotrophyus semipalmatus*) --Special Concern-- nests and feeds on beaches and salt marshes. The Willet is a Species of Special Concern and is rare in Massachusetts.

LEAST TERN (*Sterna antillarum*) --Special Concern-- inhabits broad, flat, open, sandy, pebbly beaches, with sparse vegetation. Nests are usually shallow depressions in the sand, and they occur in colonies. The Least Tern is considered a Species of Special Concern in Massachusetts.

OSPREY (*Pandion haliaetus*) --Special Concern-- requires clear water of ocean, lakes and streams that have close proximity to high perching opportunities. Osprey has enjoyed some success with several nesting sites established around Eastham's marshes. This cooperative effort between Massachusetts Audubon, Massachusetts Division of Fish & Wildlife, the Town and various property owners has resulted in the installation of pole-mounted platforms. Typically, a nesting pair will occupy the site and return yearly to raise two or three young.

## F. Scenic Resources and Unique Environments

### *Scenic Landscapes*

The Massachusetts Landscape Inventory, established by the Department of Environmental Management (DEM) to "identify and locate the Commonwealth's important natural features" includes the salt marshes of Eastham in the Cape Cod National Seashore. These marshes, primarily the Nauset Marsh, are visible from the Fort Hill area, Seashore trails, and the Old Coast Guard Station at Coast Guard Beach.

Although they have not been officially listed as scenic landscapes, the salt marsh systems and tidal flats along Cape Cod Bay provide vistas that are unique on Cape Cod, and perhaps in the Commonwealth. One can almost imagine the Native American dwellings that stood on the ridge above the marshes when Champlain sailed into Cape Cod Bay and had his "first encounter" with the local residents. At low tide, the tidal flats at First Encounter Beach and Kingsbury Beach stretch as far as the eye can see, providing a rare glimpse of the ocean floor and sealife. The salt marsh systems have all been included in two Areas of Critical Environmental Concern: The Inner Cape Cod Bay area the Wellfleet Harbor area on the northern border of Town.

There are several distinctive scenic areas, which can be viewed from Town-owned lands. These include the Lamont Smith and Louise Horton (Cottontail) areas, the Fort Hill area looking out to Town Cove, Coast Guard Beach and Nauset Beach in Orleans as well as to the salt marshes. The Cape Cod Rail Trail provides views of several marsh and pond areas. Other areas are Town Cove at Collins Landing seen from Route 6, Boat Meadow as seen traveling north on Bridge Road, all Town landings and beaches and the Atlantic Ocean and Coast Guard Beach seen traveling south on Ocean View Drive.

The 4,800 acres of Eastham contained within the Cape Cod National Seashore would certainly be considered a unique environment. Residents have consistently rated the Seashore as one of the visually most appealing areas of the Town, and residents use the Park for walking, hiking and bicycling throughout the year. In addition to its visual qualities, the presence of the Seashore guarantees that fully one third of the Town will be preserved as open space and as a habitat for wildlife.

### *Culturally Significant Landscapes and Scenic Roads*

Eastham's cemeteries are significant contributors to the historical character of its cultural landscape. The Cove Burying Ground (1660-1770), also the site of the Town's first church, contains the graves of three Mayflower passengers and many of the first settlers. The Bridge Road Cemetery (1754-1886), also the site of the Town's second church, buried succeeding generations of the original residents. Both cemeteries are listed on the National Register of Historic Places. The Congregational and Soldiers Cemetery was established in 1829 when a new church was built on the King's Highway (now Route 6). The complete name derives from a Civil War Memorial erected on the grounds. A Methodist burial ground and church were established in the early 1800's on the King's Highway and is now the Evergreen Cemetery.

The most popular culturally significant landscape in Eastham is the "Windmill Green" located on Route 6 and Samoset Road. The wind-driven gristmill is the oldest on Cape Cod and a favorite tourist attraction. At its present site since 1808, it is listed on the National Register of Historic Places as a contributing structure to the Eastham Center Historic District.

Eastham is fortunate to have many scenic roads featuring combinations of tree-lined vistas, historic houses, ocean, pond and marsh views. The Eastham Historical Commission has compiled a list of scenic roads that includes: Bridge, Cable, Dyer Prince, Fort Hill, Governor Prence (east of Route 6), Great Pond, Hemenway, Herring Brook, Lawton, Locust, Massasoit, Mill, Nauset and Salt Pond Roads, Ocean View Drive, and Smith Lane.

***Historic Sites and Districts***

Several sites and structures in Eastham are listed in the National Register of Historic Places including those within the boundaries of the Cape Cod National Seashore. They include the Nauset Archaeological District, which has been designated a National Landmark by the Secretary of the Interior. This designation automatically confers National Register status on these sites which include three (3) in the Salt Pond area, two (2) at Fort Hill and one (1) at Coast Guard Beach; Nauset Light, Nauset Light Keeper's House and oil house; Beacon and Twin Sisters of Nauset Lighthouses; and the French Cable Hut.

The Old Town Centre Historic District is a local regulatory district approved by Town Meeting in 1986. The District Commission reviews all exterior buildings alterations, demolitions and new construction. The District consists of twenty-five (25) properties and encompasses the west side of Route 6 in the vicinity of Salt Pond Road, Locust Road to Mill Road, and the east of Route 6 along Nauset Road to Schoolhouse Road. It includes the 1869 Schoolhouse Museum owned by the Eastham Historical Society.

Since approval of the Town's first local comprehensive plan, several Eastham historic sites and districts have been added to the National Register of Historic Places as a result of grants obtained by the Eastham Historical Commission. The Old Town Centre Historic District is now listed in the National Register as well as its previous listing in the State Register.

The Eastham Center Historic District consists of fifty-nine (59) properties along the west side of Route 6, Samoset Road to Bridge Road, and Depot Road to Samoset Road. Notable inclusions are the Windmill, Windmill Green, Public Library, Chapel-in-the Pines (Unitarian-Universalist), 1741 Swift-Daley House owned by the Eastham Historical Society, and the Eastham Town Hall, the only property on the east side of Route 6.

Collins Cottages Historic District, consisting of thirteen (13 properties), is sited on Town Cove at the entrance to Eastham. Cove Burying Ground, Eastham's first cemetery, is on the east side of Route 6 opposite Hay Road. Bridge Road Cemetery, the town's second oldest, is west of Route 6 and south of Samoset Road. Both cemeteries are listed individually in the National Register.

The Fort Hill Rural Historic District encompasses 100 aces of field, forest and salt marsh within the boundaries of the Cape Cod National Seashore. Located east of Route 6, the district includes the Captain Edward Penniman House and Barn, the Sylvanus Knowles House and the Seth Knowles House.

The Massachusetts Historical Commission, in conformance with Federal guidelines, considers any structure at least 50 years old to have potential historic significance. Research conducted by the Eastham Historic Society and the Eastham Historical Commission has identified 221 structures in the Town meeting this definition.

A formal inventory of 100 properties was completed in 1995 and is on file at the Massachusetts Historical Commission. Twenty-eight (28) properties were recommended for nomination to the National Register of Historic Places. The Massachusetts Historical Commission determined sixteen (16) to be eligible for listing. Six have since been listed.

The oldest church building in Eastham is the Chapel-in-the-Pines (Unitarian-Universalist) dating from 1889. It is individually eligible for listing in the National Register and is now listed there as a contributing building in the Eastham Center Historic District. A major financial sponsor of the Chapel's construction was Captain Edward Penniman, whose house and barn at Fort Hill are a National Register property.

## G. Environmental Problems

### *Groundwater, Surface Water and Coastal Water Contamination*

The Cape Cod Aquifer, and thus, the Nauset Aquifer, is replenished primarily from precipitation. On the Cape, there is little surface water runoff. Up to ninety percent (90%) of the annual rainfall and snowfall percolates into the ground. Additional recharge to the aquifer is provided by wastewater discharge from on-site septic systems. This wastewater may still harbor contaminants that endanger drinking water. For this reason, wastewater disposal needs to be carefully managed to control negative impacts. Ponds, streams, and groundwater all flow to larger rivers and marine waters. This interconnection means that all water uses -- drinking, swimming, boating, shell fishing, cranberry farming or wetlands habitat -- depend on the quality of groundwater.

The most common potential contamination source for the on-site domestic water supply wells in Eastham are the on-site sewage disposal systems on the same lot. Furthermore, the small size of the Town, which is long and narrow, magnifies the conflict between the water recharge areas for private wells and potential municipal water supply wells and potential contamination sources. Other significant existing and potential contamination sources are commercial underground fuel storage tanks, most of which are located along Route 6, and on-site domestic underground fuel storage

tanks. An additional significant contamination source is storm water runoff from Route 6. Further possible contamination sources are wastes from large animals kept by residents and fertilizers from the turnip and asparagus farms of fifty years ago.

***Analysis***

It continues to be the policy of the Town that the best strategy to maintain good water quality is to prevent contaminants from reaching critical water supplies rather than to attempt a cleanup of previously degraded areas. The Great Pond watershed zone study has identified the former Town landfill (now a transfer station) and former septage lagoon as potentially significant contributors to degradation of the water quality in that zone. The Town, however, has an extensive monitoring program in place and the site is capped and closed. Water quality on and adjacent to the site has steadily improved. In the report entitled "Groundwater and Gas Monitoring Results for September 2003, Town of Eastham Old Orchard Road Site" prepared by ATP Environmental and submitted to the Department of Environmental Protection, it was concluded that there were no Lower Explosive Limit exceedances at any of the landfill's gas monitoring wells and the data suggests that concentrations of landfill gas in soils off site pose no imminent threat. Also, off site detection of volatile organic compounds (VOCs) was minimal and the data appears to support that concentrations of VOCs pose no imminent threat. While there were VOCs present in several of the wells, all of the concentrations were below Massachusetts Maximum Contaminant Levels. The report also concludes that there is continued evidence of a localized groundwater movement to the northeast.

The entire section of Route 6 through the Town disposes of storm water runoff as point source discharges into either water bodies or artificially created basins. According to the 1996 report, Water Resources of Outer Cape Cod, private wells along the same road have levels of sodium significantly higher than those private wells along both Town and private roads, indicative of more intensive State road salting programs for snow and ice control. In addition to these easily identifiable sites, the effects of other low level activities such as the use of lawn chemicals, fertilizers, the intensification of use of private property through conversion of seasonal use residences to year-round use, and the creation of additional living space on existing dwellings on substandard lot sizes continue to adversely impact water quality.

The Water Resource Advisory Board, in collaboration with the Board of Health, formulated an annual water monitoring program which was approved at the May 2002 Town Meeting and has since begun implementation. Each year one-third of the Town's wells are sampled for nitrate content on a three-year cycle. The program is expected to provide information about the contamination patterns and reveal problem areas that require remediation.

The Board of Health has established regulations to limit and sometimes prohibit an increase in the number of bedrooms for a dwelling, which requires a Title 5 variance of any sort. Further protection could be provided through by-laws or regulations requiring identification of local zones of contribution for new development and nitrate loading overlay districts in densely populated or vulnerable sensitive areas. Zoning measures could include development impact statements as part of site plan review and establishing a District of Critical Planning Concern through Cape Cod Commission regulations. Additionally, the Board of Health encourages sewage disposal systems that utilize alternative and innovative technology to provide more effective treatment of effluent than that provided by existing Title 5 regulations and technology. The Board of Health has required use of alternative systems on several applications for variances.

In 2002, the Board of Selectmen appointed a Wastewater Management Planning Committee and charged the committee with the ultimate goal of developing a comprehensive wastewater management plan to protect the water resources of the Town.

The fresh water ponds serve as a window on our drinking water supply and are at the same time a major focus of recreational activity. Careful monitoring of these resources is imperative to protect against accelerated eutrophication and disruption of the normal processes. Phosphates are regarded as the limiting nutrient factor in fresh water systems, however, diagnostic studies on the Great Pond system (Wagner et al, 1986, and 1991) indicate that while "...primary productivity is largely dependent on phosphorous dynamics, groundwater inputs are not as influential as might be expected. In general, the quality of water in Great Pond is entirely appropriate to its varied uses; alteration through management appears unnecessary at this time."

As impacts on groundwater from resident population growth increases, it can be expected that there will be increased impacts on Eastham's ponds. In the case of Great Pond, several residences have been added since 1986 within the pond watershed. The community cannot afford to become complacent about maintaining high water quality. Therefore, attention should be focused on mitigation of non-point contribution of the groundwater to Eastham's fresh water ponds. Periodic monitoring for nutrients, elimination of the use of phosphate cleaning products, and upgrading of sewage disposal systems within 300 feet of ponds should be considered.

Beginning in 2001, a group of volunteers trained by the Cape Cod Commission through the PALS program (Pond and Lake Stewards) began monitoring ten ponds in town for several parameters including clarity, dissolved oxygen, temperature, and some chemical testing including total nitrogen, total phosphorus and chlorophyll. The goal of the monitoring is to provide a long-term record of pond water quality to be able to assess groundwater quality and the pond eutrophication process. Preliminary results of the monitoring system seem to indicate that all the ponds suffer from at least moderate eutrophication, which although a natural process, is influenced by human activity.

The protection of coastal embayments is a key environmental issue that is directly related to the economic vitality of Eastham. Embayments are where shellfish live and where much of the finfish in the surrounding ocean begin their lives. The land areas surrounding these embayments are some of the most desirable lands for development because of their proximity to the coastal waters. On Cape Cod Bay, the desirability of these lands has caused these areas to be divided into very small lots, each with its own septic system. Each of these septic systems adds contaminants to the groundwater, which is then discharged into the coastal embayments. Non-point source contaminants from septic systems can include metals from plumbing, phosphate from detergents, and nitrogen from toilet wastes, plus other chemicals and contaminants added to toilets by persons unfamiliar or unconcerned with the immediate impact of untreated septage on the surrounding environment.

Among these contaminants, nitrogen is the primary concern for coastal waters. It is usually the nutrient, which limits coastal productivity. Too much nitrogen leads to ecosystem-wide changes as the underlying plant communities are altered. Excessive nitrogen in coastal waters has been implicated as a cause of declining shellfish and finfish productivity, loss of eelgrass beds, and increased algal growth. Coastal ecosystems around Cape Cod are particularly sensitive to excessive nitrogen because the ecosystems have evolved to accommodate small amounts of nitrogen, reflective of the Cape's generally nutrient-poor sandy soils. As human populations have increased on Cape Cod, so have the nitrogen loads from wastewater discharges, fertilized lawns, and road runoff containing animal wastes and volatile organisms from gasoline and associated automotive exhaust products.

In order to ensure that coastal water quality is protected from excessive nutrients, adequate documentation of the sensitivity of each individual embayment to non-point source pollution must be developed and a management plan must be established and implemented. The Towns of Eastham and Orleans participated in a flushing study of Nauset Marsh and Town Cove beginning in 1993, funded through the Cape Cod Commission's Coastal Embayment Project and the National Seashore, to determine their critical nitrogen load. A final report was issued in 1998 with the critical nitrogen loading rate for the two embayments and recommendations for appropriate non-point source strategies. Chief among these recommendations was adopting Board of Health regulations requiring denitrifying septic systems for all new and replacements septic systems within the delineated watershed.

Underground storage of heating oil and gasoline is currently subject to periodic testing and review. This is critical since a failure in any underground storage tank will probably affect downstream domestic water supply wells and a facility, which is located in a sensitive area, will have disastrous consequences. The Town should continue to encourage the removal of underground storage tanks to diminish the potential for groundwater contamination.

### *Solid and Hazardous Waste*

Eastham operates a solid waste transfer station and recycling center at the site of the closed landfill on Old Orchard Road. This facility is used to collect and transfer materials to private processing, recycling and disposal facilities. In October of 2002, the Town approved a new design and reconstruction of the Eastham Recycle Center and Transfer Station. The goal of the new design is to reduce trash generation by increasing recycling over the near and long term future. Through the use of compactors, the cost of transporting recyclables to market will also be reduced.

According to the Eastham Department of Public Works, during calendar year 2003, the Eastham Transfer Station handled 7,204.5 tons of municipal solid waste. The Town recycled 9.3% of the 7,204.5 tons. The most recent figures from the Cape Cod Commission follow:

## Table 5

## Cape & Island Tonnage Information, CY 2001 and 2002

| Eastham | Tons |
|---|---|
| Recycled | 210.29 |
| Landfilled | 1,120.14 |
| Total | 1,330.43 |

Source: Cape Cod Commission

A private company hauls most of Eastham's solid waste in town-owned trailers to a waste-to-energy facility in Rochester, MA. The contract between the town and SEMASS will be in force until January 1, 2008, or, at the option of the town, until January 1, 2015.

The transfer station and recycling center include a scale, gate house, two compactors, a "gift shop" for reusables, a composting area, and drop-off areas for glass, all types of paper, cardboard, magazines, #1 and #2 plastics, tin and aluminum cans, refundable containers, yard waste, ashes, wood, scrap metal, car batteries, tires, and white goods. Eastham's voluntary recycling program became mandatory in May of 2000. Eastham holds annual household hazardous waste (HHW) collections. In 2003, 1,585 gallons of waste were collected from 198 households at a cost of $6,785. Data collected by the Cape Cod Commission indicates that the average cost per household of such events Cape-wide in 2003 was $27, while in Eastham the average cost per household was $29.

Future waste quantities at the transfer station will depend on the increasing trend

toward recycling and home composting, the increase in user fees to encourage waste reduction and the possible adoption of a unit-based pricing strategy (pay-by-bag). The Eastham Board of Health has adopted regulations, which address the management of solid waste and recyclable materials, and transfer station operational standards. The regulations require the separation of compostable and recyclable materials from refuse which goes to SEMASS. The transfer station is financed by the Town's operating budget. Current operating costs are covered by a combination of tax revenues, sticker fees and other user fees.

Eastham is a member of the Tri-Town Septage Treatment Facility, which treats septage waste and is located in the Town of Orleans. The facility generates sludge, grit and screenings, which are hauled to an off-Cape facility. The sludge was composted at the Yarmouth-Dennis Regional Septage Facility until summer 1995 when the composting operation was closed due to equipment problems. If this composting facility is re-opened, the sludge may return to this facility.

# Section V:
# Inventory of Lands of Conservation and Recreation Interest

## A. Protected Parcels

In addition to having one third of its land area under the jurisdiction of the National Seashore, Eastham was a "pioneer" among Cape towns in purchasing open space. As far back as the early 1970's, and well before the establishment of the Cape Cod Land Bank, Eastham residents saw the benefit in acquiring open space to provide wildlife habitat, control development and provide recreational opportunities. Currently, the Town sets aside $75,000 annually in its capital expenditures budget for the purchase of open space. According to the Outer Cape Capacity Study (1996), Eastham's per capita acres of open space at 0.69 is the fourth highest on the Cape, exceeded only by its three Outer Cape neighbors (Wellfleet, Truro and Provincetown). The higher number for the other three towns is largely due to larger land holdings by the Cape Cod National Seashore. By comparison, the average for the remainder of the Cape outside the four Outer Cape towns is 0.20 acres per person.

### *1. Cape Cod National Seashore*

The Cape Cod National Seashore along Eastham's eastern boundary provides a passive and active recreational facility of more than 4,800 acres or close to one-third of the Town. The Seashore is a favorite regional and national destination spot and provides miles of beaches, offering excellent fishing, swimming, boating and kayaking. The upland portion supports nature trails, bicycling, horseback riding and hunting. The park is operated by the National Park Service (U.S. Department of the Interior) and was established by an Act of the U.S. Congress on August 7, 1961. The legislation protects the land by specifying preservation as the primary goal:

> "In order that the Seashore shall be permanently preserved in its present state, no development or plan for the convenience of visitors shall be undertaken which would be incompatible with the preservation of the unique flora and fauna or the physiographic conditions now prevailing or with the preservation of such historic sites and structures."

The legislation does allow the National Park Service to:

> "... provide for the public enjoyment and understanding of unique natural, historic and scientific features of Cape Cod with the Seashore by establishing such trails, observation points, and exhibits and providing such services as may be deemed desirable for such public enjoyment and understanding..."

The Seashore receives approximately five million visitors yearly and virtually all of these visitors pass through the town of Eastham. The Salt Pond Visitor Center in Eastham is

one of the main entrances to the Seashore and other attractions within the Town include Fort Hill, Nauset Lighthouse, Coast Guard Beach, and Doane Rock.

The Seashore has two beautiful sandy beaches in Eastham. The beaches extend from the spit south of Coast Guard Beach to Wellfleet. A total of 825,000 people visit the beaches annually. The Coast Guard maintained a sea rescue station at one location, hence the name of the beach. The Park maintains 55 parking spaces with comfort facilities provided including outside showers for bathers. Additional parking is provided off Doane Road at the Doane Rock and Little Creek areas. Shuttle service is provided to Coast Guard Beach from these parking areas.

Nauset Light Beach is approximately two miles north of Coast Guard Beach. This beach provides 150 parking spaces and receives 700,000 visitors each year. A comfort station and showers are provided. Park rangers patrol the Seashore throughout the year. They also provide guided tours to many of the Seashore's attractions and historic sites. There is also the Salt Pond Visitors Center with many on-going activities scheduled year-round.

### 2. *Town-owned Open Space*

Eastham has over five hundred (500) acres of Town-owned open space holdings, some of which are also historic areas. These areas provide a rich variety of outdoor experiences and scenic vistas to both residents and visitors.

Table 6
Town-owned Open Space
(Outside the Cape Cod National Seashore)

| Name | Location | Acreage |
|---|---|---|
| South Eastham Conservation Area (SECA) | Peach Orchard Way | 24.0 |
| Upper Boat Meadow | Smith Lane | 19.2 |
| Cottontail Acres (Horton) | Samoset Road | 18.0 |
| Boat Meadow | off Bridge Road | 168.5 |
| Deacon Paine Road | Deacon Paine Road | 0.7 |
| Minister Pond | Schoolhouse Road | 5.0 |
| Herring River | off Herring Brook Road | 13.5 |
| North Sunken Meadow | N. Sunken Meadow Rd. | 12.4 |
| Nickerson Parcel | Cole Road West | 26.6 |
| Outer Beach | Map #30 D 5 | 2.0 |
| Rock Harbor | Dyer Prince Road | 10.0 |
| Salt Marsh | Map #67 E 2 | 2.5 |
| Sunken Meadow | Map #65 B 2 | 2.0 |

| Name | Location | Acreage |
|---|---|---|
| Sunset Avenue | Map #28 G 2 | 5.5 |
| Town Forest | Map #33 C 4 & C 5 | 128.0 |
| Eastham Windmill | Samoset Road | 1.6 |
| Roach Property | Harvest Road | 63.6 |
| Walters Property | State Highway (Rt. 6) | 7.9 |
| Meservey Property | Samoset Road | 1.3 |
| Gutzler Property | John Thomas Road | 5.6 |
| Wentworth Property | off Charlie Noble Way | 9.0 |
| Fitzgerald Property | Map #16 005 | 1.8 |
| White Property* | Bridge Road | 8.3 |
| Hatch Property* | Hatch's Way | 1.4 |
| Mumford Property* | Clark's Point | 1.3 |
| Total Town-owned Open Space: | | 539.7 |

Source: Assessor's Office and Eastham Open Space Committee

**Note: parcel acquired by vote of May 2004 Annual Town Meeting; transfer of deed pending*

### 3. *Eastham Conservation Foundation*

The table below lists the land holdings of the Eastham Conservation Foundation, which include forty-five (45) parcels ranging in size from under one acre to more than thirty acres. The Eastham Conservation Foundation is a private nonprofit group unaffiliated in any official way with the Town. To date, the Eastham Conservation Foundation has acquired over two hundred and fourteen (214) acres, of which almost seventy-five percent is designated wetlands.

Table 7
**Land Holdings of**
**The Eastham Conservation Foundation**

| Location | Natural Habitat | Acreage |
|---|---|---|
| off Samoset Road | salt marsh (Herring River) | 21.21 |
| 21 Dyer Prince Road | salt marsh (Rock Harbor) | 1.15 |
| 195 Spring Road | salt marsh (Sunken Meadow) | .80 |
| Seventh Avenue | eroded bluff | .67 |
| 565 Herring Brook Road | bank, salt marsh | .73 |
| off Herring Brook Road | salt marsh (Herring River) | 15.21 |
| off Ireland Way | brackish marsh (Boat Meadow) | 9.49 |
| 160 Locust Road | shrub swamp | .77 |
| 41 Cranberry Lane | beach, dune | 1.03 |

| Location | Natural Habitat | Acreage |
|---|---|---|
| 42 Salt Marsh Lane | brackish marsh (Boat Meadow) | 25.95 |
| 35 Hoffman Lane | locust grove | 1.24 |
| Old County Road | pine/oak woods | 3.09 |
| off Nauset Road | pine/oak woods | 3.49 |
| 227 Dyer Prince Road | salt marsh (Rock Harbor) | .70 |
| Governor Prence Road | maple swamp | 19.85 |
| 40 Piper Lane | pine/oak woods | .28 |
| 45 Piper Lane | pine/oak woods | .32 |
| off South Eastham St | pine woods/marsh | 5.40 |
| off Herring Brook Road | salt marsh (Herring River) | 34.25 |
| 10 Windjammer Lane | shrub swamp | .51 |
| 170 Mill Road | pine/oak woods | .46 |
| 1885 Route 6 | locust grove | 1.24 |
| off Nauset Road | pine/oak woods | 3.79 |
| 30 Moore Lane | shrub swamp | 1.13 |
| 25 Moore Lane | pine/oak woods | .99 |
| off Nauset Road | pine/oak woods | 7.43 |
| 26 Asparagus Lane | dune/beach | 1.34 |
| 35 Asparagus Lane | dune | 1.08 |
| 1565 Samoset Road | salt marsh (First Encounter) | 2.54 |
| 10 Nauset Way | cedar field | .35 |
| off Nauset Road | pine/oak woods | 1.91 |
| 750 Bridge Road | salt Marsh (Boat Meadow) | 1.79 |
| N. Sunken Meadow Road | salt marsh | 26.66 |
| 180 Pine Woods Road | shrub swamp | .62 |
| off Bridge Road | salt marsh (Boat Meadow) | 2.71 |
| 270 Dyer Prince Road | shrub thicket/swamp (Rock Harbor) | 1.01 |
| 330 Dyer Prince Road | shrub thicket (Rock Harbor) | .42 |
| 55 Kingswood Drive | pondshore/swamp | .67 |
| 45 Pilot Road | pondshore/swamp | .71 |
| 475 Herring Brook Road | salt marsh/bank (Herring River) | 1.30 |
| 44RR Salt Marsh Way | coastal heath/salt marsh (Boat Meadow) | 6.85 |
| 30 Duck Marsh Way | vernal pool/swamp | .75 |
| 75 Goody Hallett Drive | (youth hostel) | 2.42 |
| off Goody Hallett Drive | salt marsh/locust grove | 7.20 |
| off Route 6 | maple swamp | 1.84 |
| | Total Land Holdings: | 223.35 |

Source: The Compact of Cape Cod Conservation Trusts

### 4. *Land Protected by Conservation Restrictions*

Eastham has adopted guidelines, which set forth conservation restriction procedures for the Town. Conservation restrictions place limits on the future development use of a parcel of land requiring maintenance of the parcel in a natural or open condition for a specific period of time. The title remains with the owner and public access is not necessarily provided. An organization, such as the Eastham Conservation Foundation or Massachusetts Audubon Society, generally holds the restriction, but the Conservation Commission may also hold the restriction. The Town's guidelines note "studies have indicated that restricted land generates a substantial net savings to the Town when compared with costs associated with development." It adds, "for this reason, every effort should be made to promote conservation restrictions in the town." Land of any size may be placed under conservation restriction and such restrictions generally carry an 85% tax abatement (95% if public access is permitted). The following parcels are subject to a conservation restriction in the town.

## Table 8

## Land Protected by Conservation Restrictions

| Map | Parcel | Location | Acreage |
|---|---|---|---|
| 8 | 295 | 125 McKoy Road | .74 |
| 11 | 359 | 95R McKoy Road | 2.00 |
| 13 | 79 | 1200 Herring Brook Road | 1.01 |
| 17 | 687C | off Herring Brook Road | 18.03 |
| 19 | 38-40, 42, 48 | 200 Sunset Avenue | 4.53 |
| 11 | 61 | 380 Locust Road | 3.32 |
| 13 | 74B | 1205 Herring Brook Road | 6.50 |
| 12 | 300 | 575R Nauset Road | 6.50 |
| 1 | 74 | 10 Ben's Way | 5.40 |
| 4 | 457 | 405 Higgins Road | 8.09 |
| 17 | 687E | 44 Salt Marsh Way | 6.85 |
| 17 | 687G | 28 Salt Marsh Way | 11.16 |
| 11 | 061A | 375 Locust Rd. | 3.32 |
| 13 | 079B | 1180 Herring Brook Rd. | 1.00 |
| 16 | 021 | 10 Cartway North | 20.30 |
| 25 | 021A | Nauset Rd. | 1.80 |
| 25 | 021B | Nauset Rd. | 9.50 |
| 25 | 021D | Nauset Rd. | 1.37 |
| 25 | 021F | Nauset Rd. | 5.08 |
| Total Conservation Restricted Acreage: | | | 116.5 |

Source: The Compact of Cape Cod Conservation Trusts

*Other Critical Open Lands:*

### 5. *PREFERENTIALLY-TAXED LANDS*

There are three state programs, known as "preferential assessments", that provide for reduced property taxes for landowners. These are Chapter 61, the Forestland Act; Chapter 61A, the Farmland Assessment Act; and Chapter 61B, the Open Space Act. A landowner participating in one of these programs commits a property to agriculture, forest or recreation for a specific period of time. In exchange, the Town reduces taxes and is granted the right to purchase the property if and when it is removed from the Chapter 61 classification for conversion to residential, commercial or industrial use. Under these programs, the reduction in taxes is generally 75-95%. A landowner must pay penalties if the land is removed from the program.

Lands in this program should not be considered protected open space. The Town has 120 days to purchase property in one of these programs under the right of first refusal provision and must match a bona fide purchase price. The town's option can also be assigned to a nonprofit organization such as the Trust for Public Land. However, in many cases towns do not have the financial ability to purchase these lands within that time frame unless they have planned ahead for such acquisitions. Land Bank funds and the Town's land acquisition program should be a great asset for this purpose.

Table 9
Land Subject to Preferential Taxation

| Program | Owner/Location | Acreage |
|---|---|---|
| Chapter 61 | Fellers/255 Higgins Rd. | 35.40 |
| Chapter 61A | G. Handel/1765 Massasoit Rd. | 11.69 |
| Chapter 61B | Atlantic Oaks Rt./Rt. 6 (Campground) | 17.10 |
| Chapter 61B | C. Baldwin/Dyer Prince Rd. | 22.66 |
| Chapter 61B | T. Marion/1200 Herring Bk. Rd. | 7.35 |
| | Total Acreage Subject to Preferential Taxation : | 94.20 |

Source: Eastham Assessors Records

### 6. *PONDS*

There are twelve (12) ponds in Eastham: Molls, Minister, Great, Long, Jemima, Muddy, Herring, Depot, Widow Harding, Bridge, Baker's, and Deborah's. These ponds, which are surface expressions of groundwater, have good water quality, and provide swimming and boating opportunities. Many of these ponds are privately owned. In addition to these ponds, four additional surface water bodies exist. These include Salt Pond Bay, Nauset Bay, Herring River, and Boat Meadow River.

**Table 10**
**Eastham's Largest Ponds**

| | |
|---|---|
| Great Pond | 109 acres |
| Herring Pond (Coles Pond) | 43 acres |
| Long Pond (Depot Pond) | 25 acres |
| Minister Pond (Meetinghouse Pond, Eastham Center Pond) | 21 acres |
| Salt Pond | 20 acres |
| Muddy Pond (Little Muddy Pond, Mill Pond) | 11 acres |
| Bridge Pond | 10 acres |
| Widow Harding Pond | 9 acres |
| Jemima Pond | 6 acres |
| Total Area: | 254 acres |

Source: Natural Resources Dept.

## 7. *Landings and Beaches*

Public access to water in Eastham is provided via eight (8) Town landings and eleven (11) Town beaches. The beach and landing area total over one hundred and seven (107) acres, as shown on table on the table below. These beaches provide recreational opportunities including swimming, fishing, boating, surfing and walking.

**Table 11**
**Town-owned Landings and Beaches**

| Name | Location | Acreage |
|---|---|---|
| Boat Meadow Landing | Bay View Drive | 8.3 |
| Collins Landing | Route 6 | 0.1 |
| Great Pond Landing and Beach | Great Pond Road | 1.0 |
| Minister Pond Landing and Beach | Schoolhouse Road | 1.0 |
| Salt Pond Landing | Route 6 | 6.4 |
| Hemenway Landing | Hemenway Road | 1.3 |
| Jemima Pond Landing | Samoset Road | 0.7 |
| Herring Pond Landing and Beach | Herring Brook Road | 0.9 |
| Campground Beach | Campground Road | 2.2 |
| Cooks Brook Beach | Steele Road | 4.3 |
| Sunken Meadow Beach | So. Sunken Meadow Rd | 1.0 |
| Thumpertown Beach | Thumpertown Rd | 1.0 |
| Cole Road Beach | Cole Road | 1.0 |
| First Encounter Beach | Samoset Road | 34.0 |
| Wiley Park | Herring Brook Road | 44.0 |
| Kingsbury Beach | Kingsbury Beach Road | 0.3 |
| Rock Harbor Landing | Dyer Prince Road | 9.9 |
| Total Town-Owned Landings and Beaches: | | 107.5 |

Source: Eastham Open Space Committee

## B. Unprotected Land

In accordance with the mandate from its citizens, and the resulting land use policy, it is anticipated that all Town-owned parcels will remain undeveloped. Two parcels, however, are worth mentioning. The first is a 5.3-acre parcel that is currently leased to the Nauset Rod and Gun Club. Located within the Seashore, this parcel is unlikely to be developed because it lacks appropriate access, and current zoning regulations require three acres to construct a single-family home within the Park. Any new construction would also be subject to CCNS regulations and design guidelines.

The second Town-owned parcel that might seem ripe for development at some future date is the Eastham Elementary School. The school grounds are comprised of 11.4 acres. Due to an increasing student population, there has been discussion of the need to build a larger school, and an 18-acre parcel has been set aside for that purpose in the area of Nauset Road and Forest Avenue. If that were to happen, however, it is more likely that the existing building would be adapted for reuse as a community center or for some other municipal use. The Nauset Regional High School is located on a 15-acre Town-owned campus within the Seashore. The school's student population has increased steadily, and the need for the facility extends far into the future. It is unlikely, therefore, that the parcel would ever be used for residential development.

Of greater concern are large privately owned parcels. A survey of the Town assessor's records in 1999 produced a list of 136 privately owned parcels of one acre and larger. As a result of that survey, twelve properties were identified as desirable for purchase and as being consistent with the seven criteria developed by the Open Space Committee to guide the Town's land acquisition program. Owners of some other parcels meeting the general criteria referenced above have indicated a willingness to consider sale of the parcels to the Town at some future date, and the town continues to maintain contact with these owners.

# Section VI: Community Goals

## A. Open Space Plan Process

The Eastham Open Space and Recreation Plan represents the fourth in a series of management plans which have been developed by and for the citizens of the Town of Eastham beginning in 1971. At that time, the fledgling Cape Cod National Seashore had begun its work of protecting and managing large areas of the Outer Cape, and Eastham residents saw the need to follow suit in other areas of the Town. With the purchase of Wiley Park in the early 1970's, the citizens set a course to protect and maintain open space for the enjoyment of all and to provide special habitats for the native species of plants and animals (who clearly were the first residents of the "Narrow Land"). The 1971 plan was updated and revised in 1986. The third update of the plan, in 1999-2000, was a complete rewrite of the plan. The primary focus of each of the updates is to ensure the enrichment of our Town by the preservation of open space and recreation land. It is also a chronicle of the success of the previous efforts and maps a strategy for the future.

This plan is the result of careful investigation, updating and revision by members of the Open Space Committee of the Town of Eastham, appointed by the Board of Selectmen. Committee members adopted various sections of the previous plan and researched specific issues or updated details for discussion at open meetings. Other committees were invited to provide input to the process and contributed specific details. Goals and objectives were formulated and adopted after discussion among the members of the Committee, Board of Selectmen and other interested parties.

Also, the Open Space Committee relied on several other management and land use plans as sources for ideas, inventories and statistics. The Outer Cape Capacity Study, Water Resources of Outer Cape Cod, the Cape Cod Commission Regional Policy Plan and the Eastham Local Comprehensive Plan provided a wealth of information on various topics that are interrelated with open space and recreation. Finally, the Open Space Committee received assistance and guidance from Town staff, especially Natural Resources Officer Henry Lind, Recreation Director Mark Powers and Town Planner Terry Whelan.

The Eastham Vision Workshop and Survey, completed in 2000, provided confirmation of many of our goals and objectives, In 2001, the Open Space Committee conducted a survey of the users of our Open Space area which provided valuable insight as to how our parklands are used. It also formed the basis for many of the criteria contained in our new Managed Lands Plan.

Eastham has a great diversity of open space and recreation opportunities as demonstrated in the inventory above. At the same time, the Town has a very active retired population. The survey conducted by Eastham's Comprehensive Planning Committee shows that the amount and frequency of use of open space and recreation

facilities by Eastham residents does not really decrease until after age 80.

Following are specific goals, which the Committee determined should guide the Town's open space acquisition and preservation programs.

## B. Open Space and Recreation Goals

***Goal 1: In order to preserve and enhance the availability of open space in Eastham and provide wildlife habitat, recreation opportunities, and protect the natural resources, scenery, groundwater quality, air quality and community character of Eastham and in order to manage population growth and congestion, Eastham shall protect 50% of its remaining developable land, as of 1996, as open space.***

As evidenced by their commitment early on to acquiring and preserving land, their willingness to make cash purchases using Proposition 2½ exclusions and by their overwhelming support for the Cape Cod Land Bank, the citizens of Eastham place a high priority on open space preservation. At the Community Vision Workshop of 2000, citizens said that any land that becomes available should be purchased by the Town. The revenue from the Land Bank, along with the $75,000 set aside annually as part of the Town's capital improvements budget, has gone a long way toward purchasing new land and maintaining the parcels the Town already owns. A Self Help grant was a help in the major 19.2-acre Upper Boatmeadow (Aschettino) purchase. The Land Bank funds have become increasingly important, as land prices have risen dramatically in the last five years. In addition, funding from the Open Space Bond Bill over the years has been used to help purchase 43.2 acres of open space. The lack of funding of this bill by the legislature in 2004 may have an impact on our purchases. Additional funds for acquisitions of Cape Cod Pathways trail linkages may come from DEM trail grants, land trust purchases, or negotiation of easements.

In addition, the Town should consider making greater use of cluster zoning to provide open space within residential subdivisions. Assessors' data indicates that there are only five parcels greater than 10 acres within the town. There are approximately twelve parcels between 5 and 10 acres. Expanding the use of the cluster by-law to parcels that are a minimum of 5 acres in size would allow for greater use of this by-law provision, and at the same time allow for design that accomplishes open space protection.

***Goal 2: To preserve and enhance opportunities for passive and active recreation in the natural environment to meet the needs of all Eastham residents and visitors by making access to facilities and resources universal.***

The number of children participating in Eastham's recreation programs continues to increase as programs expanded under the guidance of a new Recreation Director. The Town provides activities year-round utilizing facilities at the elementary and high school, the playing fields behind the Town Hall and at Wiley Park. A new Basketball League

has been particularly successful, and lighting on the basketball court has allowed play at night. Recent initiatives to use the redeveloped Willy's Gym are providing new opportunities for indoor recreation and swimming programs.

In 1999, the Town received a grant from the Department of Housing and Community Development for barrier removal at the Wiley Park bathhouse and swimming beach. With community and state funds, the bathhouse was rebuilt, new ramps to the beach were installed, and the playground was completely reconstructed and enhanced. Great Pond beach is also accessible for fresh water swimming. Two salt water beaches, Coast Guard on the ocean side and First Encounter on the Bay side, are also accessible. New ramps have been installed and a special wheelchair has been purchased for beach use wherever it is needed. A second purchase is planned. P.A.C.E. has done an outstanding job of cataloguing accessible facilities and encouraging voluntary compliance. The result is that seventy percent (70%) of the retail stores, medical offices, churches, motels and other public accommodations in Town are accessible. In addition, all Town buildings and a significant portion of the Town's recreation areas provide universal access. The Committee takes very seriously its role as a supporter and assistant to businesses and the Town to make facilities accessible to all.

The construction of a bridge over Route 6 in Orleans has led to significantly improved access and higher numbers of bikers on our bikeways. At the same time, the rejuvenation of the Bikeways Committee in 2001 has led to improved bikeways signage, resided awareness of bikeways issues, and new goals for the group. There are opportunities for the Bikeways Committee and the Open Space Committee to tackle some of these issues together. As an alternative mode of transportation, biking should be a high priority issue.

***Goal 3: To maintain the overall quality and quantity of Eastham's groundwater, to ensure a sustainable supply of high quality untreated drinking water and to preserve and improve the ecological integrity of marine and fresh surface waters.***

This may be the most important goal included in this plan, because without it, the Town would not be what it was or is now. There is also an interconnectedness between the groundwater quality and the quality of water in the fresh water ponds and wetlands, marshes, coastal embayments and estuaries and coastal waters. Ponds, streams and groundwater all flow to larger rivers and marine waters. This interconnection means that all water uses -- drinking, swimming, boating, shellfishing, cranberry farming or wetlands habitat -- depend on the quality of the groundwater.

***Goal 4: To encourage the use of public and private sewage treatment facilities in appropriate areas where they will provide environmental or other public benefits and where they can be adequately managed and maintained.***

This goal is closely related to Goal 3 because the greatest single threat to groundwater quality in Eastham is septic disposal systems. Small lots make it often impossible to achieve a one hundred foot separation between the well and septic system on a property. In addition to polluted wells, many ponds, estuaries and marshes are at risk of becoming polluted by increased nutrients from wastewater discharges.

Conflicts between preserving high quality drinking water and land use activities from a growing year-round population are becoming more complex and difficult to resolve. The Town must develop a comprehensive strategy that involves the Board of Health, Zoning Board of Appeals, Planning Board, Water Resources Committee and Conservation Commission.

The Town should also consider adopting Board of Health Regulations in designated nitrogen sensitive areas under Title 5 regulations. Adoption of these regulations could go a long way toward precluding the rush to grandfather developments or to improve existing properties under the old regulations and standards.

***Goal 5: To protect the public interests in the coast and rights for fishing, fowling, and navigation; to preserve and manage coastal areas so as to safeguard and perpetuate their biological, economic and aesthetic values, and to preserve and where appropriate expand public access to the shoreline.***

Proximity to the water is listed by residents as one of the best things about living in Eastham. However, the public's right to access the water must be carefully balanced with the need to protect water quality and plant and animal habitat. Residents are fortunate to have a number of Town-owned properties and areas under the Cape Cod National Seashore that provide access for recreation, hunting and fishing. The Town should develop a comprehensive plan for the future use of these areas along with increasing its open space holdings. The Town should continue to foster its good relationship with the Seashore, and work cooperatively to provide the best possible opportunities and protection for areas within the Park.

Perceiving a need for a specific beach facility for Town residents, a group of advocates has formed a committee to explore establishment of a beach/parking lot with facilities south of Nauset Light Beach on Town-owned land. The committee's proposal is structured to relieve the Town of any financial obligation. The proposal received strong support by resolution at the May 2002 Annual Town Meeting. It must now address regulatory and environmental issues in appearances before appropriate Town and county boards and/or commissions.

***Goal 6: To limit development in high hazard areas in order to minimize the loss of life and structures and the environmental damage resulting from storms, natural disasters and sea level rise.***

The Town already adopted Flood Plain Zoning as part of its Zoning By-law. The by-law establishes a flood plain overlay district for seven purposes:

1. Ensure public safety through reducing the threats to life and personal injury.
2. Eliminate new hazards to emergency response officials.
3. Prevent the occurrence of public emergencies resulting from water quality, contamination, and pollution due to flooding.
4. Avoid the loss of utility services, which if damaged by flooding would disrupt or shut down the utility network and impact regions of the community beyond the site of flooding.
5. Eliminate costs associated with the response and cleanup of flooding conditions.
6. Reduce damage to public and private property resulting from flooding waters.
7. Facilitate accurate insurance ratings and promote the awareness of flood insurance.

A. In addition, all development in the district including structural and non-structural activities whether permitted by right or by special permit must be in compliance with the following:

- 780 CMR 3107.0, of the Massachusetts Building Code, which addresses floodplain and coastal high hazard areas.
- 310 CMR 10.0, Wetlands Protection Regulations, Department of Environmental Protection (DEP).
- 302 CMR 6.00, Inland Wetlands Restriction, DEP
- 302 CMR 4.00, Coastal Wetlands Restriction, DEP
- 310 CMR 15, Title 5, Minimum Requirements for the Subsurface Disposal of Sanitary Sewage, DEP

***Goal 7: To maintain and improve coastal water quality to allow shellfishing and/or swimming in all coastal waters as appropriate, and to protect coastal ecosystems which support shellfish and finfish habitat.***

Surface water and groundwater contamination pose a great risk to local ecosystems. On-site wastewater disposal system effluent can negatively influence a delicate ecological balance. For example, an estuary's health and viability depend on good water quality. Estuaries comprise extensive portions of Eastham's important coastal habitat. When on-site wastewater disposal systems add excessive nitrate, the ecological balance of the estuary is upset. Marsh grasses and eelgrass cannot take up all of the nitrate.

The excess nitrate then causes algae to bloom in abnormally large quantities. The resulting profusion of floating and attached algae reduces the amount of sunlight available to eelgrass and the amount of oxygen available to marine organisms. Without eelgrass, the food web can no longer be supported. Without the stabilizing influence of the eelgrass root system, sediments can become suspended. This creates cloudy waters and siltation, sealing the fate of the formerly healthy coastal embayment. The suspended sediment may cause problems elsewhere as waves and currents transport it to other areas. A similar process takes place in freshwater ponds, but phosphorous from on-site sewage disposal systems drives the decline of these systems rather than nitrogen.

This is only one example of threats to coastal water quality and coastal ecosystems. The Town must develop a comprehensive plan to protect these areas that involves the Board of Health, Conservation Commission, Natural Resources Department and Cape Cod National Seashore.

***Goal 8: To preserve and restore the quality and quantity of inland and coastal wetlands in Eastham.***

In addition to on-site sewage disposal, development and the associated filling of wetlands, direct stormwater discharge into wetlands and inappropriate recreational use or over use are the greatest threats to coastal and inland wetlands. The Conservation Commission and the Wetlands Protection Act are excellent tools for protecting and restoring these fragile areas. The Wetlands Protection Act gives tremendous power to local Conservation Commissions to review and control any construction or other activity within 100 feet of the wetland. Serious fines may be levied against violators and restoration can be required when damage occurs due to work done without proper permits or work done in a careless manner. The Eastham Conservation Commission takes its stewardship very seriously, but their stewardship can be enhanced by closer coordination and support from the Board of Health and Planning Board. They must remain ever vigilant, and these areas should be continually monitored to ensure that they remain viable.

***Goal 9: To prevent loss or degradation of critical wildlife and plant habitat, to minimize the impact of new development on wildlife and plant habitat, and to maintain existing populations and species diversity.***

The best way to achieve this goal can be summed up in two words, "open space". The single greatest threat to wildlife and plant habitat is that the habitat to support biodiversity is disappearing. With a doubling of the year-round population over the past 25 years, Cape Cod has seen enormous tracts of land given over to residential development. As a result, wildlife and plant habitat has disappeared at an alarming rate. This rampant development has crowded out the species that are native and resulted in ever increasing numbers of threatened and endangered animals and plants. Migration territoriality is an important aspect of the life cycle of these creatures and

plants. The best way to promote migration is to establish a series of greenbelt corridors that allow for natural movement. The best way to establish these corridors is to connect open space. Therefore, the Town should seek to acquire key parcels that will allow the development of continuous wildlife corridors to take place in order to provide and preserve critical wildlife habitat and plant habitat. Two recent acquisitions, Upper Boat Meadow and the Meservey trail that connects two existing open space areas, were both important in meeting this goal.

***Goal 10: To develop and implement an ongoing land acquisition program.***

The Land Bank has given each town on the Cape an opportunity to develop a logical and sound approach to land acquisition supported by a ready source of funds. Eastham's Board of Selectmen, acting as a land acquisition committee and using criteria developed by the Open Space Committee, reviewed over 100 properties identified by staff. Approximately 25 properties were rated highly desirable and owners were contacted about the possibility of selling to the Town.

In 2002, the Board of Selectmen decided to give the Open Space Committee the responsibility for making recommendations to the Board of Selectmen on the purchase of land for open space, conservation and recreation. The Committee uses the Open Space Plan criteria to evaluate conservation and recreation land.

The six criteria listed below were developed by the Open Space Committee to guide open space and recreation land purchases. While not all six of the criteria need to be identified with each parcel in consideration, they define the general parameters and suggested importance of attributes, which should be considered.

Properties that:

- Protect water quality; contribute to well-field protection; provide accessory equipment sites for a potential water supply distribution system.
- Access the Chapter 61 tax abatement program: agricultural, forest, open space and recreation.
- Provide links to the Cape Cod Pathways and Bikeways network; Cape-wide Greenbelt program where criteria are met for wildlife habitat.
- Abut town conservation lands.
- Abut a body of water/marsh.
- Provide a potential town park, recreation or beach site.

Acquiring open space lands is always a happy confluence of the right property becoming available for purchase at the right time. Currently, there are several larger waterfront parcels that are high priority parcels for the Town, but these are not for sale. There are also a number of smaller parcels that would make good "pocket parks" or small playing fields. The Open Space Committee recommends that the Town remain aggressive in seeking out owners and properties, which are desired.

# Section VII: Analysis of Needs

## A. Summary of Resource Protection Needs

***Groundwater Protection Plan***

Groundwater is the thread that links together all of Eastham's natural resources. The relationship between groundwater and other resources has been explored extensively elsewhere in this plan. The need is for a comprehensive approach to conserve and protect it. Periodic testing of individual wells does not address the overall quality or quantity of water. Individual well drilling permits do not address the effect that drawdown of the aquifer has on ponds, wetlands and embayments. The need is for a broader approach that puts individual users in the context of the entire Town and its future.

The Groundwater Protection Plan should include:

- development of an overlay district of "environmentally sensitive areas" where controls are more stringent than in other areas
- analysis of the effect drawdown of the aquifer is having on natural resources and the Town's ability to sustain itself
- establishment of a program for regular Town-wide testing of private wells
- establishment of Town-wide water restrictions and development and implementation of a conservation program
- recommendations for areas of Town that need special water restrictions
- recommendations for areas of Town that need a public water supply
- analysis of the best use of existing resources to ensure that there will be enough high quality drinking water for the Town's future
- a framework for promoting cooperation between Federal, State and Town regulatory agencies to achieve the above goals

***On-site Wastewater Management Plan***

As with groundwater, there is currently not a comprehensive or overall approach to wastewater disposal. With no Town sewer system, individual property owners have individual plans prepared, individual systems installed and maintained with no real measurement of the impact these individual systems have together. The only properties that receive special scrutiny are those located adjacent to ponds, wetlands or the coasts. Even in these sensitive areas, once a system is approved, there is no protocol for monitoring the impact it has on the resource. Because of its development pattern, it would be highly unlikely that Eastham will ever be entirely sewered. Wastewater will most likely continue to be disposed of on-site in most cases, and the impact this will have on groundwater and other resources is not being sufficiently measured or monitored. In addition, no program for educating homeowners about alternative systems exists.

The Wastewater Management Plan should include:

- analysis of the effect on-site wastewater disposal is having on groundwater, other natural resources and the Town's ability to sustain itself
- continuation of the program for regular Town-wide testing of individual disposal systems
- recommendations for areas of Town that require special disposal systems due to high density or proximity to sensitive resource areas
- recommendations for areas of Town that would benefit from a Town sewage disposal system or a series of "package treatment plants" with an analysis of the potential cost
- analysis of the best use of existing resources to ensure that there will be enough high quality drinking water for the Town's future
- a framework for promoting cooperation between Federal, State and Town regulatory agencies

## Growth Management

### *Residential Growth*

Unlike many other Towns on the Cape with large amounts of undeveloped, large tracts of land, growth management for Eastham will primarily involve controlling the extension and expansion of existing residential structures as residentially used land makes up the largest proportion of developed land at almost 39% of the Town's total area (LCP, 2002). In spite of the diminishing amount of raw land available for new residential development, Eastham is still growing. As evidenced in the 2000 census, the overall year-round population has increased over 22% between 1990 and 2000 (4,462 vs. 5,453). In this same ten-year period, the proportion of seasonal housing units to total housing units has decreased from 56% to 52%, corresponding with the year-round population growth (US Census, 2000).

The trend of second home owners retiring in Town and requesting permission to upgrade their summer homes by increasing - often doubling - existing square footage or habitable space is persisting. This ongoing transition toward larger, more year-round population is pressuring all of the Town's regulatory boards as they wrestle with the effects of "mansionization" and the overall increasing intensity of residential land use in Eastham.

Eastham is certainly not alone in facing this problem. Other communities have developed controls such as floor area to lot area ratios and lot coverage restrictions. In 2001, the Town adopted a Residential Site Plan Approval By-law to increase oversight of residential development meeting certain thresholds based upon existing and proposed Site Coverage (area under roofed permanent structures) in relation to total lot area. The primary intent of the by-law is "to encourage construction that is

reasonably sensitive to scale, size and massing of buildings...," protect adjoining property owners and the needs of the Town. Residential projects meeting the review thresholds are evaluated by the Planning Board prior to issuance of a Building Permit for the following: preservation of landscape, relationship with terrain, harmony with prevailing character of the neighborhood, avoidance of sensitive site features, protection of groundwater/-surface water quality, and vehicle/pedestrian safety.

However, part of the difficulty in Eastham is that there is only beginning to be a unified approach to the problem by the different regulatory boards. The Zoning Board of Appeals is reluctant to turn an applicant down on the basis of zoning when the Board of Health and Conservation Commission have already approved the project.

The Board of Health in allowing these increases in use may grant up to eight or ten variances from Title 5 regulations. However, the statutory options for denial limit the Board's decision making. There has been little communication between the boards on this subject, but the barriers are being broken down and the channels improved with staff support. The Board of Selectmen as the appointing authority needs to also take an active role in supporting and encouraging and perhaps even requiring board education. Due to high land values, legal actions against the Town in the form of appeals of board decisions are increasing. This has resulted in greater regulatory conflict because the boards are reluctant to be the cause of additional legal costs to the Town.

Therefore, Growth Management should address the following:

- Create zoning and health regulations that limit an owner's ability to extend or expand a dwelling that is pre-existing nonconforming in lot area
- Make a determination of the carrying capacity of the area between Herring Brook Road and the Bay where most of the undersized lots are located to quantify the amount of development that can safely occur
- Develop a plan for coordination among regulatory boards for reviewing applications for construction, expansion or reconstruction of pre-existing nonconforming dwellings on undersize lots
- Provide a "rational nexus" to support development limits in this area and other measures that can be taken to ensure that water and other natural resources are protected

While redevelopment of existing residential properties will significantly shape the future character of Eastham, approximately 350 acres of residentially developable land still exists in Town (LCP, 2000). Recent and projected land division activity before the Planning Board creating new building lots has been and is projected to consist of mostly small scale subdivisions, typically less than five (5) lots, and new lot re-combinations created by Approval Not Required (ANR) plans.

One important tool available to the Town is to declare this area a District of Critical

Planning Concern through the Cape Cod Commission. This would suspend local permitting and freeze development in the area until the regulatory boards have a chance to work out a coordinated approach to the problem and develop regulations and policies for dealing with applications to expand existing properties. Ordinary repairs such as roof or window replacement would be permitted, but new construction and the expansion or extension of existing structures would be frozen until the new regulations are in place.

***Commercial/Industrial Growth***

As of 2002, there were approximately 29 acres of commercial land and 25 acres of industrial land available for development. If all the land is used, there could be eleven and one-half (11.5) acres or about five hundred thousand (500,000) square feet of gross floor area of commercial development and seven and one-half (7.5) acres or about three hundred and twenty-seven thousand (327,000) square feet of gross floor area of industrial development at "build-out" under current zoning regulations (LCP, 2002).

During the past few years, the Business Roundtable, a subcommittee of the Association to Preserve Cape Cod (APCC), has focused its efforts on managing growth on Cape Cod into the new century. As part of its efforts to reduce "sprawl" the Roundtable is a proponent of clearly delineating growth or activity centers to focus growth where it can contribute to the vibrancy of a local center. They have initiated a regional "Town Center" planning effort and are encouraging all Cape towns to explore increasing density in commercial centers that results in a development pattern that is pedestrian/transit oriented, includes mixed uses and affordable housing, is sensitive to the environment and is supported by appropriate infrastructure. An integral component of this concept is that any allowances for increased density in Town Centers must be offset by preservation of open space in other areas. The Town's Critical Planning Committee is currently exploring application of this concept for the Route 6/Brackett Road area.

## B. Summary of Community's Needs

***Community Center***

Many of Eastham's residents would like to see the Town build or buy an existing facility to be used as a community center. One of the reasons for having such a facility would be to provide more year-round recreational activities and coordination of all activities under one roof. At Annual Town Meeting 2000, a group of citizens proposed buying the Norseman Athletic Club (now redeveloped as Willy's Gym) in North Eastham for such a use. This proposal was defeated, but the interest in having the Town operate some kind of facility for these services remains strong.

### *More Activities for Children and Teens*

A survey conducted in May of 2000 found that among younger citizens, there was a need for more recreational activities for younger children and teens. While most agreed that the Recreation Department does an outstanding job with the programs it currently runs, there was a need for more variety and additional facilities such as playgrounds and ball fields. Another suggestion was to better utilize the gymnasiums at the elementary and high school by having them open during off hours for children and teens to use. This would require supervision by either Town staff or parents. Since then, many new active and passive activities for these age groups have been implemented, and in 2002 lights were added to the Field of Dreams basketball court, enhancing the appeal and usage of the court. Among the new activities are cheerleading, ski trips, jump rope, and trips off-Cape. The Recreation and Beach department now works in conjunction with Willy's Gym in regard to expanding the High School recreation Basketball League and expanding other activities for the citizens of Eastham. The department works collectively with neighboring towns to assist in the development and maintenance of Finch Skateboard Park in Orleans.

### *Indoor Swimming Pool*

A need was also identified for an indoor swimming pool. Whether as part of a community center or an independent facility, the pool would serve swimmers of all ages. It could be used for training by the High School swim team, and could support programs for younger children and elders. The pool could be open at certain times for unstructured swimming for recreation and exercise. The Recreation Department or a private contractor could operate the pool.

### *Pathways Project*

Eastham will play an important role in the Cape Cod Pathways project, which is a regional effort to create a Cape-wide interconnected network of walking trails. The Barnstable County Commissioners/Cape Cod Commission are coordinating this project with assistance from several other agencies and organizations. The Eastham Board of Selectmen has endorsed this project. The County and the Town will be working together over the next few years to identify trail routes, identify acquisition needs and dedicate trail segments. The first priority within the Town of Eastham is to identify a north-south "spine" for the trail. Lateral trail segments will also be planned. Biking/hiking connectors from the existing Cape Cod Rail Trail to the bay and ocean sides would provide for increased recreational activities.

### *Bikeways*

The addition of a new bridge over Route 6 that connects Orleans and Eastham has improved safety considerably for that area of the bikepath, and at the same time increased the number of riders coming through Eastham. Safety issues are a concern

along the existing bike paths. Painted crossings on major roads, signage for motorists and cyclists, lighting where appropriate, emergency telephones and courses on bicycle safety should be provided. A Hiking/Bikeways Committee could recommend mitigating measures for potential problems and additional bicycle routes. In addition to connectors, parking facilities and comfort stations must be provided for these routes.

Several biking/hiking trails, which would link to existing Cape Cod Rail Trail and the National Seashore Bike Trail and allow for additional non-motorized access to the bay and ocean sides have been proposed; one of these proposed trails would take advantage of the Cape Cod Regional Technical High School parking facilities in Harwich.

Proposed Bike Routes in Eastham

- a route from Nauset Regional High School to Nauset Beach and Coast Guard Beach;
- a route from the National Seashore Visitor Center to the bay beaches;
- a route from where the existing trail intersects with Brackett Road to the North Eastham Post Office shopping area in an effort to eliminate bike traffic on Brackett Road.

## Section VIII: Goals and Policies

The Cape Cod Commission, through its Regional Policy Plan for Barnstable County, has established overall planning goals and minimum performance standards for open space and recreation. Eastham's goals and performance standards are consistent with the Regional Policy Plan. The following are from the Eastham Local Comprehensive Plan, approved in 2003.

### OPEN SPACE AND RECREATION

**Goal 1: To preserve and enhance the availability of open space on Cape Cod and provide wildlife habitat, recreation opportunities, and protect the natural resources, scenery, groundwater quality, air quality, and character of Cape Cod, Barnstable County shall strive to protect as open space at least 50% of the developable land remaining as of 1996.**

Policy 1: Development or redevelopment within significant Natural Resource Areas, as illustrated on the Cape Cod Significant Natural Resource Area Map dated January 10, 2002, as amended, shall be clustered away from sensitive resources and maintain a continuous corridor to preserve interior wildlife habitat. Where a property straddles the boundary of an area shown on this map, development shall be clustered outside the boundary. The primary function of these areas is the provision of groundwater recharge, wildlife habitat, open space, scenic roadways, appropriate recreational opportunities and protection of the Cape's natural character.

Policy 2: Preserved open space within proposed developments shall be designed to be contiguous and interconnecting with adjacent open space, and shall be subject to permanent conservation restrictions. Eastham may develop bonus provisions through their local by-laws to allow increased density for preservation of additional high quality open space. Additional guidance on dedication of open space for Developments of Regional Impact can be found in the Guidelines for Calculation and Provision of Open Space in Developments of Regional Impact, Technical Bulletin 94-001, as amended.

Policy 3: Residential, commercial, and industrial development qualifying as a Development of Regional Impact shall provide permanently restricted upland open space in accordance with the proportional calculation*. Where appropriate, credit may be obtained for set aside of off-site open space or a contribution of funds may be made to the town, state, land trust, or the Compact of Cape Cod Conservation Trusts' Land Fund for open space acquisition at a per-point rate to be specified in the Guidelines for Calculation and Provision of Open Space in Developments of Regional Impact, Technical Bulletin 94-001, as amended. Off-site open space shall be provided in the town where development is proposed, unless the Commission finds, in consultation with the relevant towns, that the provision of off-site open space in an adjacent community on Cape Cod is appropriate.

Open space shall be designed to protect those portions of the site with the highest natural resource values as identified by a natural resources inventory. Within open space areas, the maximum amount of natural vegetation shall be maintained. No credit may be obtained for land that is set aside as open space on a residential lot on which a dwelling exists or may be built unless the lot is at least three acres in size. Where development consists of more than one type or is located in more than one area, open space totals shall be determined for each area and added together. No credit may be obtained for areas that have been dedicated as open space prior to the date of application. Where new development is proposed within Significant Natural Resource Areas, open space shall be provided within these areas. The requirements for Significant Natural Resource Areas shall apply to any certified Growth/Active Centers or Growth Incentive Zones that are located within a Significant Natural Resource Area, with exceptions as noted in Policy 7. For the purpose of calculating the open space requirements, the development area for a project is any upland area affected by "development" as defined in the definitions section of the Regional Policy Plan, 2002, and as specified in Technical Bulletin, 94-001, as amended.

**For Proportional Calculation of Site Area for new development see Regional Policy Plan 2002, p 66.*

Policy 4: Residential, commercial, and industrial redevelopment that qualifies as a Development of Regional Impact shall meet the open space requirements of Policy 3, except where the proportion of existing development to open space on the development parcel is less than that which is required, in which case the existing proportion shall be maintained. Redevelopment projects in Significant Natural Resource Areas shall provide no less than a 2:1 development to open space proportion either as on-site open space or an equivalent cash or off-site contribution, regardless of existing proportions, with exceptions as noted in Policy 7.

Policy 5: In the design of developments, significant natural and fragile areas including critical wildlife and plant habitat; water resources such as lakes, rivers, aquifers, shore lands, and wetlands; historic, cultural, and archaeological areas; significant scenic roads and views; "unfragmented" forest (as mapped by the Cape Cod Commission); and significant landforms shall be protected.

Policy 6: Where development is proposed adjacent to land held for conservation and preservation purposes, the development shall be configured so as to prevent adverse impacts to these lands and in a manner that maximizes contiguous open space.

Policy 7: Notwithstanding Significant Natural Resource Area designation, where development is proposed in Growth Incentive Zones, the open space requirement shall be reduced to the proportion required for Growth Incentive Zones where a natural resources inventory demonstrates that there are no wetlands, surface water bodies, vernal pools, estimated rare species habitat, agricultural soils, priority natural communities, critical upland areas, public water supply Wellhead Protection Areas, or other unique or fragile habitat within 100 feet of the site boundary.

Policy 8: As an incentive toward reducing the generation of impervious areas, protecting open space, and maintaining or improving community character, projects meeting parking requirements under proposed buildings or as a multi-storied parking garage may reduce their open space requirement by an amount equivalent to one half the area of each floor of garaged parking provided. Open space credit may not be obtained for parking spaces provided in excess of the minimum number of spaces required by local zoning.

**Goal 2: To preserve and enhance opportunities for passive and active recreation in the natural environment to meet the needs of both residents and visitors.**

Policy 1: Recreational needs as identified in the 2000 Statewide Comprehensive Outdoor Recreation Plan, Local Comprehensive Plan, and open space plan should be addressed in the development of projects. Such needs include opportunities for wildlife study, expansion of trail corridors, protection of scenic roadways, development and expansion of access for the disabled, additional public beaches, and water-based recreational opportunities with associated parking facilities to the extent these minimize alteration of natural shorelines and do not harm wildlife habitat.

Policy 2: New development should provide suitable recreation and play areas to meet the needs of the residents of that development such as ball fields, playgrounds, basketball courts, or bicycle and walking paths.

## WATER RESOURCES

**Goal 3: To maintain the overall quality and quantity of Eastham's groundwater to ensure sustainable supply of untreated high-quality drinking water and to preserve and restore the ecological integrity of marine and fresh surface waters.**

Classification System and Minimum Performance Standards: The Regional Policy Plan establishes a water resources classification system to manage and protect Cape Cod's water resources. The water resources classification system recognizes four primary water resource areas and their respective recharge areas: Wellhead Protection Areas, Fresh Water Recharge Areas, Marine Water Recharge Areas, and Potential Water Supply Areas. The classification system also recognizes areas where water quality may have been impaired from existing development or where water quality is unusually pristine. Where these areas overlap with any of the resource areas above, improvement or preservation of water quality is a major goal.

Policy 1: Except as otherwise specified in the classification system below, all development and redevelopment shall not exceed a 5-ppm nitrogen loading standard for impact on groundwater based on the methodology contained in Cape Cod

Commission Nitrogen Loading Technical Bulletin 91-001.

Policy 2: All development and redevelopment shall comply with the Minimum Performance Standards outlined in the following water resources classification system. If a property is located where two classifications overlap, the more stringent standards shall apply. The water resources classification system is illustrated on the Cape Cod Water Resources Classification Maps I and II, dated January 10, 2002, in the Regional Policy Plan, as amended and described below:

**A. Wellhead Protection Areas:** Consist of areas that contribute groundwater to existing public and community water supply wells. These areas shall be delineated by a consistent method and recognized by the Commission in conjunction with state standards for Zone IIs (as defined in 310 CMR 22.02).

1. The maximum loading standard for nitrogen impact on groundwater shall be 5 ppm for development and redevelopment unless a cumulative impact analysis indicates a more stringent loading standard is necessary.
2. Development and redevelopment that involves the use, treatment, generation, storage, or disposal of hazardous wastes or hazardous materials, with the exception of household quantities, shall not be permitted.
3. Public and private sewage or treatment facilities with Title 5 design flows greater than 10,000 gallons per day shall not be permitted in these areas, except as provided in subsection E.2 below and subject to Minimum Performance Standards 2.2.1 through 2.2.5.
4. Uses prohibited in Zones II by state regulations shall not be permitted in these areas.
5. Development and redevelopment shall adopt a turf and landscape management plan that incorporates water conservation measures and minimizes the amount of pesticides and chemical fertilizers through best management practices.

**B. Fresh Water Recharge Areas**: Consist of recharge areas to freshwater ponds as mapped by a standard hydrogeologic assessment or other method acceptable to the Commission.

1. In order to limit phosphorus inputs, no subsurface disposal systems shall be permitted within 300 feet of maximum high water of freshwater ponds, as determined by the high groundwater adjustment methodology in the Commission's Technical Bulletin 92-001, unless the applicant demonstrates by a groundwater study that groundwater from the site does not discharge into the pond or a tributary.
2. Development and redevelopment may be required to delineate the groundwater recharge areas to potentially affected freshwater ponds and

conduct a phosphorous loading assessment in order to identify and mitigate the project's adverse impacts. For ponds where pond management strategies have not been developed or implemented, DRIs may be required to make a monetary contribution toward the development or implementation of appropriate assessment work or management strategies.

3. Public and private sewage treatment facilities may be used within Fresh Water Recharge Areas subject to subsection E.2 and Policies 1-5 below.

**Marine Water Recharge Areas:** Consist of recharge areas to marine embayments as mapped by the Commission, on Cape Cod Water Resources Classification Map II dated January 10, 2002, as amended:

1. In watersheds where the critical nitrogen load has been determined, development and redevelopment shall not exceed the identified critical nitrogen-loading standard for impact on marine ecosystems. In watersheds where the critical nitrogen load has not been determined, development and redevelopment shall be required to make a monetary contribution to determine the flushing rate of the embayment in order to calculate the critical nitrogen-loading rate. DRIs may be required to make a monetary contribution toward the development or implementation of appropriate nitrogen management strategies.
2. In watersheds where existing watershed development exceeds identified critical loading standards or where there are documented marine water quality problems in the associated embayment, including, but not limited to, those embayments shown on the Cape Cod Water Resources Classification Map II, development and redevelopment shall maintain or improve existing levels of nitrogen loading. This may be achieved by providing wastewater treatment for the development or redevelopment and additional treatment capacity for nearby land uses, installation of alternative denitrifying technologies for existing septic systems in the recharge area, and/or an equivalent contribution towards a municipal or watershed effort that achieves the intent of a "no net increase" policy.
3. In watersheds with Commission-approved watershed nutrient management plans, nitrogen loading from development and redevelopment shall attain the nitrogen loading limit specified by the plan, but in no case shall nitrogen loading exceed 5 ppm.
4. Public and private sewage treatment facilities may be used within Marine Water Recharge Areas subject to subsection E.2 and Policies .2.1-5 below.

**D. Impaired Areas:** Consist of areas where groundwater may have been degraded by point and non-point sources of pollution, including but not limited to areas with un-sewered residential developments where lots, on average, are less than 20,000 square

feet; landfills, septage, and wastewater treatment plant discharge sites; and high-density commercial and industrial areas and those down-gradient areas where the groundwater may have been degraded by these sources. For the purpose of these standards, all certified Growth/Activity Centers and Growth Incentive Zones shall be classified as Impaired Areas.

1. Development and redevelopment shall generally meet a 5-ppm nitrogen loading standard for impact on groundwater, but the standard may be increased where it can be demonstrated to the Permitting Authority and the Commission that such increase will cause no adverse impact on ponds, wetlands, marine waters, public or private drinking water supply wells, and potential public water supply areas as identified in Section F below.

**E. Water Quality Improvement Areas:** Consist of Impaired Areas that are located within Wellhead Protection Areas, Fresh Water Recharge Areas, and Marine Water Recharge Areas. In such areas, improvement of water quality is a major goal.

1. Development and redevelopment shall not exceed the nitrogen loading standards for Wellhead Protection Areas or an identified marine water quality standard as applicable. Where existing development within the watershed exceeds the identified loading standard or where there are documented marine water quality problems, there shall be, at a minimum, no net addition of nitrogen loading from development and redevelopment.
2. Use of public and private sewage treatment facilities shall be as follows: within Water Quality Improvement Areas that are in Wellhead Protection Areas public and private sewage treatment facilities may be used to remediate existing problems; within Water Quality Improvement Areas that are in Fresh Water and/or Marine Water Recharge Areas, public and private sewage treatment facilities may be used in conjunction with any development or redevelopment. Sewage treatment facilities and their collection and discharge areas shall maintain the hydrologic balance of the aquifer and demonstrate that there are no negative ecological impacts to surface waters. All such facilities shall be subject to Policies 2.2.1 through 2.2.5 below.
3. Development and redevelopment in Growth/Activity Centers and Growth Incentive Zones within Water Quality Improvement Areas which have been identified as requiring comprehensive wastewater treatment solutions may be required to provide a monetary contribution towards community wastewater facility planning or implementation efforts.

**F. Potential Public Water Supply Areas:** Consist of areas which have been identified by the Commission on the Cape Cod Water Resources Classification Map I dated January 10, 2002, as amended, and future well sites and their associated recharge

areas which have been identified by towns, water districts, or private water companies. Potential Public Water Supply Areas may be removed from consideration provided that supporting information demonstrates to the Commission demonstrating that they will not be considered as potential water supply areas

1. No development shall be permitted within 400 feet of an identified future well site.
2. The maximum nitrogen-loading standard for Potential Public Water Supply Areas shall be 1 ppm for development.
3. Within an identified Potential Public Water Supply Area, the same standards A.2 to A.5 apply as in Wellhead Protection Areas above.

Policy 3: Development and redevelopment shall identify their proposed wells and existing private wells on abutting properties within 400 feet and assess the impact of the development on the water quality of these wells and all other existing wells that may potentially be affected by the proposed development. Septic systems and other sources of contamination shall be sited to avoid contamination of existing or proposed wells.

Policy 4: Conversion from seasonal to year-round uses in FEMA flood A-zones or within 100 feet of wetlands shall demonstrate that the project will not have adverse impacts on groundwater or adjacent surface waters and wetlands.

Policy 5: Developments of Regional Impact which withdraw more than 20,000 gallons of water per day shall demonstrate through a groundwater study that the project will not have adverse impacts on groundwater levels or adjacent surface waters and wetlands. The study shall include mapping of surface water morphology and comparison of existing and affected water-table fluctuations.

Other Development Review Policies

Policy 6: Water withdrawals and wastewater discharges should be managed so that they do not adversely affect surface water resources, wetlands, private wells, or the safe yield of the aquifer.

Policy 7: Development and redevelopment should use water-conservation technologies or other strategies to obtain a 40% reduction of water use.

Policy 8: Development and redevelopment should utilize alternatives to synthetic chemical fertilizers and pesticides in favor of organic and biological methods.

Policy 9: Development and redevelopment should increase aggregation and improve the level of treatment of existing wastewater flows.

Policy 10: Development and redevelopment should attain greater groundwater or surface water protection than provided for in the Minimum Performance Standards.

Policy 11: Development and redevelopment should attain zero discharge of wastewater through non-water-based waste treatment technologies or reuse of wastewater for irrigation.

Policy 12: Development and redevelopment should submit Chapter 21E site assessments or other water quality information indicating the condition of the site relative to hazardous waste.

Policy 13: Development in USGS-identified Potential Water Supply Areas should be avoided.

Policy 14: Development and redevelopment in Water Quality Improvement Areas subject to Marine Water Recharge Areas should seek to reduce nitrogen loading by providing for the removal of 2 kilograms of nitrogen for each kilogram added.

Policy 15: The development of public or community water supply systems should be encouraged for areas serviced by private wells in Impaired Areas.

**Goal 4: To encourage the use of public and private sewage treatment facilities in appropriate areas where they will provide environmental or other public benefits and where they can be adequately managed and maintained.**

Minimum Performance Standards

Policy 1: Private treatment facilities may be constructed only if there are no feasible public treatment facility options available within three years of the proposed date of construction of a project.

Policy 2: All public and private sewage treatment facilities shall be designed to achieve tertiary treatment with denitrification that meets a maximum 5-ppm total nitrogen discharge standard either through advanced treatment to achieve 5 ppm in the effluent or 5 ppm in groundwater at the down-gradient property boundary.

Policy 3: The construction of private sewage treatment facilities (PSTFs) shall not allow development to occur at a higher density than would be allowed by local zoning.

Policy 4: The construction of PSTFs shall be consistent with municipal capital facilities plans where they exist. Municipalities shall have the opportunity to assume ownership and maintenance responsibilities for such facilities where desired by the municipality.

Policy 5: PSTFs shall not be constructed in FEMA V-zones and floodways, Areas of Critical Environmental Concern (ACECs), wetlands and buffer areas, barrier beaches, coastal dunes, or critical wildlife habitats. PSTFs may be constructed in FEMA A-zones only to remediate water quality problems from existing development within such A-zones and consistent with Minimum Performance Standards 2.2.2 and 2.2.6, except as provided in Minimum Performance Standard 2.2.11.

Policy 6: The long-term ownership, operation, maintenance and replacement of PSTFs shall be secured as a condition of approval in accordance with Commission, state, and local guidelines.

Policy 7: Applications for approval of public and private sewage treatment facilities shall include a plan for sludge disposal.

Other Development Review Policies

Policy 8: When allowing additional development in areas where existing high-density development or large numbers of failing septic systems have led to public health or water quality problems, the Commission and/or Eastham may require PSTFs or DEP-approved alternative systems with enhanced nitrogen removal to be installed as a remedial measure.

**Goal 4.1: To protect the overall water quality of the aquifer and its resources by providing adequate storm water management and treatment.**

Policy 1: New direct discharge of untreated storm water, parking-lot runoff, and/or wastewater into marine and fresh surface water and natural wetlands shall not be permitted.

Policy 2: Storm water shall be managed and infiltrated on site to minimize runoff and maximize water quality treatment. Storm water treatment designs shall be based upon a 25-year 24-hour storm and attain 80% total suspended solids removal and at a minimum be consistent with Massachusetts Storm water Policy Guidelines.

Policy 3: Development and redevelopment shall use best management practices such as vegetated swales and non-structured wetland detention basins for treatment prior to infiltration. Non-structured wetland detention basins and vegetated swales may be counted as open space within Wellhead Protection Areas.

Policy 4: Structured detention basins, infiltration basins and galleries may be used in Growth Incentive Zones provided that Minimum Performance Standards for storm water are met.

Policy 5: Infiltration basins or other storm water leaching structures shall maintain a

two-foot separation between maximum high water table and point of infiltration.

Policy 6: Development and redevelopment shall submit a storm water maintenance and operation plan for approval by the Commission. The plan shall, at a minimum, include a schedule for inspection, monitoring, and maintenance and shall identify the party responsible for plan implementation.

Policy 7: In Wellhead Protection Areas, storm water systems for land uses, which have a high risk of contaminating groundwater, such as vehicle maintenance areas and loading docks, shall install mechanical shut-off valve or other flow-arresting device between the catch basin or other storm water-capture structure draining this area and the leaching structures.

The Town's main concern continues to be to maintain an adequate supply of drinking water and preserve its currently good quality for the foreseeable future. Steps that will help to ensure this outcome are:

1. Enforcement by the Board of Health and other responsible Town bodies, of bylaws and regulations designed to minimize the potential for water contamination. Given the demonstrated relationship between water quality and development density, particular caution must be exercised in the evaluation of requests for variances where increased use of a property is a factor.
2. Reduction of the use of chemicals such as fertilizers and pesticides that inevitably contaminate groundwater.
3. Active encouragement of water conservation.
4. Education and the dissemination of information about water protection will sensitize the public to the importance of water quality and what can be done to preserve it.
5. Monitoring, on a systematic and regular basis, the quality of Eastham's well water. Knowledge of contaminant levels and their evolution over time can identify areas of concern and guide remedial interventions.

## COASTAL RESOURCES

**Goal 5: To protect public and traditional maritime interests in the coast and rights for fishing, fowling, and navigation; to preserve and manage coastal areas so as to safeguard and perpetuate their biological, economic, historic, maritime, and aesthetic values, and to preserve, enhance, and when appropriate, expand public access to the shoreline.**

Minimum Performance Standards

Policy 1: Development and redevelopment along the coastline shall not interfere with

existing public access and traditional public rights of way to an environmentally appropriate use of the shoreline.

Policy 2: Public access shall be provided at all publicly funded beach-nourishment sites where such access will not impair natural resources.

Other Development Review Policies

Policy 3: Marine infrastructure that supports fisheries or marine transportation should be preserved and protected from conversion to private or recreational uses.

Policy 4: Development and redevelopment should reflect the traditional maritime character and/or architecture typical of the area and should be designed to maintain and enhance views of the shoreline from public ways, waterways, access points, and existing development.

Policy 5: The construction of walkways, where environmentally acceptable, should be encouraged to enhance shoreline access for the public, including people with disabilities. Such activities should not degrade undisturbed resources or contribute to adverse impacts to habitat, aesthetics, or storm damage prevention.

Policy 6: If an existing water-dependent facility is within 250 feet of the mean high water line or shoreward of the first public way, whichever is less, such use should not be changed to a non-water dependent facility unless an overriding public benefit is provided to accommodate for the loss of the water-dependent use.

Policy 7: Development or redevelopment of water-dependent facilities should provide coastal access benefits to the general public. Such access should minimize interference with the water-dependent use.

**Goal 6: To limit development in high hazard areas in order to minimize the loss of life and structures and the environmental damage resulting from storms, natural disasters and sea level rise.**

Minimum Performance Standards

Policy 1: Except as specified in Policy 5 (below), no development or redevelopment shall be permitted within Federal Emergency Management Agency (FEMA) V flood zones. Existing structures may be reconstructed or renovated provided there is no increase in floor space or intensity of use. As an exception, where there is no feasible alternative, water-dependent structures and uses may be permitted subject to the approval of all permitting authorities.

It is understood that in the context of this standard, the word structure represents such

items as houses, cottages, garages, sheds, and the like, but is not inclusive of walkways, ramps, piers, and other similar structures. The management of such structures shall be through the standards applied by the Eastham Conservation Commission under the Wetland Protection By-Law for such structures as are located within boundaries of Areas of Critical Environmental Concern.

Policy 2: In order to accommodate possible sea level rise and increased storm intensity, ensure human health and safety, and protect the integrity of coastal landforms and natural resources, all new buildings, including replacements, within FEMA A and V flood zones shall be designed one vertical foot above existing FEMA base flood elevation and state building code construction standards. An equivalent amount of flood storage capacity for new structures is moot in light of Policy 1. Volumetric calculation for displacement of ramps or piers shall be made and an equivalent volume of upland area shall be excavated in the immediate vicinity of the site at a grade not lower than the average surrounding elevation.

Policy 3: Except as specified in Policy 5 (below), no development or redevelopment shall be permitted on barrier beaches and coastal dunes as defined by the Wetlands Protection Act and associated regulations and policies. Existing structures may be reconstructed or renovated provided there is no increase in floor area or intensity of use. Water-dependent public recreational facilities in these locations may be developed providing that it can be demonstrated that the proposed development will not compromise the integrity of coastal resources.

Policy 4: Development and redevelopment on or within one hundred (100) feet landward of a coastal bank or dune shall be designed to have no adverse effect on the height, stability, or the use of the bank or dune as a natural sediment source. In areas where banks or dunes are eroding, the setback for all new buildings and septic systems to the top of the coastal bank or dune crest shall be at least thirty (30) times the average annual erosion rate of the bank or dune. This rate shall be determined by averaging the erosion over the previous thirty (30) year period at a minimum. In instances where shoreline erosion rates are indicative of bank/dune erosion rates, Massachusetts Coastal Zone Management (MCZM), shoreline change maps may be used in determining the setback.

Policy 5: Where fire, storm, or similar disaster has caused damage to or loss of buildings in FEMA A and V zones, on barrier beaches, coastal banks or coastal dunes of greater than 50 percent of their tax assessment valuation, all reconstruction shall be in compliance with current applicable regulations and shall be designed in accordance with these Goals and Policies. Any reconstruction shall not enlarge or expand the use of an existing structure.

Policy 6: No new public infrastructure or expansion of existing infrastructure shall be made in flood hazard zones (FEMA A and V zones) unless it is shown that there is an

overriding public benefit provided, and that such infrastructure will not promote new growth and development in flood hazard areas.

**Goal 7: To maintain and improve coastal water quality to allow shellfishing and/or swimming in all coastal waters as appropriate, and to protect coastal eco-systems which support shellfish and finfish habitat.**

Minimum Performance Standards

Policy 1: New mounded septic systems shall be prohibited within FEMA V-zones except to upgrade existing failed systems where such systems pose a demonstrated threat to public health, water quality, or natural resources. Structural components of failed systems shall be removed from V-zones, unless such removal would cause irreversible adverse impacts to protected resources.

Policy 2: No new direct, untreated stormwater discharges shall be permitted into any coastal waters or wetlands, including discharges above or below the mean high water level. Existing stormwater discharges shall be corrected through treatment and redirection in accordance with applicable Minimum Performance Standards under Goal 4.

Policy 3: The design and construction of stormwater management systems proposed in V-zones shall incorporate the historic rate of relative sea-level rise in Massachusetts of two feet per 100 years to the maximum extent practicable. For systems proposed in A-zones, the historic rate of relative sea-level rise in Massachusetts of one foot per 100 years shall be incorporated into National Pollution Discharge Elimination System Phase II Plans (where required) and individual project design and construction.

Policy 4: In order to avoid additive losses of shellfish habitat and minimize cumulative impacts on wetlands and public access, construction of community docks and piers, rather than separate structures serving individual lots, shall be required. In significant shellfish habitat areas as identified by the Division of Marine Fisheries and/or local shellfish officials, the construction or expansion of docks and piers shall not be permitted. Previously licensed private docks and piers more than 50% damaged or destroyed by storms may be replaced in accordance with federal, state and local regulations, except in areas identified and documented as significant shellfish habitat.

Policy 5: New marinas of ten (10) or more slips, moorings, or active landward storage berths, and expansions of existing marinas by ten (10) or more slips, moorings, or berths shall provide or contribute to the provision of adequate boat sewage pump-out facilities in each harbor and shall provide restrooms for their patrons. Such marinas shall also provide or contribute to provision of adequate collection facilities for solid waste and waste oil for their patrons.

Policy 6: Improvement dredging shall be prohibited except for when new dredging is necessary to accomplish substantial benefit and no feasible alternative exists. Public benefits may include enhancement of fish or shellfish habitat, improvements to the flushing capacity of nitrogen sensitive embayments.

Policy 7: Development shall have no significant direct or indirect adverse effects to eelgrass beds, unless there is no feasible alternative location or design for the project and the project is necessary to accomplish a public benefit.

Policy 8: Development and redevelopment shall be designed and constructed to minimize direct and secondary impacts to fish, shellfish, and crustaceans.

Policy 9: All projects proposed as maintenance dredging shall provide prior permitting authorities, permit numbers, dates of issuance and re-issuance, and documentation that clearly demonstrated the width, depth, and length of the previously permitted project.

Policy 10: Coastal aquaculture facilities shall be designed to have no significant adverse impacts to water quality or to the chemical composition and habitat value of marine sediment.

Policy 11: Undisturbed buffer areas of at least 100 feet in width surrounding coastal wetlands and/or landward of the mean high water mark of coastal water bodies shall be protected in accordance with MPS 2.3.1.2.

Other Development Review Policies

Policy 12: Where appropriate, waterfront facilities should be upgraded to ensure that best management practices are used to avoid adverse impacts to water quality.

Policy 13: Development and redevelopment in the marine environment should be designed to minimize subsurface noise impacts to fish and to protected species habitat.

Policy 14: Encourage the continuation of small-scale aquaculture licenses, as well as the use of native species and good monitoring programs done cooperatively with the National Seashore to prevent negative water quality and ecological impacts from aquaculture activities.

Policy 15: Protect and enhance the quality and quantity of shellfish resources through habitat restoration and aquacultural techniques including the Eastham Aquaculture Technology Training Center at Hemenway Landing.

Overall, the Town must consider the protection of its coastal resources as vital to the

well being of the community. The health and well being of these resources has deteriorated in general due to miscellaneous individual actions, but the net result has been degradation. The status quo is not acceptable in terms of the environmental consequences, and efforts should be maintained to improve the quality of these areas. Additional goals for the Town with regard to coastal resources include the following:

- Protect natural habitats in the coastal region from destruction by coastal-engineered structures.
- Preserve traditional rights of access to shoreline areas by the public.
- Manage the marine habitat of the salt marshes to prevent destruction of shellfish and finfish resources by strictly limiting the construction and utilization of new private docks and piers.
- Plan and implement programs to maintain waterways access for the public, e.g., boat launching areas.
- Protect and improve water quality in shellfish growing areas through better stormwater management and addressing other human utilization of the near shore area.
- Maintain and improve public beaches for the use of bathers.

## WETLANDS

**Goal 8: To preserve and restore the quality and quantity of inland and coastal wetlands in Eastham.**

Minimum Performance Standards

Policy 1: Wetland alteration shall not be permitted except as provided herein and in Policy 3 (below). As an exception, where there is no feasible alternative, water-dependent projects involving wetland alteration and appropriate mitigation may be permitted subject to the approval of all permitting authorities.

Policy 2: Vegetated, undisturbed buffer areas of at least one-hundred (100) feet width shall be maintained and/or provided from the edge of coastal and inland wetlands including isolated wetlands, to protect their natural functions. This policy shall not be construed to preclude pedestrian access paths, vista pruning, or construction and maintenance of water-dependent structures within the buffer area, any of which may be permitted at the discretion of permitting authorities where there is no feasible alternative to their location.

The Eastham Conservation Commission shall require a larger buffer area where necessary to protect sensitive areas or where site conditions such as slopes or soils suggest that a larger buffer area is necessary to prevent any adverse impact to wetlands and associated wildlife habitat. Where a buffer area is already altered such that the required buffer cannot be provided without removal of structures and/or

pavement, this requirement may be modified by the permitting authority, provided it makes the following findings: (1) that the proposed alteration will not increase adverse impacts on that specific portion of the buffer area or associated wetland, and (2) that there is no technically feasible construction alternative.

Policy 3: Disturbance of wetlands and buffer areas for operation and maintenance of underground and overhead utility lines (electrical, sewer, water, communication, and gas lines) may occur. Installation of new utility lines through these areas may occur where the permitting authority finds that the proposed route is the best environmental alternative for locating such facilities. In all instances, disturbance of wetland and buffer areas shall be minimized and surface vegetation, topography and water flow shall be restored substantially to the original condition.

Policy 4: Stormwater management plans for new development shall preclude direct discharge of untreated stormwater into natural wetlands and water bodies. New stormwater discharges shall be located a minimum of 100 feet from wetlands and water bodies.

Other Development Review Policies

Policy 5: Measures to restore altered or degraded inland and coastal wetlands, including nonstructural bank stabilization, revegetation, and restoration of tidal flushing should be encouraged; however, such areas should not be used as mitigation for wetland alteration projects (mitigation banking).

Policy 6: Construction of artificial wetlands for stormwater and wastewater management may be permitted in appropriate areas where there will be no adverse impact on natural wetlands, waterways, and groundwater.

Policy 7: For agricultural areas in wetlands and buffer areas, management practices that would improve water quality and conserve water as recommended by the National Resources Conservation Service should be encouraged.

## WILDLIFE AND PLANT HABITAT

**Goal 9: To prevent loss or degradation of critical wildlife and plant habitat, to minimize the impact of new development on wildlife and plant habitat, and to maintain existing populations and species diversity.**

Minimum Performance Standards

Policy 1: Developments shall be planned to minimize impacts to wildlife and plant habitat. Natural resources inventories shall be prepared in accordance with the Plant and Wildlife Habitat Assessment Guidelines, Technical Bulletin 92-002.

Policy 2: Clearing of vegetation and alteration of natural topography shall be minimized, with native vegetation planted as needed to enhance or restore wildlife habitat. Standing specimen trees shall be protected. The permitting authority may require designation of building envelopes (for structures, driveways, lawns, etc.), where appropriate to limit removal of vegetation.

Policy 3: Fragmentation of wildlife and plant habitat shall be minimized by the establishment of greenways and wildlife corridors of sufficient width to protect not only edge species, but species that inhabit the interior forest, as well as by the protection of large unfragmented areas, and the use of open space or cluster development. Wildlife shall be provided with opportunities for passage under or across roads and through developments where such opportunities will maintain the integrity of wildlife corridors.

Policy 4: Developments that would adversely affect habitat of local populations of rare wildlife and plants shall not be permitted. Development may be permitted where the proponent can demonstrate that such development will not adversely affect such habitat. A wildlife and plant habitat management plan may be required as a condition of approval when development or redevelopment is permitted in critical wildlife and plant habitat areas.

Policy 5: Where a project site is located adjacent to a vernal pool or within or adjacent to wetland-dependent rare species habitat, development shall be prohibited within a 350-foot undisturbed buffer around these wetland resources. New stormwater discharges shall be located a minimum of 100 feet from vernal pools.

Policy 6: Development on sites where a natural resources inventory identifies the presence of invasive plant species shall provide and implement a management and restoration plan detailing the management of, and where possible, the eradication of the invasive species present, and for revegetating the site with native species.

Other Development Review Policies

Policy 8: Measures to restore altered or degraded upland habitat areas should be encouraged where ecologically appropriate (e.g., sand plain grasslands, Pine Barrens, etc.).

## LAND ACQUISITION

### Goal 10: To develop and implement an ongoing land acquisition program.

Minimum Performance Standards

Policy 1: Implement, and update every three years, the Resource Management Plan

for all Town-owned land.

Policy 2: Maintain a Land Acquisition Committee, as the Open Space Committee, (by appointment from the Board of Selectmen) to make recommendations to the Selectmen and Town Administrator on the purchase of land for Open Space, conservation, and recreation within the Town.

Policy 3: Evaluate any potential land purchases using the following criteria, established by the Open Space Committee. These criteria define the general parameters and suggested importance of attributes to be considered.

Properties that:

- Protect water quality; contribute to well-field protection district; provide accessory equipment sites for a potential water supply distribution system.
- Access the Chapter 61 tax abatement program: agricultural, forest, open space/recreation.
- Provide links to Cape Cod Pathways/Bikeways network; Cape wide Greenbelt program where threshold criteria are met for wildlife habitat.
- Abut town conservation lands.
- Abut a body of water/marsh.
- Provide a potential town park, recreation or beach site.

## Section IX: Five Year Implementation Plan

This five-year plan is broken down into the same four sections as the Goals and Policies: open space and recreation, water resources, coastal resources, wetlands and wildlife and plant habitat and land acquisition.

### A. Open Space and Recreation

Develop a comprehensive open space protection program in order to meet future open space and recreation needs, protect community character, reduce growth pressures and maintain community fiscal health. This program should include expanded use of town acquisitions, conservation restrictions, subdivision set-asides, protection of tax title lands and other methods of open space protection. Priority shall be given to the following areas:

- Zones of contribution to public water supply wells
- Future water supply areas
- Rare species habitat and other critical habitats
- Unfragmented forest habitat
- Missing links between open space areas identified within the Cape-wide Greenbelt or Cape Cod Pathways/Bikeways networks.

- Update the Open Space and Recreation Plan every five (5) years and submit it to the Department of Environmental Management to maintain eligibility for open space funding under federal and state grant programs.

- Continue to include an annual amount for open space acquisition in the Town's capital budget.

- Work with the Eastham Conservation Foundation to identify, acquire and manage open space and conservation restrictions. Priority should be given to protection of significant natural and fragile areas including critical wildlife and plant habitat, water resources, historic, cultural and archaeological areas, scenic roads and views, unfragmented forest and significant landforms.

- Collaborate with the Eastham Conservation Foundation to work with landowners participating in the Chapter 61 programs to acquire conservation restrictions on those lands, and set aside funds for their purchase if they are proposed to be sold for development.

- Work with the Planning Board to create a cluster development bylaw and actively promote its use where this alternative would allow protection of open space and recreation lands and environmentally sensitive areas, and/or provide for needed trail corridors.

- The Planning Board should amend its subdivision regulations to take advantage of Section 81U of the Subdivision Control Law which permits towns to require open space set-asides within subdivisions for future acquisition.

- Continue to maintain, protect and improve public access to both freshwater and saltwater bodies for recreational purposes.

- The Pathways/Bikeways Committee should investigate possible loops or connectors with the existing biking and walking paths, identify parcels for acquisition, establish a bike safety course, recommend measures to mitigate safety concerns, and identify opportunities for additional parking in proximity to the Cape Cod Rail Trail. In particular, that committee should work with the National Park Service to develop open space and trail linkages to the Cape Cod National Seashore.

- Town-owned land within Cape Cod National Seashore should be maintained in open space use.

- The Town should maintain the full-time position of Recreation Director to organize each of the Town supported recreational activities and to expand the current programs to include all age groups.

- The Open Space Committee and the Recreation Commission should consider additional sites for ball field and basketball facilities. In addition, the Recreation Commission should consider construction or acquisition of an indoor swimming pool and development and staffing for an indoor swimming program for all ages.

- Encourage landowners to restore blighted or abandoned areas to open space, and encourage the use of more natural landscaping to reduce the usage of fertilizers and pesticides.

- Aggressively seek to acquire tax title lands and hold them for community purposes such as open space and recreation where such use would be consistent with the Open Space and Recreation Plan.

## B. Water Resources

- Develop by-laws and zoning regulations which protect the ground water resources of the Town, such as public water supply zones of contribution, municipal well field zones, marine embayments, and nitrate loading overlay districts in densely populated and/or vulnerable areas.

- Communication and coordination should be improved:

  1. Communication of basic water resource information to the people of Eastham so that provides (a) the information required for informed decision-making on water management issues presented at Town meeting and (b) encouragement of personal involvement in activities to preserve and protect the water supply on their own and on public lands.

  2. Institution of a system of communication and coordination among town committees involved in water resource issues, including the Board of Health, the Conservation Commission, the Planning Board, the Water Resources Advisory Committee, and the Board of Selectmen.

  3. Communication/coordination with the neighboring town(s), which share the same aquifer lens

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- Develop any necessary protection for fresh water ponds as the visible exposed top of the ground water table.

- Develop recommendations for actions necessary to preserve future options for sufficient quantity of high quality ground water for Eastham.

- Continued provision for and protection of potential sites for municipal water supply wells and their zones of contribution.

- Plan and implement a well water sampling program with continued monitoring.

- Continue hydro geological studies in vulnerable areas such as the transfer station and hazardous materials release sites.

- Develop by-laws and regulations to protect groundwater.

- Ensure protection of fresh water pond areas with regard to recreational use, monitoring for phosphorus levels, and watershed contamination.

- Ensure protection of fresh water wetlands and ponds from storm water discharges.

- Establish a 5-ppm nitrate-nitrogen loading standard consistent with the Cape Cod Commission Regional Policy Plan.

- Establish Environmentally Sensitive Area Zones requiring separate performance standards with regard to septic system upgrades and installations.

- Continue to reduce the use of road salt for control of ice and snow with due regard for the requirements of road safety.

- Educate the public on natural landscaping to encourage the use of native plants and organic pest control

## C. Coastal Resources

- Designate a "working waterfront" overlay zone in the area of Collins Landing in Town Cove to ensure the preservation and expansion of traditional maritime uses. Within this zone a boatyard preservation program should be implemented. All new buildings or accessory uses constructed within this zone should directly benefit maritime related uses.

- Confirm designated traditional rights-of-way to the shore through appropriate legal means. Efforts should continue to educate the public about shoreline issues and to attempt to resolve disputes between owners and users.

- Restrict development or increase in use in environmentally sensitive near-shore areas and limit septic impact of development.

- Initiate a harbor planning study, targeting Rock Harbor, to develop a framework and guidelines for use and dredging activities. Study results should serve as a baseline for developing a town-wide harbor management plan in accordance with state guidelines to implement watershed zoning in order to protect coastal resources and prevent use conflicts on the water.

- Review areas designated as Federal no discharge zones for boats to be certain they meet current Federal and State guidelines.

- Continue to cooperate with the regional efforts to provide disposal options for marine head waste.

- Monitor by-laws and regulations established to reduce the potential impacts to health and safety and the economy resulting from coastal storms in order to ensure necessary stringency.

- Update the list of projects that provide or enhance coastal access and use of their shoreline to be used in conditioning local MGL, Chapter 91 licenses.

- Encourage "soft" solutions (snow fencing, beach grass planting) to coastal erosion instead of engineered structures.

- Develop a comprehensive plan to require annual beach nourishment and

replenishment as a condition for permission to install, maintain or rebuild a revetment. Use sand drift fencing when appropriate.

- Secure easements for public ownership of tidal flats between mean high and mean low water.

- Maintain a regular dredging schedule for Rock Harbor.

- Explore the feasibility for using Rock Harbor dredged materials for beach nourishment projects.

- Continue to upgrade and expand beach services, including clean, adequate handicapped-accessible toilet facilities at each beach; benches, picnic tables and trash receptacles, bicycle parking, additional planting and fencing to delineate sensitive dune areas; uniform and user friendly signage.

- Implement a continuing environmental education program.

- Continue the activities of the volunteer corps of year-round and seasonal residents in helping with beach maintenance, possibly on an "adopt a beach" program.

- Continue and expand the shellfish propagation and predator control efforts for both recreational and commercial uses.

- Pursue the establishment of community rather than individual private docks in the area of Town Cove.

- Identify and cleanup the existing point source discharges of storm water from roadways such as Route 6.

- Target the salt marsh areas along Cape Cod Bay, which are subject to administrative closure for sanitary survey and restoration/remediation programs.

## D. Wetlands, Wildlife and Plant Habitat

- With assistance from the Cape Cod Commission, map wetlands at a scale appropriate to local regulatory programs. These maps should include areas of housing density identified as dense, moderate, and sparse for use by the Open Space Committee, Board of Health and the Conservation Commission.

- Wetlands and vernal pools should be identified, mapped and protected so as to maintain their ability to provide natural functions. Local schools should be encouraged to participate in this effort.

- Adopt a wetlands by-law that provides for the following: protection of vernal pools outside other resource areas as well as isolated wetlands; a policy of no alteration or replication of wetlands for both public and private applicants; expansion of jurisdiction beyond one-hundred (100) feet where appropriate; improved enforcement authority; and the ability to hire consultants to review applications at the applicant's expense.

- The Open Space Committee and Eastham Conservation Commission should continue to work closely with the Board of Health and other relevant Town boards to develop mutually acceptable policies for wetland boundary delineation, and the siting of new subsurface disposal systems in relation to these areas as well as improving and retrofitting areas with failing systems.

- Develop and implement plans to address existing stormwater management problems where runoff and drainage systems are adversely affecting water quality standards in wetlands and water bodies.

- Seek ways to remediate tidal restrictions, including incorporating improvements to restricted areas into planned road and bridgework, and by seeking funding and partnering opportunities with the state and affected private entities.

- Conduct an analysis to assess potential growth impacts to wetlands, wildlife and plant habitat areas, identifying those that are protected as well as those threatened by development. The map developed for the analysis should be used to develop strategies to address identified threats.

- Continue to encourage conservation restrictions as a tool for landowners to maintain open habitat.

- Develop a review process for activities in critical plant and wildlife habitat areas that could adversely impact such habitat and/or seek designation as significant habitat areas under the Massachusetts Endangered Species Act.

- Encourage Friends of Wiley Park to continue planting indigenous trees to re-create the Forest of 1651.

## E. Land Acquisition

- Implement the Resource Management Plan for all Town-owned land, with updates every three (3) years.

- Make recommendations for land purchases for open space and recreation.

- Re-evaluate and maintain the formalized system for evaluating potential land purchases.

The Five Year Implementation plan is also presented in spread-sheet format on the following pages, organized in the same manner as the Goals and Policies, and an implementation plan by year in a separate spread sheet format.

| LCP ELEMENT | RECOMMENDATION | ACTION | RESPONSIBLE BOARD/AGENT | ESTIMATED PRIORITY | COST TO TOWN |
|---|---|---|---|---|---|
| **LAND USE/ GROWTH MANAGEMENT** | Adjust zoning to accommodate recommendations of the land use plan, e.g., adopt a Highway Residential District and a Working Waterfront Overlay Zone. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Amend the zoning bylaws to allow for mixed-use developments in the Highway-Residential District. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Augment performance standards, e.g. for lighting, noise, and odors by revising the zoning bylaws. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Amend the zoning bylaws to add language on curb cut control and develop a comprehensive curb cut strategy to Route 6. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Revise the zoning bylaws for building and parking setback and landscaping requirements for commercial developments. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Study the possibility of working with N/Star and the state and consider funding of undergrounding of utility lines along town roads or on town-owned land in any area where the required poles, wires, cables, aerial transformers and other related electrical and telecommunications equipment are deemed visually intrusive and/or a safety hazard. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |

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| | Revise and reformat the Zoning bylaws and develop a Table of Use Regulations and a Table of Dimensional Requirements. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Amend the Zoning bylaws to establish a multi-category threshold that would trigger special permit review of large/high traffic generating commercial and mixed-use developments. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| **LAND USE/ GROWTH MANAGEMENT** | Amend the Zoning bylaws to create a definition of "strip" development and make it a prohibited use in the table of use regulations. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Develop a zoning amendment that provides incentives for shared access to developments by way of zero side lot lines or reduced parking requirements. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Revise Section IX, B setback requirements and Section XI landscaping requirements to provide for thickly vegetated buffers. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Prepare plans for the Town Hall and Brackett Road areas, to include sidewalks, footpaths, parking, pedestrian crossing, traffic mitigation, lighting, landscaping and undergrounding of overhead utilities. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Purchase vacant land as protected open space, especially on Route 6 | Send Mailing to Property Owners/Monitor for Opportunities | Town Admin /BOS/Planning Board/Town Meeting | Ongoing | OB/WA/Grants |

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| | Increased lot frontage requirements on Route 6 | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Increased lot sizes for residential development on Route 6 | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Strict limits for lot coverage for commercial uses on Route 6 with incentives for shared curb cuts with adjacent residential properties | Prepare Zoning Amendments | Planning Board/ Town Meeting | 2 | OB |
| | Explore aggressive measures to limit conversion of seasonal homes to year round uses on small lots. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Explore other measures to limit buildout throughout the Town | Prepare Zoning Amendments | Planning Board/ Town Meeting | Ongoing | OB |
| | Amend its subdivision rules and regulations to take advantage of the three open space dedication provisions in MGL, Ch.41 Subdivision Control Law. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| **LAND USE/ GROWTH MANAGEMENT** | Amend its subdivision rules and regulations to require the submitting of a preliminary cluster plan for new development of five or more lots. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Amend its subdivision rules and regulations to require natural drainage designs with buffers to wetlands. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Amend its subdivision rules and regulation to require separate drainage lots and access ways to drainage areas. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |
| | Amend its subdivision rules and regulations to require plan sheets showing regrading, landscaping and erosion control methods to be used on the property. | Prepare Zoning Amendments | Planning Board/ Town Meeting | 1 | OB |

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| **WATER RESOURCES** | Develop long-term and short-term potable water management plans. | Continuing Activity | WRAB | Ongoing | OB/WA |
| | Monitor groundwater contamination and propose remediation programs. | Continuing Activity | HD, WRAB | Ongoing | OB |
| | Develop a systematic well water quality monitoring program and water quality database. | Activate Program | HD/BOH, WRAB | 1,2 | OB/WA |
| | Conduct hydrogeological studies in vulnerable or impaired areas of Town (landfill, Brackett Road, Route 6, HAZMAT release sites). | Continuing Activity | HD | Ongoing | OB |
| | Plan financial resources for: development of a water quality database; hydrogeological and water quality studies in impaired areas; implementation of water supply management recommendations. | Develop Action Plan | WRAB, Town Admin, FinCom | 1 | OB/WA |
| | Develop recommendations and support actions that will preserve future options for quality groundwater supply sources. | Continuing Activity | Open Space, HD/BOH, WRAB, LandCom | Ongoing | OB |
| **WATER RESOURCES** | Determine quality and quantity of potable water available for: on-site supply wells; a public water supply limited to areas with significantly degraded groundwater; a public water supply to all areas. | Initiate Program | NRO, WRAB | 2 | OB |
| | Explore establishment of town-wide limited public water supply. | Review Needs and Options | WRAB | Ongoing | OB |
| | Assess the need for designation of additional environmentally sensitive areas where special protective measures for water would be appropriate. | Identify Areas | BOH/HD,WRAB | Ongoing | OB |

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| | Develop long-range wastewater management plan. | Develop Plan | BOH,WRAB | 3 | OB |
| | Promote use of alternative septic treatment systems where they can provide benefits. | Continuing Activity | BOH/HD, WRAB | Ongoing | OB |
| | Support and ensure diligent monitoring and maintenance of alternative septic treatment systems. | Initiate Program | BOH/HD | 3 | OB |
| | Explore wastewater management alternatives and objectives by initiating wastewater management planning activities. | Review Needs and Options | BOH/HD, WRAB,CPC | 1 | OB |
| | Continue the formulation of bylaws and regulations that will protect Eastham's water resources. | Continuing Activity | NRO, HD/BOH, WRAB | Ongoing | OB |
| | Expand and improve public education and the dissemination of information about water contamination issues. | Ongoing | WRAB, HD/BOH | 1 | Grants, OB |
| | Actively promote water conservation to reduce the volume of clean water that is converted into contaminated wastewater. | Develop Program | WRAB | 1 | Grants |
| **WATER RESOURCES** | Improve communication and coordination of water resources information: among Town boards/committees and staff concerned with water resources (i.e., BOH/HD, NRO/ConCom, Open Space, LandCom, DPW, Town Admin); and in particular between Eastham, Orleans, Wellfleet, and National Seashore. | Plan Approaches | All Boards with WRAB Coordination | 1 | OB, Grants |

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| | Develop and implement measures to protect freshwater ponds, wetlands and coastal embayments against the harmful effects of contamination from various sources and recreational uses. | Continuing Activity | NRO, ConCom | Ongoing | OB |
| | Protection of the tidal flushing of all wetlands. | Develop Program | NRO, ConCom | 2 | OB |
| | Implement protection for freshwater wetlands and ponds from stormwater discharge. | Continuing Activity | NRO, DPW, ConCom | Ongoing | OB |
| | Enforce the present 5 ppm nitrate-nitrogen loading standard. | Continuing Activity | BOH, DPW | Ongoing | OB |
| | Limit the introduction of chemicals such as fertilizers and pesticides into the groundwater. | Explore Options | WRAB | 1 | OB |
| | Continue to reduce the use of road salt. | Continuing Activity | DPW, ConCom | Ongoing | OB |
| **COASTAL RESOURCES** | Designate a "working waterfront" overlay zone in the area of Collins Landing in Town Cove to ensure the preservation and expansion of traditional maritime uses. | Prepare Zoning Amendments | ConCom/NRO/ Planning Board | 2 | |
| | Confirm designated traditional rights-of-way to the shore through appropriate legal means. | Develop Program | ConCom/NRO | 3 | OB/Grants |
| | Restrict development or increase in use in environmentally sensitive nearshore areas and limit septic impact of development. | Revise Regulations | ConCom/BOH | 2 | OB |
| **COASTAL RESOURCES** | Initiate a harbor planning study, targeting Rock Harbor, to develop a framework and guidelines for use and dredging activities. | Initiate Study | ConCom/NRO | 3 | OB/Grants |

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| Review areas designated as Federal no discharge zones for boats to be certain they meet current Federal and State guidelines. | Monitor | ConCom/NRO | Ongoing | OB |
| Continue to cooperate with the regional efforts to provide disposal options for marine head waste. | Monitor | ConCom/NRO | Ongoing | OB |
| Monitor by-laws and regulations established to reduce the potential impacts to health and safety and the economy resulting from coastal storms | Review After Coastal Storms | ConCom/ Planning Board | Ongoing | OB |
| Update its list of projects that provide or enhance coastal access and use of their shoreline. | Update Inventory | ConCom/NRO | 3 | OB/Grants |
| Encourage "soft" solutions to coastal erosion instead of engineered structures. | Develop Recommended Measures | ConCom/NRO | 2 | OB |
| Develop a comprehensive plan to require annual beach nourishment/replenishment as a condition for permission to install, maintain or rebuild a revetment. | Develop Plan | ConCom/NRO | 1 | OB/Grants |
| Secure easements for public ownership of tidal flats between mean high and mean low water. | Monitor for Opportunities | ConCom/NRO | 3 | WA/Grants |
| Maintain a regular dredging schedule for Rock Harbor. | Develop Program | ConCom/NRO | 1 | OB |
| Explore the feasibility of using Rock Harbor dredged materials for beach nourishment projects. | Explore Options | ConCom/NRO | 2 | WA/Grants |
| Continue to upgrade and expand beach services. | Upgrade Services | ConCom/NRO/Re creation | Ongoing | OB/Grants |

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| | Implement a continuing environmental education program. | Develop Program | ConCom/NRO | 3 | OB/Grants |
| **COASTAL RESOURCES** | Continue and expand the shellfish propagation and predator control efforts for both recreational and commercial uses. | Expand Program | ConCom/NRO | Ongoing | OB |
| | Pursue the establishment of community rather than individual private docks in the area of Town Cove. | Develop Program | ConCom/NRO | 2 | OB |
| | Identify and cleanup the existing point source discharges of storm water from roadways such as Route 6. | Develop Program | DPW/ConCom | 1 | OB/WA/Grants |
| | Target the salt marsh areas along Cape Cod Bay, which are subject to administrative closure for sanitary survey and restoration/remediation programs. | Develop Program | ConCom/NRO | 2 | OB/WA/Grants |
| | Wetlands and vernal pool should be mapped, identified, and protected so as to maintain their ability to provide natural functions. | Conduct Mapping | ConCom/NRO | 2 | OB/Grants |
| **WETLANDS WILDLIFE AND PLANT HABITAT** | Adopt a wetlands bylaw that provides for the following: protection of vernal pools outside other resource areas as well as isolated wetlands, a policy of no alteration/replication of wetlands for both public and private applicants, expansion of jurisdiction beyond 100 feet where appropriate, improved enforcement authority, and the ability to hire consultants to review applications at the applicant's expense. | Revise Regulations | ConCom/NRO | 1 | OB |

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| | Develop mutually acceptable policies for wetland boundary delineation and the siting of new subsurface disposal systems as well as improving and retrofitting areas with failing systems. | Develop Policies | ConCom/BOH | 1 | OB |
| **WETLANDS WILDLIFE AND PLANT HABITAT** | Develop and implement plans to address existing stormwater management problems where runoff and drainage systems are adversely affecting water quality in wetlands and water bodies. | Develop Program | ConCom/DPW/BOH/Planning Board | 1 | OB/WA/Grants |
| | Seek ways to remediate tidal restrictions | Identify Measures | ConCom/DPW | 2 | Grants |
| | Develop a review process for activities in critical plant and wildlife habitat areas | Develop Program | ConCom/NRO | 2 | OB |
| | Adopt by-laws/ordinances limiting land clearing and alteration of natural topography prior to development review. | Prepare Zoning Amendments | ConCom/ Planning Board | 2 | OB |
| | Conduct an analysis to assess potential growth impacts upon wetland areas | Conduct Analysis | ConCom/NRO | 2 | OB |
| | Conduct an analysis to assess potential growth impacts upon wildlife and plant habitat areas | Conduct Analysis | ConCom/NRO | 2 | OB |
| **OPEN SPACE** | Develop a comprehensive open space protection program in order to meet future open space and recreation needs | Develop Program | Open Space/ConCom/Recreation | 2 | OB/Grants |

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| | Update its Open Space and Recreation Plan every five (5) years and submit it to the State to maintain eligibility for Open Space funding under federal and state grant programs. | Update Plan | Open Space/ ConCom/NRO / BRD/ Planning Board | 1 | OB/Grants |
| | Work with the Eastham Conservation Foundation to identify, acquire and manage open space and conservation restrictions. | Coordinate Activities | Open Space/ ConCom/NRO | Ongoing | OB |
| **OPEN SPACE** | Work with the Eastham Conservation Foundation and with landowners participating in the Chapter 61 programs to acquire conservation restrictions on those lands or should set aside funds for their purchase if they are proposed to be sold for development. | Coordinate Activities | Open Space/ ConCom/NRO | Ongoing | OB |
| | Develop a cluster by-law and actively promote its use where this alternative would allow protection of open space and recreation lands, environmentally sensitive areas and/or provide for needed trail corridors. | Prepare Zoning Amendments | Open Space/ ConCom/Planning Board | 1 | OB |
| | Amend its subdivision regulations to take advantage of Section 81U of the Subdivision Control Law which permits towns to require open space set-asides within subdivisions for future acquisition. | Amend Regulations | Planning Board | 1 | OB |
| | Continue to maintain and protect public access to both freshwater and saltwater bodies for recreational purposes. | Continue Monitoring | ConCom/BOH/ NRO | Ongoing | OB/Grants |

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| | Investigate possible loops or connectors with the existing biking and walking paths, identify parcels for acquisition, establish a bike safety course, recommend measures to mitigate safety concerns, and identify opportunities for additional parking in proximity to the Cape Cod Rail Trail. | Review Opportunities | Planning Board/Bike Committee | Ongoing | OB |
| | Maintain Town-owned land within the Cape Cod National Seashore as open space. | Maintain | ConCom/NRO | Ongoing | OB |
| | Continue to expand the current programs to include all age groups and consider additional sites for ball field and basketball facilities. | Expand Programs | Recreation | Ongoing | OB |
| **OPEN SPACE** | Construct a multi-use sports building.<br>Encourage landowners to restore blighted or abandoned areas to open space. | Develop Plan<br>Develop Program | Recreation<br>ConCom/NRO/ Planning Board | 2<br>3 | OB/WA/Grants<br>OB/Grants |
| | Aggressively seek to acquire tax title lands and hold them for community purposes. | Monitor for Opportunities | BOS | Ongoing | OB/WA/Grants |
| | Evaluate the need for a youth center community facility. | Conduct Study | Recreation | 2 | OB |
| | Consider recreation needs in the development of plans for the Town Hall area and for the Route 6 and Brackett Road area. | Incorporate into Study | Planning | 2 | OB |
| | Revise Open Space Map to include key differentiating between types of ownership/control. | Develop Map | Open Space/ Planning Board | 2 | OB |

Accessibility Plan for Beaches
Five Year Plan Adopted 1996 by the Public Access Committee

**These projects will all require funding through a combination of general revenue funds either in the operating capital budget or grants.

I. Getting There

| | Goal | Cost |
|---|---|---|
| | Extend walkway at First Encounter Beach to water level at shore line | $100 - $500 |
| | Roadside signs and pictographs; printed matter for visitors | $100 - $500 |
| | Relocate parking/drop-off spaces | none |
| | Additional beaches: Cooks Brook, Sunken Meadow | $500 - $1,500 per beach |
| | Different materials challenge level 1 walkways | $500 - $1,500 |
| | Interpretive overviews | $2,000 - $5,000 |

II. Restrooms

| | Goal | Cost |
|---|---|---|
| | Portable facilities with ramps | $1,200 |
| | "accessible" | $1,800 |
| | ADA-compliant | $1,800 each; 1-2 units per year |
| | Begin renovation of fixed facilities | $10,000 |
| | Complete acquisition of ADA-compliant | $1,800 each; 1-2 units per year |

| | | |
|---|---|---|
| | Complete fixed facilities | $25,000 |
| | Information Booth/upgrade to fixed facility | $10,000 |

III. Boating and Fishing Interests

| | Goal | Cost |
|---|---|---|
| | Rock Harbor | none new facility |
| | Fresh water fishing facilities dock/curbs | $3,000 - $10,000 |
| | Fishing habitat enhancement | $500 - $1,000 |
| | Salt Pond, Hemenway Landing, Collins Landing, Boat Meadow Creek: ramp/dock | variable to $10,000 |

IV. Other Uses

| | Goal | Cost |
|---|---|---|
| | Maintain Wiley Park challenge level 1 trails | minimal |
| | Develop picnic areas at Wiley Park | $1,000 |
| | Herring Run sites | $500 - $1,000 |
| | Cape Cod Pathways connections | $5,000 |
| | TDD at Information Booth | unknown |
| | Swimming platform fresh water pond(s) | $5,000 |
| | Equestrian facilities | $500 - $1,000 |

| OPEN SPACE | | |
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| | | |
| **2003 Actions** | | |
| 1. Update its Open Space and Recreation Plan every five (5) years and submit it to the State to maintain eligibility for Open Space funding under federal and state grant programs | Update Plan | Open Space/ ConCom/NRO / BRD/ Planning Board |
| 2. Develop a cluster by-law and actively promote its use where this alternative would allow protection of open space and recreation lands, environmentally sensitive areas and/or provide for needed trail corridors | Prepare Zoning Amendments | Open Space/ ConCom/Planning Board |
| 3. Amend its subdivision regulations to take advantage of Section 81U of the Subdivision Control Law which permits towns to require open space set-asides within subdivisions for future acquisition | Amend Regulations | Planning Board |
| | | |
| | | |
| **2004 Actions** | | |
| 1. Develop a comprehensive open space protection program in order to meet future open space and recreation needs | Develop Program | Open Space/ConCom/Recreation |
| 2. Construct a multi-use sports building | Develop Plan | Recreation |
| 3. Evaluate the need for a youth center community facility | Conduct Study | Recreation |
| 4. Consider recreation needs in the development of plans for the Town Hall area and for the Route 6 and Brackett Road area | Incorporate into Study | Planning |
| 5. Revise Open Space Map to include key differentiating between types of ownership/control | Develop Map | Open Space/ Planning Board |
| | | |
| **2005 Actions** | | |
| 1. Encourage landowners to restore blighted or abandoned areas to open space | Develop Program | ConCom/NRO/ Planning Board |
| | | |
| **Ongoing Actions** | | |

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|---|---|---|
| 1. Work with the Eastham Conservation Foundation to identify, acquire and manage open space and conservation restrictions | Coordinate Activities | Open Space/ ConCom/NRO |
| 2. Work with the Eastham Conservation Foundation and with landowners participating in the Chapter 61 programs to acquire conservation restrictions on those lands or should set aside funds for their purchase if they are proposed to be sold for development | Coordinate Activities | Open Space/ ConCom/NRO |
| 3. Continue to maintain and protect public access to both freshwater and saltwater bodies for recreational purposes | Continue Monitoring | ConCom/BOH/ NRO |
| 4. Investigate possible loops or connectors with the existing biking and walking paths, identify parcels for acquisition, establish a bike safety course, recommend measures to mitigate safety concerns, and identify opportunities for additional parking in proximity to the Cape Cod Rail Trail | Review Opportunities | Planning Board/Bike Committee |
| 5. Maintain Town-owned land within the Cape Cod National Seashore as open space | Maintain | ConCom/NRO |
| 6. Continue to expand the current programs to include all age groups and consider additional sites for ball field and basketball facilities | Expand Programs | Recreation |
| 7. Aggressively seek to acquire tax title lands and hold them for community purposes | Monitor for Opportunities | BOS |