



Town of Harwich

Open Space and Recreation Plan

April 28, 2010

TOWN OF HARWICH
OPEN SPACE AND RECREATION PLAN – 2010
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**TOWN OF HARWICH
OPEN SPACE AND RECREATION PLAN
2010**

I. PLAN SUMMARY

Summary of Recommendations, Goals, and Objectives

The 2010 Town of Harwich Open Space and Recreation Plan represents an update of the 1998 Open Space and Recreation Plan, an extension of the 2000 Town of Harwich Local Comprehensive Plan, and a step in the preparation of the 2010 Local Comprehensive Plan. This plan includes an assessment of current open space and recreation needs, a statement of goals and objectives to fill the Town's needs, and an action plan in which to meet these goals.

The open space recommendations from the 1998 Open Space and Recreation Plan sought to preserve a significant amount of permanent open space at minimal cost to the Town. Utilizing proposed zoning amendments in concert with strategic land acquisitions, several hundred acres town-wide were targeted for preservation. The plan sought to create greenbelt areas containing contiguous open space as well as setting priorities for land acquisition. Along with creation and preservation of permanent open space, the plan sought to restore and protect associated natural resources.

Recommendations pertaining to recreation included enhancement, protection, and linkage of existing trail corridors, more active recreation facilities, greater utilization of the Harwich Community Center, and improved access to recreational facilities for disabled residents.

The Town has made good progress in carrying out land acquisition goals of the 1998 Open Space and Recreation Plan. With increased land ownership and stewardship, the 2010 plan recognizes that increased attention must be given to land management issues. Whether focusing on land acquisition or management, the following goals from the 1998 Open Space and Recreation Plan are still valid in the 2010 Open Space and Recreation Plan:

- ✧ Preserve and enhance the management of open space in Harwich
- ✧ Protect natural resources and community character through growth management strategies
- ✧ Preserve and enhance groundwater and surface water; coastal water and adjacent shoreline areas; inland and coastal wetlands; and wildlife and plant habitats
- ✧ Preserve and enhance opportunities for passive and active recreation in the natural environment to meet the needs of both residents and visitors

II. INTRODUCTION

A. Statement of Purpose

The 2010 Open Space and Recreation Plan bridges vision statements from the approved 2000 Town of Harwich Local Comprehensive Plan and the draft 2010 Local Comprehensive Plan.

From 2000: “We see the residents of Harwich coming together to support those actions that will enhance the small town atmosphere that is prized by current residents and visitors alike. The outcome will be a pleasant environment for living, working, recreation and shopping with enhancement of existing village centers and commercial areas. We will take those actions necessary to provide for the appropriate use of land and a variety of housing types, residential densities, and neighborhoods in order to maintain social diversity. All actions will be consistent with the carrying capacity of Harwich’s natural environment, the Cape Cod Commission’s Regional Policy Plan, and the ability to support the required infrastructure.”

From 2010: “We cannot fail to recognize, protect and enhance the vitality of our cultural, recreational and natural assets that are so essential to our residents, non-resident taxpayers, and seasonal guests alike ... Pursuit of this vision pays homage to our unique coastal environment and vibrant New England traditions of independence and self-determination.”

The 2010 Open Space and Recreation Plan uses the background information pertaining to all the above-mentioned issues and attempts to provide a comprehensive framework to guide the Town toward providing and protecting a greater quantity of quality open space and recreational facilities.

B. Planning Process and Public Participation

The 2010 Open Space and Recreation Plan draws from the 1998 Open Space and Recreation Plan and the 2000 Town of Harwich Local Comprehensive Plan. A number of public meetings and public hearings were held over several years to allow the public the opportunity to comment on the content of the Local Comprehensive Plan. In addition, discussions of various Local Comprehensive Plan elements took place with other Town agencies, and various governmental bodies. Open Space and Recreation is a very important subject to the Town and a topic that was discussed at length at meetings of the Planning Board, Real Estate and Open Space Committee, Conservation Commission, Trails Committee and Youth and Recreation Commission to come to a consensus on the direction the community should take to provide for more and better passive and active recreation opportunities.

In May 2009, the Harwich Planning Board distributed a citizen survey to voters leaving polling places on town election day. Survey responses (see Section VII) provided an

important gauge of public attitudes towards open space and were considered carefully in preparation of the draft Open Space and Recreation Plan.

The Planning and Conservation Departments, assisted by the Cape Cod Commission, were the primary researchers and writers of the draft Open Space and Recreation Plan. Following preparation of an initial draft, members from various boards and committees - the Planning Board, Conservation Commission, Recreation and Youth Commission, Real Estate and Open Space Committee, Trails Committee, and the Community Preservation Committee - were invited to a public meeting held in June 2009. The initial draft was revised based on board and committee comments and submitted to the Executive Office of Energy and Environmental Affairs (EOEEA) in July 2009.

The draft Open Space and Recreation Plan was approved by EOEEA with a list of required items to be addressed prior to final approval. Town departments involved in responding to those items included Conservation, Harbormaster/Natural Resources, Recreation and Youth, Council on Aging/ADA, and Planning.

One of the most important responses was a parcel-by-parcel review in fall 2009 of several hundred town-owned open space parcels. Accessibility for all major parcels was reviewed by the ADA coordinator. Conservation Commission members and others researched conservation or other deed restrictions on the various parcels. The Recreation Director updated comments on parcels with recreation potential. Databases for all parcels were tied to the Town's emerging GIS system.

The fall 2009 review of the draft Open Space and Recreation Plan overlapped with preparation of the 2010 Local Comprehensive Plan. A public meeting was held by the Planning Board in December 2009 and addressed issues relating to open space, covering many of the same topics found in this plan. Attendees included representatives from the Real Estate and Open Space Committee, Housing Committee, Conservation Commission, Trails Committee, Harwich Conservation Trust and the Board of Selectmen.

A new draft of the Open Space and Recreation Plan was distributed to the above committees in March 2010. Following another public meeting in April and subsequent review by the Planning Board, Conservation Commission and Board of Selectmen, the final plan was submitted to EOEEA.

Without the participation of so many people over years of interest in open space and recreation planning, the following information and plan would be incomplete.

III. COMMUNITY SETTING

A. Regional Context

1. Location

Harwich is located in the Lower Cape area, approximately twenty-four miles from the Cape Cod Canal and roughly twenty-seven miles from Provincetown, the tip of the Cape. It shares borders with Dennis to the west, Brewster to the north, and Chatham to the east. A common boundary with Orleans (to the northeast) exists in Pleasant Bay. Harwich is generally within twenty minutes driving time of Hyannis and Orleans, two nearby centers of economic activity. It is also along the way to the Cape Cod National Seashore and Chatham which are visited each year by a great number of tourists.

Figure 1 shows Harwich's location on Cape Cod

Cape Cod, which comprises all of Barnstable County in Southern Massachusetts, is a sandy, resort-oriented peninsula within easy driving distance of three metropolitan areas: Boston; Providence, RI; and New Bedford/Fall River. Cape Cod is a convenient destination for residents of these areas seeking the various travel and tourism related features the Cape has to offer. Although less convenient, the Cape is a reasonable drive away from many other growing northeastern metropolitan areas, including New York City; Hartford, Connecticut; Albany, New York; Montreal, Quebec; Manchester, New Hampshire; and Portland, Maine. Given its accessibility and appealing natural and built features, it is reasonable to expect continued pressure for growth on Cape Cod.

2. Attractive Resort and Retirement Area

Cape Cod is widely known as a resort area. Each year, an increasing number of people visit Cape Cod, especially in the summer. While the average length of stay by overnight visitors has diminished in recent years, the number of day trippers has increased. This is one factor which has contributed to the increase in traffic volume over the Cape's two access bridges. Lodging, restaurants, gift shops, and recreational facilities have proliferated over the years to accommodate the ever-growing visitor demand.

The number of retirees on Cape Cod has grown considerably in the past decade. A clean and beautiful environment, relatively low property taxes and a generally slower pace of life are factors which continue to draw more and more retired residents

3. Access

Harwich can be reached by many different approaches, the most heavily traveled being Route 6, a limited access state highway. There are two Route 6 interchanges (Exits 10 and 11) in Harwich which provide safe and convenient access to the interior areas of the Town. Another state highway running east-west through Town is Route 28, which provides access to commercial and salt water beach areas. Harwich may also be approached from the north via Routes 124, 137, 39 and Depot Street; from the east and southeast via Queen Anne Road and Route 137; and from the west via Old Chatham

Road, Depot Street, Route 28 and Lower County Road. Bus transportation has increased with the addition of the Flex Bus service to Hyannis and Provincetown.

The Town is also accessible via three marinas on Nantucket Sound, and Chatham Airport which is roughly ten minutes from Harwich Center. No rail service exists.

4. Town Interrelationships

There are nine areas of Town which share certain common aspects and influences with portions of Harwich's neighboring towns. These are identified briefly below:

South Harwich/South Chatham – These two areas share similar levels of mixed residential and commercial development along Route 28, as well as a compatible scale of architecture and character.

East Harwich/Chatham – Environmental features such as Muddy Creek, the Pleasant Bay Area of Critical Environmental Concern, and zones of contribution to public water supply wells are common to these two areas.

East Harwich/Brewster at Route 137; East Harwich/Brewster at Route 124; East Harwich and Pleasant Lake/Brewster at Long Pond; Pleasant Lake/Brewster at Seymour's Pond – Each of these four areas enjoy a general consistency of land use and character. All four have recreational ponds in common.

North Harwich/Brewster at Westgate Road and at Depot Street – These areas have a similar rural and somewhat remote character which is enhanced by the considerable amounts of undeveloped, publicly owned land in both towns.

North Harwich/South Dennis at Great Western Road and at Depot Street – Industrial uses in both communities are fairly consistent and compatible except at the Depot Street border where there is a conflict of land use between residential and industrial. This industrial area bears no evidence of a town boundary running through it and can be viewed as a single geographic place.

West Harwich and Dennisport at Route 28 and at Lower County Road – The density, styles, and quantities of residential and commercial uses in these areas are generally consistent between towns. The most prominent common aspect is the seasonal nature of many of the uses.

5. Growth Implications

The Town's location and easy accessibility are generally conducive to continued growth. Modest commercial growth pressure will continue along Route 28 in Harwich, although this area is collectively not as developed as corresponding areas in Dennis and Yarmouth to the west and downtown Chatham to the east. More recently, a commercial center has developed at the intersections of Routes 39 and 137 in East Harwich. This area has the most potential for additional commercial growth in Harwich; however, recent planning

workshops have suggested movement towards a mix of commercial and residential development.

The Town's proximity to existing employment centers and the continued growth of its own commercial and industrial base will provide continued pressure for housing development for quite some time. Added to this is the existing and potential pressure for more retirement housing due to Harwich's location in resort/retirement areas. While the number of new homes being built in Harwich every year has declined, the search for available land to develop for housing, commercial and industrial uses continues. As land becomes more valuable and more scarce, parcels previously considered only marginally developable are coming under increased development pressure. Also, smaller summer cottages are being demolished and larger houses are being built.

6. Institutional Relationships

In March 1990, Cape Cod voters established the Cape Cod Commission , a regional land use planning and regulatory agency with powers to regulate Developments of Regional Impact.. Under the Cape Cod Commission Act, sub-areas within one or more towns can be designated "Districts of Critical Planning Concern". Harwich took advantage of this designation in 1999 by creating the Six Ponds District of Critical Planning Concern. This designation enabled special district zoning bylaws to be created to guide and regulate growth and protect critical resources within the Six Ponds area.

The Cape Cod Commission also prepares and updates the Barnstable County Regional Policy Plan, which provides consistent and specific guidance for the development of land use plans and regulations in each of the Cape's fifteen towns. The Act encourages the creation of local comprehensive plans which are consistent with the goals and policies of the Regional Policy Plan. Those towns which produce plans which are certified as consistent with the regional plan are entitled to assess and collect impact fees on new development and enter into development agreements. Such agreements allow for negotiations between the Cape Cod Commission, a town, and a developer to establish the specific development regulations that will apply to the subject property during the terms of the agreement.

The Commission's authority to directly regulate large developments has an impact on the issuance of local permits. Under the Act, a municipal permitting agency such as the Planning Board or Board of Health, must suspend its review of an application for a development which meets one or more of the thresholds for Developments of Regional Impact (DRIs), immediately upon determining that it qualifies as a DRI. Once a decision approving the development is issued by the Commission, local review may resume.

7. Inter-jurisdictional Arrangements

Portions of Harwich are involved in the following two inter-jurisdictional arrangements:

- a. Pleasant Bay Area of Critical Environmental Concern (ACEC) – The Towns of Harwich, Chatham, Orleans and Brewster have land in the Pleasant Bay ACEC. The towns, together with the Pleasant Bay Resource Management Alliance, have prepared

and updated a Pleasant Bay ACEC Resource Management Plan. Recent work includes a study of hydrodynamic scenarios to determine the optimal culvert size to improve flow between Muddy Creek and Pleasant Bay.

b. Drinking Water Resource Protection Districts (DWRPDs) – Harwich, Brewster, Chatham and Dennis have cooperated to establish mutually supportive DWRPDs in order to protect the drinking water supplies which straddle town boundaries. The 2008 Harwich Annual Water Quality Report cited a recent study of the Monomoy Lens by the United States Geological Service which concluded that we are using 4% of the available water for our water supply.

The Towns of Harwich and Brewster received a state grant to clean up Long Pond by the use of aluminum sulfate to control nuisance algae and reduce nutrients. In the near future both towns will be developing a pond management plan.

B. History of Community

The Upper Cape Towns of Sandwich, Barnstable and Yarmouth were incorporated by 1639. The “Pamet Lands”, including the Outer Cape Towns of Orleans, Eastham, Wellfleet, Truro and Provincetown were purchased in 1644 and incorporated as Nauset in 1646. The territory in between these towns included Indian land and part of the land known as “Purchases or Old Comers Reserve”. John Wing appears to have been the first settler in this new territory in 1658 in what is now Brewster. In 1667, an Indian Chief gave John Mecoy a thirty-six acre parcel of land in what is now Harwich Center. Gershom Hall, the first white man to reside in Harwich, settled on this land in 1668.

By 1694, there were enough settlers in the territory to support a minister, this being a requirement for application for incorporation by the General Court of the Massachusetts Bay Colony.

This large tract of land, the largest in Barnstable County, remained intact until 1772, when the southeastern part was set off to Eastham. In 1803, after a bitter struggle, the north parish and the south parish separated into the Towns of Brewster and Harwich.

Today, Harwich encompasses 20.93 square miles of land area with 10.9 miles of tidal shoreline. It is located in the 10th Congressional District, The Plymouth, Cape and Islands State Senatorial District. With miles of rivers and marshes and a coastline of sandy beaches dotted with the Town’s four picturesque harbors, Harwich has the unique ability to provide every form of aquatic activity available: quiet canoeing and kayaking through the great marshes or the Herring River, water skiing on Long Pond, deep sea fishing out of the harbors, fly fishing in several of the smaller ponds, or swimming and sunbathing on the sandy Nantucket Sound and Pleasant Bay beaches.

Harwich has been fortunate to have had the foresight to maintain public access to all of these activities. However, with the demand for private ownership that comes with rapid

growth the Town must strive to continue to plan ahead, expand ownership and increase the access to these amenities to insure availability to future generations.

1. State Register of Historic Places

The Captain James Berry house in West Harwich and the South Harwich Methodist Church were added to the State Register of Historic Places in 1986.

2. Existing Historic District

The Harwich Center Historic District was designated as such by the Town in 1973 and added to the State Register of Historic Places in 1975.

3. Historic Resources Inventory/Survey

The Harwich Historical Commission, with the help of an architectural/cultural history consultant, from 1992-1993, conducted an historic resources survey for the Town of Harwich. The historic survey accomplished several goals: identified approximately 250 structures constructed before 1940 (this number is probably a quarter of the amount that was built during that time); provided an important historical record of community resources; helped to raise public appreciation and understanding of local historic properties and sites; formed the basis for actions that the Historical Commission, the Planning Board, and other town bodies undertake; alerted local government officials that historic properties are a legitimate area of concern; and provided the ground work for the development of a preservation plan for the Town.

4. Inventory of Prehistoric or Archaeological Resources

An archaeological survey of the Pleasant Bay area was completed in 1987 and considered seventy archaeological sites in that estuary system. Harwich was identified as potentially being home to several sites in areas such as the Herring River and Muddy Creek. Fresh water areas were an important focus of prehistoric civilizations.

5. Scenic Landscapes

Harwich has many different types of scenic landscapes, which include;

- * almost eleven miles of tidal shoreline along Nantucket Sound and Pleasant Bay;
- * four harbors, where Round Cove is the only naturally occurring one and Wychmere, Allen's and Saquatucket were once pond and/or marsh areas dredged out to the sound to provide protection for sea vessels;
- * many bogs which are scattered throughout Harwich providing year-round scenic enjoyment;
- * twenty-two freshwater ponds and two reservoirs;
- * two scenic river corridors: Herring River and Muddy Creek; and
- * over 320 acres of forests, water and wetland in the Bells Neck Road/Salt Marsh/Reservoir Area.

Through purchases using Cape Cod Land Bank and Community Preservation Act funds, the Town has been able to acquire additional scenic landscapes including several cranberry bogs and significant areas of undeveloped pond frontage.

6. Culturally Significant Landscapes

Each of Harwich's seven villages contains culturally significant landscapes involving historic village centers, churches, scenic roads and other parts of the built environment. Many of these resources are described in the village hearings held during the preparation of the previous Open Space and Recreation Plan (Appendix A).

C. Population Characteristics

1. Size

Harwich experienced rapid population growth between 1960 (3,725 population) and 2000 (12,386 population) according to the US Decennial Census data. The rate of growth has slowed from a 58% increase in population between 1960 and 1970 to a 21% increase between 1990 and 2000 and an almost level population in the 2000s.

2. Distribution and Density

For voting purposes, the Town is divided into 4 precincts. Precinct 1 is made up of all of West Harwich and parts of Harwich Port and Harwich Center. Precinct 2 includes all of South Harwich and a portion of Harwich Port. Precinct 3 includes most of East Harwich and Pleasant Lake. Precinct 4 includes most of North Harwich, and portions of Pleasant Lake and Harwich Center. Populations for the precincts are as follows (from 2008 Town of Harwich Census):

Precinct 1: 2,961

Precinct 2: 2,938

Precinct 3: 3,361

Precinct 4: 2,963

The highest level of year-round occupancy has historically occurred in North Harwich, while Pleasant Lake, East Harwich and Harwich Center areas are also predominantly year-round occupancy. Density for the Town of Harwich is 563 persons per square mile or .91 persons per acre. Regions within the Town have widely differing densities: West Harwich and portions of Harwich Port contain older waterfront neighborhoods with dwellings on lots of less than 5,000 square feet, while parts of North Harwich contain dwellings on lots of several acres.

3. Age/Sex Composition

Harwich, like much of Cape Cod, has a higher than average share of residents over 65. Nationally, 12.4% of the population fell into this age group in 2000; in Harwich they represented 29.6% of the Town's population. Residents aged 5 to 34 made up a slightly lower share than in the US as a whole. According to the 2000 census, the average age of Harwich residents was 48.8 years; the median age in the US was 35.3 years old.

4. "Environmental Justice" Population

The Massachusetts Office of Energy and Environmental Affairs lists two "Environmental Justice" census blocks in Harwich. Environmental Justice populations are those deemed to be most at risk of being unaware of or unable to participate in environmental decision-making or to gain access to state environmental resources. In Harwich, the two identified

census blocks qualify for designation as Environmental Justice areas because they have a median annual household income at or below 65% of the statewide median income.

The two Harwich Environmental Justice areas constitute much of Harwich Port and the land between Harwich Port and Harwich Center (see Figure 2). While average income may be low, property values in Harwich Port are well above state and county averages. The area is characterized by an older population with an average age of 58, well above other parts of town, the county and the state. Fortunately, for the many elderly residents who rely on retirement rather than earned income, property taxes are relatively low. Most homeowners are able to continue living in their homes despite very modest incomes. Older residents who rent their homes benefit from the availability of several single-family and multi-family projects in Harwich Port and Harwich Center.

Environmental Justice areas in Harwich do not suffer for lack of access to environmental resources. Beaches and harbors are within a short walking distance. Walking trails and natural areas are plentiful in the immediate vicinity. Residents have full access to environmental decision-making in town, and many town board members reside within the two Environmental Justice areas.

5. Economy

Fifty-three percent of Harwich residents are in the labor force; nationally 64% of the population is in the labor force and 66% of Massachusetts residents are in the labor force. Of those within the labor force, more parents with children under six are both working in Harwich (65%) than in the state (61%) and nationally (59%). A greater share of Harwich residents are working in leisure related industries than nationally but the share of professionals among the residents is essentially the same as in the US (33.1% vs. 33.6%); it is likely that most of these professionals work within the educational health and social services sector which employs a larger share of the resident workforce in Harwich than it does nationally.

a. Resource Based Industries

Cranberry Farming

Approximately 200 acres of bogs in Harwich are depicted in Figure 13, “Open Space Inventory”. However, several of these bogs, such as the “Bank Street Bogs”, are no longer being used for growing cranberries. The cranberry-growing industry suffered from a 1999 price collapse, but activity has increased in recent years. Statewide, the average yield in 2008 was 182 barrels per acre at an average price of \$57.60 per barrel.

Fishing/Shell-fishing

There has been a recent decline in the number of active year-round fishermen. Regulation changes to increase fish populations have made it more difficult for fishermen to make a living. The total value of fish and shellfish landed in Harwich declined from \$2.2 million in 2005 to \$1.2 million in 2007.

The Town has actively encouraged shellfish activity in recent years. The Town began rearing shellfish in its Wychmere Harbor Shellfish Laboratory in 1994 and has grown 26.7 million quahog seed since then. In 2007 shellfish from the lab were seeded in Herring River, Allen Harbor, Wychmere Harbor, Saquatucket Harbor, Pleasant Bay/Muddy Creek, and Round Cove. Family harvests in 2007 yielded an estimated 646 bushels of quahogs, 30 bushels of oysters and 277 bushels of softshells.

b. Income and Employment

According to the US Decennial Census of 2000, Harwich had a median income of \$41,552 per year. This is low relative to the state (\$50,502) but very close to the median income nationally (\$41,994). Harwich has a greater share of its population with incomes between \$15,000 and \$75,000 per year than the state and nation. Among the residents of Harwich, 1.3% has an income of or greater than \$200,000/year. Nationally this group is 2.4% of the population, and in the state it is 3.5% of the population. Nationally and in Massachusetts most (approximately 80%) income is derived from earnings from work. In Harwich only 67.4% of the residents derive their income from earnings while 45% derive their income from Social Security. Three out of five households in Harwich rely on retirement income.

Fifty-three percent of Harwich residents are in the labor force. Nationally 64% of the population is in the labor force and 66% of Massachusetts residents are in the labor force. Of those within the labor force, more parents with children under six are both working in Harwich (65%) than in the state (61%) and nationally (59%). A greater share of Harwich residents are working in leisure related industries than nationally but the share of professionals among the residents is essentially the same as in the US (33.1% vs. 33.6%); it is likely that most of these professionals work within the educational health and social services sector which employs a larger share of the resident workforce in Harwich than it does nationally.

Because of the ever-increasing retirement population, number of seasonal residents, and influx of tourists to the Cape and Harwich; and, also the economic standing of the Town, it appears that there would be opportunities to encourage new business, including environmental sensitive tourism. New business opportunities should create jobs, enhance the tax base, promote a cleaner environment, and enhance the Town's/Cape's assets. Tourism in the off-season could be better promoted because of the relaxed pace, absence of traffic, dining and lodging values, proximity to large metropolitan areas, and year-round attractions and events.

Potential business which would boost the economy include: marine science facilities, environmental technology, aquaculture, greenhouse agriculture, and industrial parks with clean, light industry. The Town should promote its many natural features and man-made amenities and demonstrate its willingness to protect, preserve, and enhance those assets.

D. Growth and Development Patterns

1. Patterns and Trends

As Section B demonstrated, Harwich developed as a coastal town where farming, fishing and whaling were the main industries until the latter part of the 19th century. Village centers tended to spring up along the shoreline, where commercial businesses and residences mixed.

After the railroad made its way to the Lower Cape area, hotels were built to bring the many tourists who were escaping the ever-growing urbanized areas for the tranquility of the seashore. Tourism is now the main industry on Cape Cod and in Harwich. Businesses which cater to tourists are found in most all village centers in all towns in Barnstable County.

This section describes existing patterns of development and discusses how regulatory controls and development pressures may affect how the character of Harwich changes as it approaches build-out.

a. Local Land Use Controls

Zoning was first adopted by Harwich Town Meeting in 1951. The original Zoning Bylaw established a minimum lot size of 7,500 square feet for a dwelling which was subsequently amended to 10,000 feet in 1959, and 15,000 square feet by 1967. The minimum frontage requirement was seventy-five feet until it was changed to 100 feet in 1971.

The original bylaw facilitated the basic land use patterns in place today; Commercial along Route 28, 200 feet either side of the highway, and the remainder residential and agricultural. It remained unchanged until 1964 when it was amended to include a Conservancy District which was a predecessor to the Wetlands Protection Act (non-zoning). Other amendments between 1966 and 1970 created the Highway and Shopping District which is today's CH-2 Zone at Routes 137 and 39, Industrial Districts and Extensive Commercial Districts which are portions of today's IL Zones along Great Western Road and Queen Anne Road.

As of May, 1988, the minimum required area for single-family purposes anywhere in Town became 40,000 square feet and a minimum required frontage was 150 feet. Any new lots created after that date must contain at least 40,000 square feet and 150 feet of frontage in order to accommodate a single-family dwelling. Lots in existence prior to that date may be buildable if they were lawfully created, and meet the minimum area (and frontage) requirements of the Zoning Bylaw in effect at the time of layout.

b. Existing Zoning Districts

The Town of Harwich is divided into thirteen zoning districts, which are designated as follows:

Residential – Rural Estate	R-R
Residential – Low Density	R-L
Residential – Medium Density	R-M
Residential – High Density 1	R-H-1
Residential – High Density 4	R-H-3
Commercial – Village	C-V
Commercial – Highway 1	C-H-1
Commercial – Highway 2	C-H-2
Industrial – Limited	I-L
Multi-Family Residential – Low Density	M-R-L
Multi-Family Residential – Low Density 1	M-R-L-1
Drinking Water Resource Protection District	W-R
Personal Wireless Service Overlay District	P-W-S
Elderly Affordable Housing	E-A-H

Figure 3 indicates the current zoning district designations.

c. Developed Land Characteristics and Potential of Vacant Land

The 2000 Harwich Local Comprehensive Plan (LCP) discusses the potential for additional growth in Harwich in the Land Use/Growth Management chapter. Based on build-out results from the October 2000 EOEa Build Out study conducted by the county for Harwich, there is the potential for 2,780 new residential dwelling units on the residentially zoned lots that remained undeveloped at the time of the analysis. That potential, together with the increase in traffic volume anticipated by the increase in residences, led to the recommendation in the LCP that the acquisition of open space could reduce the potential impact on town services and town roads.

The Land Use/Growth Management chapter of the 2000 LCP also states that the quality of life and economy in Harwich are closely tied to the quality of the natural environment. The chapter states that water quality protection is one of the significant resource concerns:

“The quality of the Town’s drinking water and its recreational waters and wetlands depends on effective management strategies as more people inhabit the Town and as more year-round occupancy occurs. Since we have largely inherited the development patterns that continue to threaten these resources, the solution lies in reducing future development potential and mitigating the pollution impacts of existing land uses.”

In addition,

“Environmentally sensitive areas are known and mapped and must be part of an aggressive and strategic land protection program before development further destabilizes the natural balance of the Town’s water resources. Other unique habitats must also be included in this approach. In addition, the findings of the

Priority Land Acquisition Assessment Project, June 1999, prepared by the Cape Cod Commission, indicate a need to secure certain strategic lands in Harwich for future water supply.”

Figure 4 depicts all existing land use in Harwich by State Code for residential, commercial, industrial, agricultural, recreational, and government categories.

d. Analysis of Select Land Use Data: Residential

Nearly seventy percent of all existing single-family units were on parcels containing less than half an acre in 2000. Only three percent of these were on conforming lots of 40,000 square feet or more. Highest residential densities were concentrated in the southern half of Town, near business centers and water access. The northern half of Town contains most of the larger vacant parcels. One unit per acre was found to be the maximum acceptable density to protect the drinking water supply. Unsubdivided areas are now zoned for roughly one acre lots. There were 2,200 vacant (nearly all buildable) residential parcels town-wide in 2000. By 2003, approximately 1,500 vacant parcels, .25 acre (10,000 square feet) and greater, existed in Harwich. 2006 Harwich Assessors data indicates that there are now 935 acres, or 673 parcels of residentially zoned developable land. See Figure 5 for an illustration of parcels in town with development potential, including “partially developed” parcels (residential properties on 3 or more acres) and parcels with “unknown owners”. This figure should be considered only a rough approximation of development potential. Actual development based on land capacity, owner preferences and future zoning changes may vary.

More than half of existing built upon parcels are substandard lots, in areas of existing high densities. Density differentials have produced a variety of different neighborhoods. High densities may impact: Pleasant Bay Area of Critical Environmental Concern, John Joseph’s Pond, Buck’s Pond, Hinckley’s Pond, Herring River, West Reservoir, Sand Pond, Grass Pond, Allen’s, Wychmere, and Saquatucket Harbors, Skinequit Pond, Red River, and the immediate shoreline of Nantucket Sound.

e. Seasonal Residential Uses

More than forty-five percent (45%) of dwellings in Harwich are occupied on a seasonal basis. The highest concentrations of such residences are in West Harwich, Harwich Port and South Harwich. A recent review of building permits indicated that three seasonal units were approved for every one year-round residence. While many recent permits were issued for seasonal use, there also is an expected trend towards conversion of seasonal units to year-round use. The “2008 Survey of Cape Cod Second Home Owners” by the UMass Donahue Institute found that 25% of second homeowners on the lower cape intend to convert their home to their primary residence within the next 15 years.

f. Land Use Compatibility

Generally residential uses are compatibly oriented relative to non-residential uses. North Harwich Industrial Zone, west of Depot Street, if developed as zoned, would impact significantly on adjoining residential uses. Industrial growth at Headwaters Drive and

Route 124 and along Queen Anne Road could create visual impacts and threaten the quality of life in these areas. Residential uses on the north side of Old Colony Road would be impacted by commercial development of the south side frontage of that road, as current zoning would permit. Several cases of non-conforming, non-residential uses in residential zones exist throughout the Town; some producing more conflict than others. Conflicts may arise as a result of expansions of these uses. Commercial/Residential buffering is currently inadequate. Depth of commercial parcels poses both a threat and opportunity. There is a need to create buffer/transition zones in these areas to ease the shift between residential, commercial and industrial zones. More protective standards appear warranted for institutional uses so as to properly protect adjoining residential uses. General compatibility exists along town boundaries and is expected to continue.

g. Near-Term Development Probability

According to 2006 Harwich Assessors data, there are not significant amounts of commercially and industrially zoned land left for new development. However, many parcels, residential, commercial and industrial have the potential to be developed and/or re-developed in all zones (see Figure 5 illustrating additional development potential on residential, commercial, industrial and owners unknown properties, and Table 1 from the 2000 Buildout Analysis).

Table 1 Additional Development Potential and Impacts

Developable Land Area (sq ft)	172,063,133
Developable Land Area (acres)	3950
Residential Lots/Dwellings	2780
Commercial/Industrial Buildable Floor Area (sq ft)	3,698,060
Residential Water Use (gpd)	256,705
Commercial/Industrial Water Use (gpd)	277,355
Municipal Solid waste (tons)	1755
New Students	525
New Roads (miles)	47

From EOEA Buildout 2000 for Harwich

h. Buildout Conclusions

The possibility of build-out development was of great concern to the Town's citizens. The Town of Harwich Local Comprehensive Plan, approved by Town Meeting voters in May of 2000, suggested the use of several key concepts to allow development to occur in Town without diminishing property owners' rights.

a. Adoption of a "no net change" philosophy in terms of ultimate population and commercial space potential. This philosophy reflects a desire by the Planning Board to achieve a win/win outcome for the Town and property owners such that the former can encourage the cooperation of the latter in achieving the Town's planning goals without placing an undue burden on property owners. This approach requires managing growth by shifting development pressure from sensitive to less sensitive areas through incentives and reasonable regulations.

- b. Recognition that change and growth are natural components of a healthy and vital community; that working with and managing such growth for the optimum benefit would be more appropriate than attempting to stop it; that maintaining and enhancing the tax base is an interest shared by every resident; and that overall property values are directly related to the quality of the Town's scenic, natural and cultural resources.
- c. Establishment of seven growth centers; four for mixed commercial and residential usage and three for industrial and other job-producing activities.
- d. Enhancing the village atmosphere of existing activity centers by allowing more residents to live near and help support area businesses.
- e. Guiding development pressure to the growth centers by allowing the transfer of development rights from outlying commercial and residential areas to certain growth centers. Such a shift of development activity would help relieve specific natural resources of the threats of excessive development activity. It will also help prevent the complete sprawl of residential and commercial development throughout the Town.
- f. Providing for adequate public facilities and amenities in the growth centers to aid their vitality as this would enhance their desirability as a destination.
- g. Providing realistic incentives for:
 - * Inclusion of affordable housing in new development and redevelopment.
 - * Design of new construction that is compatible with the existing character in each village, especially where historic resources are concentrated.
 - * Clustering of new residential development to preserve permanent open space and wildlife habitat.
 - * Transfer of development rights between two parcels

2. Infrastructure

Existing infrastructure in Harwich has influenced development patterns. The size and quality of roads, availability of bike paths and sidewalks, as well as the availability of public water and public sewers will continue to shape the character of the community, the density of development, and the quality of life.

a. Roads

There are approximately 430 miles of public and private, paved and unpaved roads in Harwich. The town is connected to neighboring towns and the region through two exits onto Route 6, and other roadways (Routes 28, 137, 124, and 39) that provide mobility to and within village centers and commercial areas. In addition to the local collector roads, there are many roads that have scenic and historic values that help define Harwich's character.

b. Bicycle Facilities

Bicycle travel through Harwich is facilitated by the entire road network, a segment of the Cape Cod Rail Trail and a Harwich spur. Bicycle traffic in Town is growing at a tremendous rate. Each summer, more and more residents and visitors of all ages explore

the Town and other parts of Cape Cod by bicycle. Commutation by bicycle is also growing in numbers.

Bicycle traffic on the Rail Trail, Harwich spur and Harwich roadways will most likely continue to increase with the growing population of bicyclists who want to save energy, reduce congestion, protect the environment, and tour Cape Cod.

From the transportation perspective, only the Rail Trail and Harwich spur provide adequate separation between bicycle and motorized vehicle traffic. In all other cases, bike traffic must mingle with cars and trucks on narrow roadways, some with no shoulder.

Ideally, bicycle traffic should be physically separated from the lanes for motorized traffic, when practical, or routed along roads with relatively low vehicular traffic volumes. In Harwich, only busy arterial and major collector roadways link areas of activity among the Town's seven villages. This condition, together with significant projected increases in motor vehicle traffic provide a formula for poor safety which would also discourage the use of the bicycle as an alternative to the car.

The Rail Trail in Harwich provides for exclusive passage of bicycles and pedestrians from the Dennis town line near Depot Street to the Brewster boundary at Seymour Pond. The Harwich spur connects to the Cape Cod Rail Trail on the west side of Harwich Center and continues east through Harwich Center and South Harwich to the Chatham line. Off-street parking for the Rail Trail exists on Headwaters Drive and at Hinckley's Pond and Route 124. Many people park in the lot behind Town Hall to access the spur. Informal parking occurs where the trail intersects with Town roads.

The Rail Trail and spur are outstanding recreational assets. Until the development of the spur, the Rail Trail did not provide any practical linkage between any villages in Harwich. Only Pleasant Lake has an establishment – a general store – that is complementary to bicycle travel and accessible off of the Rail Trail. The spur provides easy access to Harwich Center, and bicycles are often seen parked outside local stores. Even with the spur, no links exist between Harwich Center and any of the sound-side villages or the growth center in East Harwich. Safe bicycle links between villages would improve resident mobility, greatly enhance the environment for tourism, and help maintain village vitality.

c. Walking Facilities

i. Transportation Oriented Walking Facilities

Walking was by far the most popular recreation activity of Harwich residents as of 1997. Walkers can be seen on every roadway in Town, with or without sidewalks. A significant number of off-road trails also provide opportunities for recreational walking. 51% of respondents to the May 2009 survey expressed interest in investing in sidewalks and 37% supported expanding hiking trails.

As a mode of transportation, however, walking is constrained by the lack of safe facilities through and between activity centers in the Town. Only Harwich Center, Harwich Port, and West Harwich contain any significant sidewalk facilities, yet areas in the other four villages experience potentially hazardous pedestrian traffic on narrow or heavily traveled roadways.

Sidewalk needs include upgrade of existing facilities and construction of new facilities. In many locations, pedestrian and bicycle needs overlap. Appendix B lists priority projects that may include sidewalks and/or bicycle facilities.

In Harwich Center, town and school officials should evaluate the existing sidewalk network to determine if it is adequate to replace bussing as transportation for students within walking distance of the schools.

ii. Recreation Oriented Walking Facilities

Most villages have informal walking trails. The less developed areas, such as East Harwich, Pleasant Lake, Harwich Center and North Harwich have the most trails over public and private land. Over the last several years, as private land is developed, these informal trails are being lost. The Trails Committee has been marking and identifying walking trails, and in 2008 published a comprehensive trail guide available on the Harwich Conservation Trust website at www.harwichconservationtrust.org/Trail_Guide.html.

The abundant trail facilities offer opportunities for extended links and contact with high quality and varied wildlife and plant habitats as well as many scenic vistas. These features appear to be under-emphasized assets. Any protection or enhancement of wooded trails would be an investment in the Town's ability to draw visitors who appreciate a natural setting. The availability of good quality trails also tends to enhance the values of nearby real estate.

One obvious deficiency is the lack of linkage of natural areas by off-road foot and/or bridle trails. Another major problem is the lack of protection of trails traversing private property. There are no bylaw provisions in 2010 which promote the preservation of trail corridors when land is developed. Nor is there any clear delineation of which trails have proscriptive rights for public passage.

The most effective way to preserve trail corridors would be to acquire the land itself or an easement for public use. With appropriate regulatory amendments, trail continuity between parcels could be required of new development provided the preferred locations are clearly marked on a plan for trail facilities.

d. Public Transportation

Residents of Harwich have access to many different types of public transportation within the Town boundaries and in the surrounding towns. The ultimate problem is getting to these access locations.

i. Air Services

Air service is provided to and from the Cape by several local airports. Two of the closest to Harwich are the Chatham Municipal Airport and Barnstable Municipal Airport in Hyannis.

ii. Bus Service

The Cape Cod Regional Transit Authority (CCRTA) provides the “b-Bus” service, the “Flex,” and the Hyannis to Orleans (H2O) services in Harwich. The b-Bus is a seven-day-a-week, door-to-door bus service for trips of any purpose. Anyone can make an appointment by at least 4 p.m. the day before they need a ride, and by 4 p.m. on Friday for weekend and Monday service. The b-Bus picks up scheduled riders and takes them to and from their destinations. This service is also coordinated with medical trips to Boston hospitals.

The Flex bus serves the area between Harwich and Provincetown and has been operating since 2006. This service is unique as the bus follows a defined route, picking up and dropping off passengers at designated stops. The bus will also “flex” off its route (see <http://theflex.org/offroute.htm>). The driver will re-route the bus to locations within ¾ mile (see <http://theflex.org/routemaps.htm>) of its usual route when a passenger has made a reservation to do so (2 hours or more in advance).

The H2O runs, generally, along Route 28 between Hyannis and Orleans Monday to Saturday. The service is a traditional fixed route bus service with two designated stops in Harwich; Harwichport on Route 28 (near the Chamber of Commerce) and at the Harwich Shaws Market. The bus will also stop along the route if a patron flags them down.

iii. Taxi Service

Two taxi companies provide 24-hour door-to-door taxi service in Harwich and Dennis and to destinations all over Cape Cod and off-Cape.

iv. Ferry Service

Ferry service to Nantucket and Martha’s Vineyard is provided by two ferry companies in Hyannis, Woods Hole, and Falmouth. A ferry company operating out of Saquatucket Harbor provides service to Nantucket. This service has provided a boost to the Town’s economy.

v. Limousine Service

Two companies in Harwich provide limousine service to residents and visitors. One company noted that over ninety-five (95%) percent of their business comes from outside Harwich.

vi. Park & Ride

A Park & Ride lot is provided at the junction of Route 6 and Route 124 (at Exit 10) for those who carpool.. Considerable parking capacity was still available at this State-owned facility as of 2008. The Plymouth & Brockton bus to Boston is also at this location.

e. Public Water Supply

The Harwich Board of Water Commissioners and Harwich Water Department are responsible for maintaining, providing, conserving, and protecting the Town's water supply; installing and maintaining water mains, storage tanks, pumping stations, and other appurtenances; and organizing and implementing the flushing program.

The Board and Department maintain six well-fields which include 329 acres of land around Harwich. Three well-fields, Pleasant Bay, Puritan Lane, and Westgate Road, have no pumping stations, while the other three, Chatham Road, Holmes Forest, and Bay Road, have two or more. Another eighty acres in various locations are tank sites and open land.

f. Sewage/Septage Facilities

There is no public sewage system in the Town of Harwich.

The Harwich Board of Health and Harwich Health Department oversee the design, installation, and maintenance of private septic tanks. The Board of Health is the policy-making and enforcement body for these services.

The Town initiated the Harwich Comprehensive Wastewater Management Plan in 2007 with two bodies to manage the plan – (1) the Water Quality Task Force - Wastewater Management Subcommittee to oversee a consultant's work in developing the plan, and (2) a Citizens Advisory Committee to inform the Board of Selectmen and the public about wastewater issues.

IV. ENVIRONMENTAL INVENTORY AND ANALYSIS

A. Geology, Soils, and Topography

1. Geology

The peninsula of Cape Cod is a product of the ice sheets of the Pleistocene Epoch, a relatively insignificant fragment of geologic time which began approximately one million years ago and ended about 12,000 years ago. The physical features of Cape Cod are a result of depositional processes with the last advance and retreat of the ice sheets. Maximum glacial advance occurred between 18,000 and 25,000 years ago, and the ice front receded northward, probably off Cape Cod, about 15,000 years ago (U.S. Geological Survey, 1976). The predominant physical features are moraines and outwash plains. Two moraines, the Buzzards Bay Moraine trending southwest-northeast, and the Sandwich Moraine trending east-west, are identified by hills and depressions and are composed of till mixed with well-soiled and stratified sand, gravel, and silt. The Mashpee Outwash Plain, east and south of the Buzzards Bay and Sandwich Moraines, slopes southward to Nantucket Sound and stretches from Chatham in the east to Falmouth in the west. Harwich occupies part of this extensive plain. Nearly all of the material comprising this part of the plain consists of stratified sand and gravel deposited by streams of glacial melt-water; individual particles are quite rounded, the result of abrasion as the material was transported by these streams. In parts of Harwich, outwash deposits overlay moraine deposits.

Elevations are highest in the northeastern section where they reach to about 100 feet north of Pleasant Bay Road. From here, the plain slopes generally toward the south and west, with elevations of about fifty to sixty feet in the northwestern part of the Town and near sea level along the southern shoreline. The amount of gravel and its coarseness increases from west to east. It is thus inferred that the part of the plain occupied by Harwich was constructed from materials transported from a source to the northeast.

Among the more prominent features of the landscape are a series of ice-block or kettle hole ponds, both large and small. Blocks of ice which broke from the main body of the glacier during its retreat became stranded and partly buried in the sands and gravel deposited from shallow, many-branched and abrading streams of glacial melt-water. As the ice blocks melted, cavities in the plain surface resulted. The elevation of a pond's surface indicates the approximate elevation of the local water table, or surface of the underground saturated zone. Pond elevations decrease from about thirty feet along the northern part of Town to sea level along the shore, where Wychmere Harbor and Allen's Harbor occupy ice block holes formed at elevations below sea level. Smaller ice blocks became buried in the outwash sands, and upon melting, caused the land surface to slump, thus forming the numerous potholes or kettle holes dotting the landscape.

Narrow, steep sided outwash channels or furrows that trend in a southwesterly direction are believed to have been formed during late glacial time when the deposits were subject to permafrost conditions. Some of the channels presently hold streams, such as Herring

River, fed by Hinckley's, Long and Seymour Ponds. Other channels are now dry, such as that below Buck's Pond between Chatham and Orleans Roads.

Recent changes in the landscape have not been extensive. The shoreline has been smoothed and eroded by the action of waves and currents. Silt and clay have been deposited in low areas of marshes subject to tidal flooding and organic matter has accumulated in the marshes and in the bottoms of kettle holes that were at or below the water table.

2. Soils

The following section describes the General Soils Associations found in the Town of Harwich.

a. Carver Soils on Level to Moderate Slopes

This general soil area occupies about seventy percent of Harwich. An extensive tract occupies the southern part of the Town and smaller tracts are scattered throughout the Town. Carver soils have a coarse sand surface that is underlain by deep deposits of coarse sand that contains streaks of gravel mostly quartz and feldspar grains with very few dark minerals present. The 0 – 15% slope Carver coarse sand is generally suitable for development.

b. Cranberry Bog – Tidal Marsh Association

This general soil area occupies about fifteen percent of Harwich. Most is found in the southern part of the Town where there are extensive areas of marsh and cranberry bogs. Smaller tracts occupy drainage-ways and sites adjacent to ponds. About sixty percent of the association is made up of cranberry bog, twenty-five percent is tidal marsh and the balance is made up of an assortment of sandy mineral soils that are water saturated for extended periods of time. Cranberry bogs are areas where about a foot of sand has been added to the surface of the original organic soils. The composition of tidal marshes vary greatly, but may have a thick organic surface layer.

c. Carver Soils on Moderately Steep to Very Steep Slopes

This general soil area occupies about fifteen percent of Harwich. Tracts are scattered throughout the northern two-thirds of the Town. Carver soils have a coarse sand surface that is underlain by deep deposits of coarse sand, pebbly in many places and containing a few cobblestones in some places. There are few dark weatherable minerals in the Carver soil material.

See Figure 6 for delineation of Harwich soils.

3. Topography

The 1967 Master Plan describes the town's topography:

“The terrain is fairly level in the southern portion of the Town along Nantucket Sound, rising to elevations of 15 to 20 feet m.s.l. on the western and central portions of Route 28. The central and northern portions of the Town contain several rolling hills with elevations of 70 to 80 feet m.s.l. but in general, land in these areas lies between elevation of 50 to 60 feet.”

The same hold true today, except that several large sand pit parcels have large depressions within them following extensive soil removal activity.

B. Landscape Character

When viewed from the air, one can see the large areas still available for recreation in the Town of Harwich. Dotted by sixty three ponds, large and small; acres of cranberry bogs; miles of rivers and marshes; a coastline of sandy beaches and three picturesque harbors on the south side and Round Cove to the east, Harwich enjoys the ability to provide every form of aquatic activity available.

In addition, Harwich hosts Hawksnest State Park, the Cape Cod Rail Trail, town forests, and acres of town conserved and privately conserved open space, which together with freshwater and saltwater wetland systems, buffers to cranberry bogs and other undeveloped lands, and water district properties, create an extensive network of wooded or naturally vegetated landscapes.

Harwich has been fortunate to have had the foresight to maintain public access to many of these resources. However, as development pressures continue, bringing with them the demand for private land ownership, the Town must continue to plan ahead, expand public landholdings to maintain the town’s rural character, and increase access to these amenities to insure availability to future generations.

C. Water Resource Protection

The Town of Harwich faces many of the same challenges that Cape Cod faces as a region, many of which relate to water-quality. The protection of open space in watersheds that drain to sensitive water resources is one tool that Harwich has implemented with a measured level of success. Un-development of built-up areas and protection of pristine areas are effective tools for eliminating and averting water-quality impacts in sensitive watersheds stemming from wastewater discharges, stormwater runoff, and hazardous materials & wastes resulting from land-use development.

1. Connecting Open Space to Sensitive Water Resources

Discrete geographic areas that drain to surface-water bodies or water-supply wells comprise Cape Cod’s watersheds. The Cape’s watersheds are influenced by the region’s geology which is characterized by highly permeable soils, high infiltration rates and minimal over-land runoff. In the absence of appreciable surface runoff, the watersheds

are defined by groundwater flow paths influenced by streams, ponds and estuaries into which groundwater discharges.

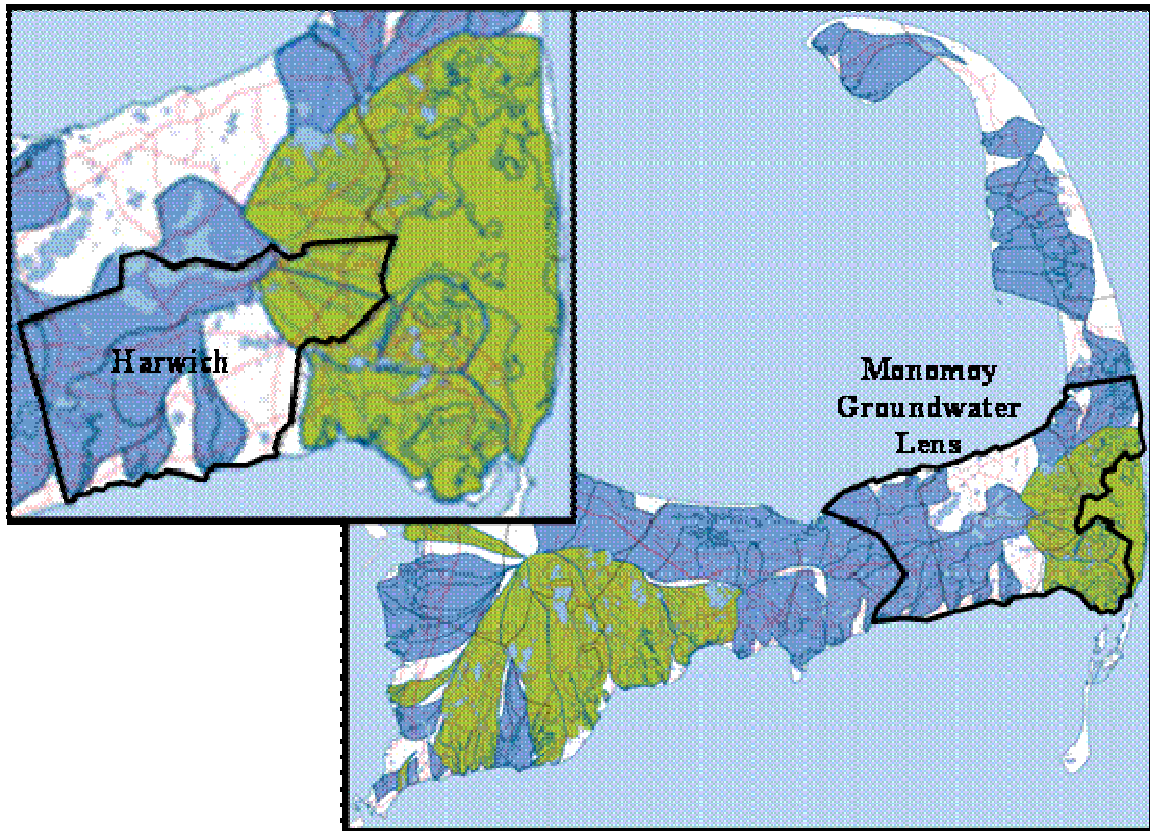


Figure 7: Cape Cod watersheds from Regional Policy Plan Water Resources Classification Map II. The map integrates MEP-delineated watersheds (green) and interim watersheds delineated by the Cape Cod Commission (blue) pending finalized MEP watersheds. Watersheds that discharge to open ocean are shown in white.

The Cape's watersheds are being mapped by the Massachusetts Estuaries Project (MEP), which is evaluating the ability of Cape Cod's estuaries and marine embayments to assimilate nitrogen loads from their watersheds. Watersheds that have been delineated under the MEP, together with target watershed-nitrogen loads, are available to the public at <http://www.oceanscience.net/estuaries/reports.htm>.

Watersheds in the Town of Harwich are confined to the Monomoy groundwater lens (Figure 7). The Monomoy lens, one of six groundwater lenses that comprise the greater Cape Cod aquifer, is a unit of fresh water stored in pore spaces of the glacial deposits to which Cape Cod owes its existence (Figure 8). The lens, derived from precipitation and buoyed above denser saline groundwater, flows and discharges to coastal waters that comprise the lens' boundaries: Cape Cod Bay, the Bass River in Dennis, Nantucket Sound, Pleasant Bay, Nauset Beach, Town Cove and Rock Harbor.

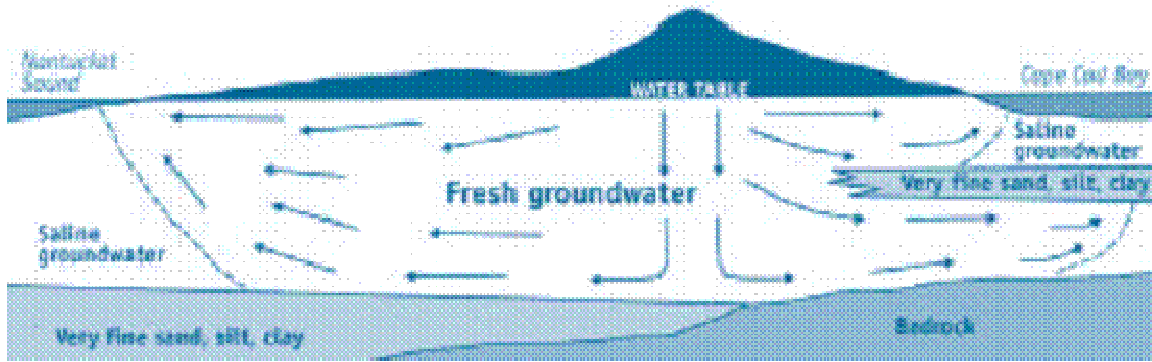


Figure 8: Hydrogeologic cross-section of the Monomoy Groundwater Lens modified from USGS Hydrologic Atlas HA-692, 1986 (vertical exaggeration x10).

Some Monomoy watersheds transcend town boundaries such that land uses in shared watersheds affect water quality in neighboring towns. For example, groundwater beneath the Town of Brewster discharges to Long Pond and ultimately drains to Hinckleys Pond and the Herring River system in Harwich. Similarly, groundwater originating in Harwich ultimately discharges to the Swan River in Dennis and to the Monomoy River (Muddy Creek) which is shared with the Town of Chatham. In this way, activities and development occurring in one town affect water quality in another and may require regional solutions. For example, cooperative discussions are being undertaken by the Towns of Harwich and Chatham to jointly address impaired water quality in the Monomoy River.

2. Effects of Land Use on Water Quality and the Role of Open Space Protection

Open space protection, when implemented in conjunction with other tools such as wastewater, stormwater and educational solutions, offers an important tool for restricting development in sensitive water-resource areas and preserving natural aquifer-recharge areas. Land-use development that generates wastewater, fertilizers and runoff from de-vegetated and paved areas increases contaminant loads to groundwater. Water-quality impacts vary depending on the source and nature of the contaminant loads and the receiving waters.

a. Drinking Water

Open-space protection in areas that contribute to Cape Cod's public drinking-water supplies has played an important role in assuring the availability of safe drinking water. The Federal designation of Cape Cod's aquifer as a Sole Source Aquifer underscores the aquifer's importance as the region's only source of drinking water. The Cape Cod Aquifer has required extensive management as a drinking-water source because it also receives wastewater discharges, primarily from individual on-site septic systems distributed across the Cape, stormwater runoff, pesticides, excess fertilizers that leach to the water table, and occasional spills of hazardous materials. Communities across the Cape have initiated and implemented effective wellhead protection strategies and regulations that have generally achieved an acceptable level of drinking-water protection. Important components of this effort include State, regional and local regulations that restrict land uses in Zone II wellhead protection areas (Figure 9), some of which

transcend municipal boundaries. The State's Source Water Assessment and Protection ([SWAP](#)) report for Harwich's water supply identifies potential sources of contamination, including sources in neighboring towns.

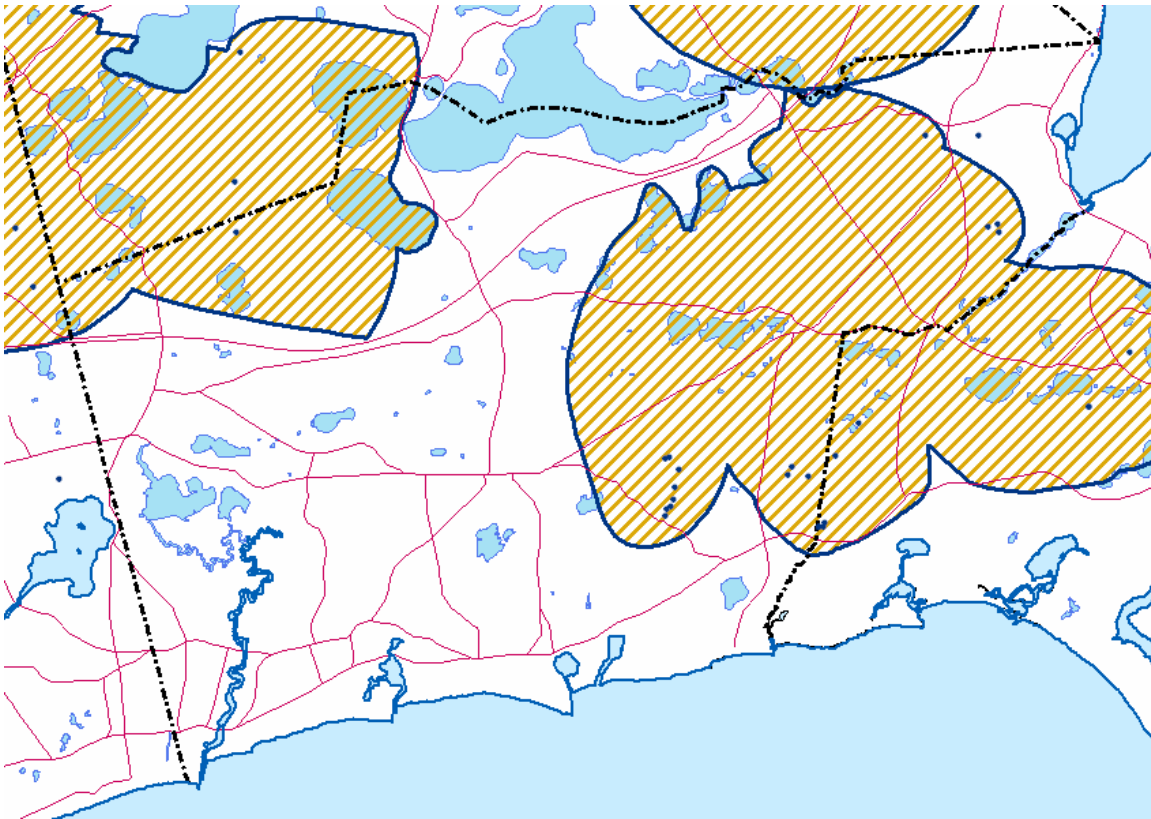


Figure 9: Zone II Wellhead Protection Areas (orange) in the town of Harwich and neighboring communities.

The [Harwich Water Department](#) pumped 768 million gallons of water from the Monomoy lens in 2007 to supply approximately 9,700 accounts (2006). The influx of vacationers to Cape Cod during the summer season roughly doubles the volume of water that is pumped relative to the off-season. The Monomoy Capacity Study prepared by the Cape Cod Commission in 1996 evaluated the amount of development that the Monomoy Lens can accommodate while continuing to protect drinking-water quality. In addition to projecting a significant summer water-supply deficit at buildout that would need to be addressed with new public sources, the study also anticipated that nitrogen-loading concentrations in contributing areas for public water supplies could exceed the regional goal of 5 milligrams-N per liter with an increase in year-round home conversions. The State has established a 10 mg-N/L limit for nitrate-nitrogen in drinking water in recognition that elevated concentrations of nitrate in drinking water may result in methemoglobinemia, or blue-baby syndrome, a condition that inhibits the uptake of blood-oxygen. Elevated concentrations of nitrogen in groundwater often indicate general water-quality impairment from land-use development. Drinking-water standards have not been promulgated for emerging contaminants such as pharmaceuticals and personal-care products (PPCPs) being released to the environment in treated wastewater.

The Town of Harwich has added **one new well** to its inventory since 1996. A survey of second home owners published by the Commission in 2009 indicates that 22% of respondents expect to convert their seasonal homes to their primary residence within the next fifteen years. The Monomoy study evaluated the option for towns to purchase developable residential properties as one of many tools to protect drinking-water quality. More recently, regional incentives have been created for increased development densities outside sensitive watersheds, where adequate wastewater and stormwater infrastructure is provided, balanced by incentives elsewhere for redevelopment, un-development and open-space preservation.

b. Ponds & Lakes

The [Cape Cod Pond and Lake Atlas](#) (2003, Cape Cod Commission) catalogues 63 ponds in the Town of Harwich, 20 of which are great ponds exceeding 10 acres. Table 2 inventories some of the ponds by name, size in acres, amount of accessible area, and the facilities available at each.

Pond Name	Size (acres)	Access (acres)	Facilities
Long Pond	743	99	2 boat ramps, picnic area, swimming, fishing
Sand Pond	27	114	dock, parking, recreational facilities
Hinckley's Pond	171	28	parking, swimming
Bucks Pond	29	25	skating, swimming, boat ramp
John Joseph's Pond	19	25	skating, swimming, boat ramp
Flax Pond	15		
Seymour Pond	181	02	hunting, fishing; although warm water fish population and access is available, pond is not heavily fished; public beach (3 pkg. sp.); surrounding low swamp area has high wildlife potential, low vegetation offers shelter and food to both waterfowl and upland game.
Robbins Pond	28	None	hunting, fishing; high wildlife potential; varied vegetation offers shelter and food attracting both waterfowl and upland game; ideal spawning area for alewives.
Island Pond	4.5±	Yes	no public facilities
Walkers Pond	25	Yes	
Aunt Edies Pond	21	None	fishing; private land
Grass Pond	23	5	5 acres Conservation Land; eel ramp
Skinequit Pond	15		6 acres bog; 2 acres upland; Conservation Area; herring/alewife run
Cahoon Pond	29		
Mud Pond	7	None	private

Olivers Pond	13	Yes	D.E.M.; perch fishing; duck hunting
Hawksnest Pond	30	Yes	D.E.M.; fishing; bird watching
Paddocks Pond	7	Yes	private; fishing; duck/geese breeding and migratory area.
West Reservoir	100±	Yes	Conservation Commission; boating; bird watching; fishing; jogging roads; bridle paths; most popular in town.
East Reservoir	25±	Yes	Conservation Commission; same as West Reservoir
Andrews	6		Conservation Commission; same as West Reservoir
Cornelius Pond	16	yes	private; no public activities
Mill Pond	10	yes	private; no public activities
Black Pond	9	limited	D.E.M.; no public activities; some trapping; hunting

Table 2: Select Ponds in Harwich

Pond and Lake Water Quality Considerations

Open space protection is important to water-quality in fresh surface waters because these waters are particularly vulnerable to development along their up-gradient shorelines. In 2001, water samples were collected from 12 of these ponds under the regional Pond and Lake Stewards (PALS) program so that the general health of Cape ponds could be evaluated. A key recommendation of the study is for Cape Cod towns to initiate summer pond sampling programs to complement existing water-quality information and to influence future funding priorities. The Harwich Shellfish and Marine Water Quality Committee, the Long Pond Watershed Association, and the Great Sand Lakes Association continue to be involved in this effort.

Of the twelve Harwich ponds that were evaluated in the Cape Cod Pond and Lake Atlas, Walkers Pond was the only pond that was shown to be relatively un-impacted. The Evaluation of Wastewater Management Options for Fresh Water Ponds www.capekeepers.org/images/educ_materials/wwreports/Great_Sands_Lake.pdf prepared for the Town of Harwich in 2007 under a Barnstable County grant describes updated water-quality information for Harwich's Great Sand Lakes, practical and engineered prescriptions for improving water quality in these ponds, and the potential for the ponds to naturally reduce nitrogen loads from areas contributing to Harwich and Chatham drinking-water supplies. Excess phosphorus loads from land-use development tend to impact fresh surface-water quality because ponds and lakes tend to be phosphorus limited, i.e. small additions of phosphorus to ponds and lakes, relative to other nutrients such as nitrogen, will have adverse effects on water quality. In recognition that phosphorus binds to aquifer sediments, development setbacks from ponds and lakes can be an important management tool for preventing and mitigating eutrophication (excessive growth) in ponds and lakes. Open-space protection along up-gradient pond and lake shorelines can ensure that these setbacks are established and maintained.

In 2007, the Towns of Harwich and Brewster undertook a major alum treatment to rehabilitate water quality in Long Pond. The project was an in-lake ‘solution’ with the goal of neutralizing internal nutrient sources already in the pond sediments, as opposed to external watershed sources such as wastewater, fertilizer and stormwater runoff. Comprehensive management of existing watershed-nutrient loads and prevention of potential future loads through conservation restrictions should be undertaken to address these external phosphorus sources and avert costly future in-lake treatments. The [Harwich Conservation Trust](#) has contributed to this mission through the Priority Ponds Project under the Trust’s Save Land – Save Water Initiative, which provides landowners with land-conservation options protective of pond and lake water quality and wildlife habitat. The Trust has purchased properties and holds conservation restrictions on private holdings, which have effectively averted potential future nutrient loads.

c. Coastal Waters

The Town contains five estuary systems, three embayments and four miles of shoreline on Nantucket Sound.

An estuary is the area around the mouth of a freshwater stream or river where it meets salt water. An estuary can take the form of a wide marsh or an enclosed harbor. There are five estuary systems in Harwich:

Herring River
Red River
Allen’s Harbor
Saquatucket Harbor
Muddy Creek (Monomoy River)

Salt water embayments are water bodies which are surrounded by land except for a channel area through which tidal waters flow. There are two such water bodies in Harwich; Wychmere Harbor and Round Cove. Shellfishing is often prohibited in both water bodies from April/May through November.

In addition, Harwich shares shoreline and contributing watershed area with Orleans and Chatham to a large embayment, Pleasant Bay. The Bay has historically been a very productive resource for finfish and shellfish. Since the breach of the North Beach barrier beach in Chatham in 2007, the tidal flushing action in the Bay has become more aggressive, leading to even healthier conditions. The fine quality of the Bay’s ecosystem qualified it for designation as an Area of Critical Environmental Concern (ACEC) which requires rigorous scrutiny of new construction, alterations, filling, and dredging projects in or around the Bay below ten foot above mean sea level. The changes in water quality resulting from the breach are still being studied.

A private organization called the Friends of Pleasant Bay, in concert with Town Health Officers and other environmental professionals, is initiating a study of the sources of

contaminants entering Pleasant Bay from the land well above the ACEC limits. Results from the study may indicate actions the town can take to further mitigate impacts to the Bay.

Coastal Water Quality Considerations

Land-use development increases nitrogen loads to coastal waters where, unlike phosphorus, nitrogen is efficiently transported by groundwater, through Cape Cod's sandy aquifer, to coastal waters where nitrogen is typically the limiting nutrient. Work conducted by the MEP shows that a limited amount of nitrogen is removed from groundwater as it passes through wetlands and surface-water bodies. However, *existing* nitrogen loads being transported to Cape Cod's coastal waters generally exceed critical nitrogen thresholds determined by the MEP and excessive algal growth and loss of faunal habitat are being observed in coastal waters for which critical limits have not yet been determined by the MEP.

Open space protection and conservation will not mitigate existing nitrogen loads unless it is accompanied by un-development. Existing wastewater discharges, primarily from septic systems compliant with Title-5 regulations, comprise the single largest source of excess nitrogen entering Cape Cod's coastal waters. In addition to excess nitrogen loads, elevated bacteria counts resulting from failed Title-5 septic systems and inadequate stormwater infrastructure force the closure of shellfish beds. Cape Cod is increasingly looking to comprehensive wastewater management to address the pollution of its coastal waters. The procurement and protection of open space can help to keep the problem from getting worse.

d. Recommendations: An Integrated Approach

To protect its water resources, the Town of Harwich should:

- Identify water resources and watershed areas where water-quality protection is a priority. The areas may compliment the Town's wastewater planning effort by targeting watersheds not being addressed through wastewater management, such as pond and lake recharge areas.
- Evaluate an appropriate mix of conservation and passive recreational uses consistent with and complementary to other water-quality protection goals and strategies that the Town may be considering, such as wastewater and stormwater management.
- Continue to acquire target properties and work with local conservation organizations to set up conservation restrictions already being undertaken by the Save Land – Save Water Initiative.
- Develop educational programs so that the public has the opportunity to learn about the importance of open-space preservation and conservation to their water resources.

These tasks may be best achieved in conjunction with comprehensive watershed-management planning. The State guidance document [Water Resource Management](#)

[Planning: A Guide for Towns and Communities \(2006\)](#) provides guidance for development of such a plan.

D. Flood Hazard Areas

1. Description

Significant areas of Harwich are within federally designated flood hazard areas. The areas most threatened with structural damage from flooding are concentrated in North, West, South Harwich and Harwich Port. Figure 10 shows the extent and distribution of flood hazard areas in Harwich. In 1990, approximately 1,055 structures in Town were in a flood hazard area.

2. Considerations

In order for Harwich to participate in the National Flood Insurance Program, new structures and substantial alterations of existing structures must have a first floor elevation at or higher than the base flood elevation shown on the official flood insurance maps for the Town. In addition to these measures, it is suggested by the Federal Emergency Management Agency (FEMA) that construction in the flood hazard areas be minimized. FEMA also recommends any necessary construction along the coastal flood areas be kept as far from the water as possible.

Emergency preparedness plans by the U.S. Army Corps of Engineers include a projection of the land area which would be inundated during an intense, high tide hurricane storm surge. The storm surge could be a wall of water as high as twenty feet which would roll up onto and inundate much of the lower third of the Town. Figure 10 is attached to demonstrate this information.

E. Wetlands

1. Freshwater Wetlands

Wetlands are defined by Massachusetts General Law (M.G.L. Ch. 131, Section 40) according to the type and extent of wetland vegetation species present in a given location. These plant species will almost always indicate the presence of water at or near the land surface. Approximately thirteen percent of the Town's land area is wetland. Figure 10 shows the extent and distribution of freshwater wetlands in Harwich.

Fresh water wetlands are an extremely valuable natural resource. They help disperse and absorb flood waters, recharge and purify groundwater, provide habitat for wildlife, especially during climatic extremes, denitrify acid rain and excess fertilizer, serve to absorb heavy metals and pesticides, and support unique flora.

The greatest threat to wetland areas is inappropriate development resulting in removal, filling, contamination and/or siltation of wetland areas. Fortunately, state and local wetland protection laws, administered by the Conservation Commission, work to prevent encroachment on wetland resources. However, the scope of the Commission's review is

limited to construction activities within 100 feet of a vegetated wetland. In many cases, development impacts on wetlands originate farther away than 100 feet. Also, under state and local regulations, development is permissible within the 100 foot buffer, and often, Conservation Commission denials of inappropriate development within the buffer area are overturned by a Superseding Order from the State Department of Environmental Protection (DEP).

The adoption of the Rivers Act in 1996 provides protection to the two hundred foot buffer to rivers, typically overlapping the wetland buffer areas and often expanding the area of protection to these resources.

Some communities have included conservancy districts in their zoning regulations to maintain the greatest local control of development on or near environmentally sensitive land. A recent study which reviewed and analyzed regulatory controls in the four towns abutting Pleasant Bay recommended that Harwich upgrade its zoning regulations to include conservancy district regulations so as to be consistent with its neighboring towns' resource protection regulations. The conservancy district concept should be further investigated in Harwich.

Cranberry Bogs are wetlands by definition but are composed of artificially established vegetation for agricultural purposes. The process of cranberry growing requires groundwater at or just below the surface of the ground, occasional flooding of the plants and an adequate supply of sand.

Cranberry bogs are necessary components of the cranberry industry in Harwich and in Southeastern Massachusetts as a whole. In Town, they were and remain an important part of the local economy. They are also a primary determinant of the character of several areas of the Town and are of great interest to visitors. Environmentally, they provide habitat to certain turtle and salamander species and offer food for wildlife. Negative groundwater impacts may result from cranberry farming which involves the application of certain pesticides, fungicides and fertilizers. Many of these contaminants, when applied properly, are designed to break down into harmless substances before mingling with the underlying or down stream groundwater. However, mechanical and/or human error can result in the release of hazardous substances into the groundwater. Organic farming methods, which use no synthetic fertilizers, are beginning to be popular.

2. Salt Water Wetlands and Beaches

Saltwater wetlands include beach areas and wetlands with plant communities capable of persisting in a saline or brackish (mixture of salt and fresh) environment. Approximately 366 acres in Harwich contain saltwater wetlands, mainly in the Herring River and Red River marsh systems. Figure 10 shows the extent and distribution of salt water wetlands in Harwich.

There are fourteen public saltwater beaches in Harwich and numerous other private ones. See the [Harwich Cape Cod, Massachusetts - Harwich Department of Recreation, Parks &](#)

[Fields and Beaches](#) website for more specifics about the Town's beaches, their use, and accessibility.

The discussion of salt marshes in the critical habitats section summarizes the value of this wetland type and threats to its viability. The same threats to estuary resources as discussed above apply to salt marsh environments.

Beaches are an extremely important resource in Harwich because they are the focus of so many of the Town's visitors. Erosion, overuse, and debris are the primary threats to beach resources. In addition, the south shore is threatened by an invasive species of seaweed (codium fragile ssp. Tomentosoides) that has rendered the beaches unpleasant for beach users.

F. Vegetation

1. Upland Vegetation

Oak woodlands and Pitch Pine forests are the dominant vegetation of Harwich forests. Various expressions of the vegetation reflect local site conditions such as slope, slope position, land use history and past disturbance events. Under-story vegetation is primarily shrubby vegetation, including Black Huckleberry and Low Bush Blueberry with areas of Scrub Oak.

Residential development has increased within the forested urban interface area over the past two decades warranting more management issues. The forested land provides important habitat for many wildlife and plant species and serve also as a water supply and recharge area for the town. Managing the town forests for their conservation and water source values, as well as reducing wildfire hazards and protecting public safety are priorities.

There are three primary upland forest communities in Harwich:

Pitch Pine – Oak Forest/Woodland (Oak Dominant)

This woodland type has an over-story with Oak being dominant and some Pines. The under-story has a component of Black Huckleberry with occasional concentrations of Scrub Oak and other shrubs. The shrub layer is low and sparse.

Pitch Pine – Oak Forest/Woodland (Pine Dominant)

This woodland type has an over-story with Pitch Pine being dominant and some Oaks. Some of the pines may have a considerable amount of lower branches. The under-story is the same as the oak dominant woodland.

Right-of-Ways (Shrub Heath)

These areas are primarily dominated by Little Blue Stem, Pennsylvania Sedge, non-native species, Low Bush Blueberry, Black Huckleberry, occasional concentrations of Shrub Oak and other shrubs. The shrub layer is low and relatively sparse.

Natural vegetation areas, both large and small, are important to the preservation of the rural character on Cape Cod and particularly in Harwich. The more natural vegetation left intact as the town develops, the more likely Harwich will maintain a rural image. Since visitors and residents appear to enjoy the unique Cape Cod ambiance maintained by the extensive natural vegetation in Town, then the retention of such vegetation is important to the preservation of the Town's appealing character and heritage.

Aside from the aesthetic value trees and other vegetation provide, they are necessary components of the regional and global ecosystem. They provide valuable wildlife habitat, temperature moderation, air purification, and removal of pollutants from precipitation and have considerable impact on energy consumption in residences.

Public shade trees are found in Harwich's 6 parks, 19 memorial squares, the grounds of 13 Town-owned buildings, 16 Town-owned cemeteries, and along public streets. These trees are maintained by the Public Works Department. Each year, a seasonal employee of the department plants new shade trees in the above locations with the assistance of the Cape Cod Regional Technical High School's Horticultural class. Recently planted species include October Glory Maple, Crimson King Maple, Bartlett Pear, and Kwanzan Cherry.

2. Wetland Vegetation

There are two distinct types of wetland vegetation; salt marsh and freshwater. Salt marsh vegetation exists in several well-defined areas in Town where individual species can tolerate salinity and tidal inundation. Two dominant species further define salt marshes into low marsh and high marsh. These are the coarse, broad-leafed salt marsh cord grass and the smaller salt meadow grass or salt hay, respectively.

Where the high marsh meets upland vegetation goldenrod, blackrush, and panic grass will thrive. Marsh areas near the coast where freshwater seeps from the ground to meet tidal salt water, is often colonized by cattails and phragmites.

In Harwich's freshwater wetlands, the primary naturally occurring vegetation types are red maple, black tupelo, alder arrow-wood, high-bush blueberry, willows, and milkweed. These and other species provide valuable food and protection for various wildlife species and are important components of the Town's pleasant natural setting. Freshwater wetlands are impacted by development by-products such as siltation and polluted effluent and runoff. The Wetlands Protection Act, administered locally by the Conservation Commission and State-wide by the Massachusetts Department of Environmental Protection (DEP), provides significant protection of wetlands. However, the Act limits scrutiny of development proposals to an area within 100 feet of any wetland on or near the development parcel and within 200 feet of a perennial stream.

Cranberry vegetation occurs in cultivated and abandoned freshwater bog areas in significant quantities in Harwich.

3. Critical Habitats

In addition to its more common upland and wetland habitats, Harwich has several critical habitat types. Resources identified in the Cape Cod Critical Habitats Atlas, published 1990, by the Association to Preserve Cape Cod, are summarized below.

Significant or Critical Habitats

Coastal Plain Ponds

- Aunt Edies Pond

- Hawksnest cluster: Wilkers Pond, Black Pond, Hawksnest Pond, Olivers Pond

- ‘Exit 11’ cluster: Mill Pond, Cahoon Pond, Grassy Pond, Mud Pond

- Josephs Pond, Bucks Pond, and two others in vicinity

- Seymour Pond, Black Pond

Fish Runs

- Herring River, West Harwich

- Cold Brook, Harwich Port

- Andrews River, Harwich Port/South Harwich

- Red River, South Harwich

- Muddy Creek, East Harwich

Cedar swamps

- North of Bay Road

- East of Lothrop Ave

Salt Marsh

- At Herring River

- At Saquatucket Harbor

- At Red River

Barrier Beach

- At Herring River

- At Doanes Creek

- At Wychmere Harbor

- At Saquatucket Harbor

- Red River Beach

Figure 11 delineates the location of these critical habitat types.

a. Summary of Critical Habitats

i. Coastal Plain Ponds

The majority of coastal plain pond communities in New England are found on Cape Cod, and Harwich hosts several excellent examples. These pond communities are specialized due to the typically shallow, sandy bottom, with seasonal water level fluctuations that may leave the pond nearly dry by summer’s end. These water level changes enable several globally rare species to thrive where elsewhere hardier species may out-compete them. Coastal plain pond species can survive prolonged periods of drought or flooding. Pond shores are sensitive to vehicle and foot traffic.

ii. Cedar Swamps

Cedar swamps, and particularly those found in the coastal plain of Cape Cod, are found in low depressions where standing water, poor soils and low nutrient environments support a specialized community of Atlantic white cedars and red maples, sometimes mixed with pitch pine and white pine. This disappearing resource supports nesting birds and some mammals, and may provide breeding habitat for amphibians if appropriate conditions exist.

iii. Salt marshes

Salt marshes form in areas of tidal inundation, typically protected from wave energy by barrier beaches or spits. Peat develops in the higher marsh where salt hay is typically found; salt marsh cord grass is found in the lower marsh or intertidal area. Salt marshes support a wide array of wildlife, from shore and song birds to owls and hawks, and some smaller mammals. Salt marshes are also key in protecting shellfish and fisheries, and provide storm damage prevention and flood control.

iv. Barrier Beaches

Barrier beaches are typically low lying spits of land, comprised mostly of shifting sands, which support a variety of plants and animals. The harshness of the environment requires that the natural inhabitants have developed specialized strategies for survival, which in turn makes them vulnerable to changes in their habitat. Piping plover, Common terns, beach grass and beach pea are species often found on barrier beaches.

v. Vernal Pools

Harwich also hosts numerous vernal pools, many of which have been only recently inventoried and certified through the Natural Heritage and Endangered Species Program (see Figure 10), thanks in large part to the efforts of volunteers working with the Harwich Conservation Trust. A vernal pool is an ephemeral pool or small body of water, appearing in late winter/early spring as winter snow melts and spring rains pool in depressions. Typically the pool has dried and disappeared by midsummer, making vernal pools inhospitable for fish, which would otherwise eat the amphibian egg masses and larvae. The lack of fish make vernal pools ideal breeding grounds for certain amphibians and invertebrates, who will only reproduce in these temporary habitats, and typically return to their birth pool year after year. While certain regulatory protections are afforded to vernal pools once certified, the restrictions on development only affect the area of the pool itself and a 100 foot buffer around it. Since the amphibians that breed in vernal pools also require significant upland areas for the remainder of their lifecycles, there are significant conservation considerations for upland areas beyond the 100 foot buffer (up to 1,000 feet for wood frogs, for example).

G. Fisheries and Wildlife

1. Wildlife Habitat and Corridors

Over the last 40 years, considerable land areas in Harwich have ceased to function as wildlife habitats for certain species such as deer, pheasant, fox and coyote, due to

development of the land. However, such creatures are still seen within developed areas but they appear there in search of food rather than to mate or nest. Several large tracts of undeveloped land do exist which support an abundance of species. Among these, the Town Forest, and all well fields, Hawksnest State Park/Oliver's Pond property, publicly owned portions of the Herring River marsh, and the Reservoir Area are permanently protected from encroachment by development.

Areas which are unprotected from development include two 100+ acre tracts on both sides of Route 137 between Route 39 and Round Cove Road, 100+ acres between the Headwaters Drive developments and Route 6, land on either side of Island Pond Trail between the Bike Trail and Route 124, land south of Route 6 between the western end of Spruce Road and Aunt Edie's Pond, and land to the north and west of the Holmes Town Forest.

Important wildlife corridors include the Bells Neck and Coy Brook areas in West Harwich, land in North Harwich connecting to the Punkhorn in Brewster, land in East Harwich connecting to Hawksnest State Park and to Thompson's Field/water department land, and the Monomoy River corridor leading to Pleasant Bay. While some corridors do exist, many protected areas are not linked to each other and are isolated by roads and development. This arrangement has severely restricted the movement of deer herds and thereby limited their viability in this area of the Cape. The annual incidence of smaller animal kills on roadways is further evidence of the conflict between development and wildlife habitat.

Historically, clustered subdivisions in Harwich have yielded modest open space land adjacent to buildable parcels. Little thought has been given to the suitability of these areas for wildlife habitat or corridors to other habitat. Subdivision and zoning bylaws should be amended to improve the quantity and quality of open space. Provisions may include:

- A. Increase in percentage of land required to be preserved for open space in clustered subdivisions.
- B. Evaluation of land to be preserved for open space to ensure meaningful contribution towards protection of wildlife habitat and corridors.
- C. Establishment of conservation easements/restrictions.
- D. Establishment of a transfer of development rights (TDR) program.
- E. Prohibition of development in existing or expanded wetland buffer zones.

2. Diadromous fish runs

Diadromous fish include anadromous fish that live in marine waters and undergo springtime spawning runs to freshwater habitat and catadromous fish (only American eel) that are born in marine waters and have springtime runs to live in freshwater habitats. The following four diadromous species are native to Harwich waters: Atlantic tomcod (*Microgadus tomcod*), Atlantic eel (*Anguilla rostrata*), alewife (*Alosa pseudoharengus*), and white perch (*Morone americana*).

Little is known about the presence of tomcod spawning habitat in Harwich. All species are important forage for a wide range of fish and wildlife and once supported valued commercial and subsistence fisheries. Diadromous fish receive specific protection under Massachusetts Wetland Protection Act and Chapter 130 laws that define the management of marine fisheries.

The following is a list of diadromous fish runs in Harwich:

A. Herring River, West Harwich.

Species: alewife, American eel, white perch, Atlantic tomcod.

Migratory Corridor: Herring River.

Spawning and Nursery Habitat: West Reservoir, Hinkleys Pond, Seymours Pond, and Long Pond (including the connected Black, Smalls and Greenland ponds).

Spawning and Nursery acreage: 1119 acres.

Notes -- The Herring River was formerly one of largest herring runs on Cape Cod. The tomcod spawning habitat in Herring River is not known (possibly near Rt. 28). Herring River tributaries to Robbins Pond and Flax Pond (Coy Brook) were historically known to have herring runs.

B. Cold Brook, Harwichport

Species: American eel.

Migratory Corridor: Saquatucket Harbor, Carding Machine Brook and Cold Brook (Bank St. Bogs).

Spawning and Nursery Habitat: Grass Pond

Spawning and Nursery acreage: 15-20 acres.

Notes -- Cold Brook was a former river herring run with occasional recent observations, although passage is not presently possible upstream of bogs. An eel ramp (pump supplied) was installed upstream of Bank St. to pass juvenile eels in 2008 by the Mass. Division of Marine Fisheries and is seasonally managed by the Town of Harwich and Harwich Conservation Trust.

3. Andrews River, Harwichport/South Harwich

Species: American eel.

Migratory Corridor: Saquatucket Harbor, Andrews River (former Gorham Bogs).

Spawning and Nursery Habitat: no freshwater impoundments.

Spawning and Nursery acreage: in stream only.

Notes -- The history of a herring run in the Andrews River 2009 is uncertain. American eels are present and juvenile eels were observed in 2009.

4. Red River, South Harwich (Chatham border at tidal mouth).

Species: alewife and American eel.

Migratory Corridor: Red River

Spawning and Nursery Habitat: Skinequit Pond
Spawning and Nursery acreage: 15 acres.

Notes -- The Red River herring run has declined sharply in the last two decades and is presently at very low levels of abundance.

5. Muddy Creek, East Harwich (Chatham border)
Species: alewife, white perch, Atlantic tomcod and American eel.
Migratory Corridor: Pleasant Bay to Muddy Creek.
Spawning and Nursery Habitat: Ministers Pond and Mill Pond (primarily in Chatham).
Spawning and Nursery acreage: 20-25 acres.

Notes -- Large numbers of juvenile eels and dozens of river herring were observed in the upper Muddy Creek below Queen Anne Road during 2007-2008. Mass. Division of Marine Fisheries installed a passive-flow eel ramp to outflow pipe below Queen Anne Road in 2008.

3. Rare, Threatened and Endangered Species

The Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program maintains a list of vascular plants, invertebrates and vertebrates observed in Harwich that are considered endangered, threatened, or of special concern. This list is shown as Appendix C. The Natural Heritage and Endangered Species Program also publishes maps biennially indicating estimated habitats of rare and endangered species. These habitat maps, copies of which are available for viewing in Town Hall, are for use with the Massachusetts Endangered Species Act and its implementing regulations, as well as with the Massachusetts Wetlands Protection Act. The maps also serve as a planning tool for considering the most sensitive habitats in Harwich, and helping to prioritize open space acquisitions and direct appropriate locations for development activities.

Although habitats of the listed species are varied, the most common threat to all is development, which destroys, disturbs or impacts the habitats.

H. Scenic Resources and Unique Environments

1. Scenic Landscapes

Many scenic landscapes in Harwich occur naturally while many others have been created as part of the built environment.

a. Shoreline

With nearly eleven miles of tidal shoreline running from the Herring River to Red River and along Pleasant Bay, Harwich provides expansive views of the coastal areas and Nantucket Sound. While many of the direct water views are in private ownership, numerous views from public land exist. However, unless these beach areas are

approached under human power, most shoreline views have limited access due to parking constraints.

b. Harbors

The three harbors in Harwich are valuable components of the Town's historically diverse and scenic landscape. Wychmere, Allen's, and Saquatucket, all feeding into Nantucket Sound, were not naturally occurring harbor areas to shelter boats from the rough sea. Up until the late 1800's small boats would anchor between a sandbar, two-thirds of a mile from shore and the shoreline. Larger ships would dock at piers built along the coast of the sound.

In 1899, a passage in Harwich's Salt Water Pond, or Oyster Pond, was cleared out to the sea through appropriations from the state and has been well maintained as the artificial outlet Wychmere Harbor ever since.

Allen's Harbor, a onetime overgrown marsh area, was dredged and a channel opened in 1926 through private enterprise money.

Saquatucket Harbor, also a salt marsh at one time was developed by the state as a town marina in 1969.

Round Cove, a natural outlet to Pleasant Bay and eventually the Atlantic Ocean, is a unique resource as it sits just below a stretch of Route 28 in East Harwich.

c. Bogs

Many cranberry bog areas in Town, on Bank Street, Great Western Road, Pleasant Lake Avenue, Hoyt Road, Kelly Street, Pleasant Bay Road, Depot Street, Oak Street, Factory Road and Old Main Street define a part of the rural character of Harwich. These low-lying wetlands are both beautiful and a significant commercial resource enjoyed by many year-round. Harvest time draws onlookers, and the winter season's cold temperatures create the perfect shallow ice rink for skaters and hockey players when the water in the bog freezes and provides a protective shield for the cranberry plants below. During the transitional seasons when frost is a risk, many bogs take on the appearance of ponds as they are submerged under water to protect the crops.

d. Ponds

The fresh water ponds and reservoirs in Harwich provide valuable year-round scenic resources as well as recreational resources.

No two ponds in Harwich are alike and no two views of the same pond are alike. Views of Long Pond are enjoyed from boats, from the bike trail along Route 124 and Sequattom Road, or from either of the town beaches on Long Pond Drive and Cahoon Road. Bucks Pond and others are enjoyed from the houses nestled in the woods around the shore. Hawksnest Pond and other coastal plain ponds remain undeveloped, and may be enjoyed by hikers and boaters.

Oliver's Pond was permanently established as one of the few great ponds (10+ acres) on Cape Cod with no development on any of its shoreline. Its protected status was assured when the Town, the State, and the Nature Conservancy joined forces to acquire it.

e. River Corridors

The Herring River and Muddy Creek (Monomoy River) corridors are special places for canoeing, hiking, taking in nature, and preserving the history surrounding these areas. Muddy Creek leads out to Pleasant Bay and Herring River runs from Long Pond to Nantucket Sound. Several land conservation efforts, including partnerships between the town and the Harwich Conservation Trust, have resulted in protected views to these important resources.

f. Bells Neck Road/Salt Marsh/Reservoir Area

One of the most breath-taking scenic landscapes in Harwich is the conservation land in the Bells Neck Road/Reservoir area. The Herring River winds its way from the sound through West Harwich to the salt marsh of North Harwich, and into the West and East Reservoirs before it stretches farther north to the ponds in Pleasant Lake. Over 320 acres of forests, water and wetland are home to many species of animals and plant life. This vast natural area lends a very rural aspect to the Harwich landscape and is at its most beautiful in the fall and the moments surrounding sunset.

2. Major Characteristic or Unusual Geologic Features

As noted in Section IV, A, a prominent geologic feature of the Town's landscape is the series of ice-block or kettle hole ponds, both large and small scattered throughout the Town.

3. Cultural and Historic Areas

Because of the large numbers of culturally significant landscapes in Harwich involving historic town centers, churches, scenic roads and other parts of the built environment, the discussion of these elements which contribute to the character of the Town will be broken down according to the village under which they fall.

a. Harwich Center

Harwich Center has the existing local historic district located within it. Roads within this village have homes and clusters of structures which also lend to the cultural landscape of the Town. Main Street, from Sisson Road to Kelley Street; Oak Street, from Main Street to the High School; Parallel Street, from Forest Street to South Street; Kelley Street, from Main Street to Lothrop Avenue; Chatham Road, from Main Street to Long Road; and Pleasant Lake Avenue, from Main Street to just past Park Street, further demonstrate the historic character of this village.

The First Congregational Church at the corner of Main Street and Pleasant Lake Avenue is a major historic centerpiece of the village center. Public structures such as the three schools, Brooks Library, Brooks Academy Museum, Town Hall, and the Brooks Park

gazebo impact the village from a cultural standpoint, making it the institutional center of the Town. The high school property on Oak Street has been the location of many public events, including the popular Cranberry Harvest Festival fair grounds, semi-professional baseball games, and the location of several wooded paths beside the school building.

Three other areas in Harwich Center that contribute to the cultural landscape are Brooks Park, Island Pond Cemetery, and Cranberry Valley Golf Course. Brooks Park has historically been the gathering place for Town events and celebrations. Today, residents and visitors can hear the Town Band on a summer evening, peruse a craft fair, or enjoy the playground, the tennis courts, or a ball game.

Cranberry Valley, Harwich's only 18-hole golf course, is steadily growing as one of the places for golfers to spend time perfecting their favorite sport.

Island Pond Cemetery, although very different in use from the above-mentioned recreational spots, blends the scenic and cultural landscapes by intermingling nature and sentimental monuments and provides a unique look at Harwich's past and those who lived here.

b. East Harwich

Several scenic roads involving the built environment and/or natural environment run through East Harwich.

The Pleasant Bay Road/Route 39 area, most of Church Street, and Queen Anne Road between Route 39 and Church Street have the greatest concentration of pre-1900 homes in East Harwich. The Harwich portion of Route 28, along Pleasant Bay and Round Cove, provides one of the best glimpses of Pleasant Bay (from a public highway) of the four towns adjoining this body of water.

Evergreen Cemetery and the Methodist Church Cemetery, like Island Pond Cemetery, contribute as much to the historic character of East Harwich as the significant structures in the village.

c. South Harwich

South Harwich's cultural landscape stems mostly from the pre-1900 structures along Route 28 and parts of Gorham Road, Old County Road, Uncle Venie's Road and Deep Hole Road. These buildings and grounds demonstrate the pattern of construction which occurred along the village's main thoroughfares during the eighteenth and nineteenth centuries. The South Harwich Methodist Church and cemetery further add to this picture.

d. Harwich Port

Harwich Port's village center along Route 28 (Lower County Road to Bank Street) and surrounding streets are reminiscent of the traditional New England central business areas with commercial businesses, banks, and restaurants intermingling with residential structures. The Pilgrim Congregational Church, the one-time Methodist Campground area, and the many former Captain's houses and other homes on Route 28, Bank Street,

Miles Street, South Street, and Snow Inn Road, together, create the character of Harwich Port that is all its own, unlike any other village in Harwich or on the Cape.

Wychmere, Allen's, and Saquatucket Harbors and the Harwich Port Golf Course contribute to the recreational element of the built environment's cultural landscape. All are relatively recent additions to Harwich's overall landscape, but clearly serve as special places. Sailing and fishing are still major past-times of Harwich residents and visitors alike. People identify the Town with its harbors, and this association makes the village of Harwich Port a strong boat-oriented community.

The Harwich Port Golf Course, for many decades, has been a centerpiece of the village and serves a portion of the Town's golfing residents and visitors. It is also an important open space resource because of the unique character it imparts on the village.

Mount Pleasant Cemetery serves as a lasting reflection on the lives of early Harwich residents.

e. West Harwich

West Harwich, just like the other villages, has a character of its own. Unlike Harwich Port's commercial strip along Route 28 with businesses and some residents set close to the road, West Harwich is very similar in appearance and atmosphere as it was earlier in this century, with many of the stately homes set back from Route 28 but with businesses now operating within them. The facades and structures themselves have not changed much.

Route 28, Depot Street, Smith Street, Chase Street, Riverside Drive, Silver Street, Division Street, Belmont Road, and the Old Mill Point neighborhood encompass the majority of the historic structures in the village which establish a large portion of the overall character. Between Route 28 and the large waterfront homes are an abundance of cottages along the many roads leading to salt water which define the vacation home atmosphere in this area.

f. North Harwich

North Harwich historically has been known as the Cape Verdean Center of the Town and the village center reflects the remnants of its culture and history best along Depot Street, Main Street, and Queen Anne Road. Pre-1900 structures, large and small homes, and barns/garages, are clustered together on these few roads close to the street line. The active cranberry bogs and dispersion of development clusters amidst open spaces and woodlands enhance this village's rural heritage.

g. Pleasant Lake

Pleasant Lake, with fewer than twenty-five pre-1900 homes scattered along Pleasant Lake Avenue and Queen Anne Road, relies more on its natural resources to define the character of the village. The old railroad layout, now the bike path, winds through the village providing extraordinary views of Hinckley's Pond, Long Pond, and Seymour

Pond. This route facilitates imagining what it might have been like to travel the Town/Cape by train.

The Pleasant Lake General Store, once known as Bassett's General Store, has been the commercial area and centerpiece of the village for over a century. A train depot, overlooking the bogs and ponds, once stood where the parking area for the bike path and Hinckley's Pond Beach now exists. That part of the built environment disappeared with the end of the train system to the Lower Cape.

4. Areas of Critical Environmental Concern

The watershed to Pleasant Bay, including portions of Harwich, Brewster, Orleans and Chatham, has been designated as an Area of Critical Environmental Concern. The Pleasant Bay ACEC was designated by the state in 1987 due to the "outstanding natural resources on a regional and statewide level, including well-preserved and largely unaltered barrier beaches and islands, approximately 1200 acres of saltmarsh, and thousands of acres of tidal flats, numerous fresh and saltwater ponds, and a significant estuarine habitat. The barrier beaches also provide storm damage prevention.... Pleasant Bay is extremely important as a transitional area between two biogeographic provinces. As such, the biological communities of the Bay contain some species at their most northerly range and others at their most southerly range. This wealth of biodiversity and the sensitivity of the organisms living at the extent of their ranges requires greater protection for such a unique resource area." (from the designation document, 1987) Pleasant Bay is the first ACEC for which a management plan was completed, including the cooperation of the towns contributing to the watershed. Ongoing efforts by the Pleasant Bay Alliance (www.pleasantbay.org) have resulted in additional studies and management efforts to protect the bay and its natural resources.

In addition to the actions that the participating towns may take in response to the recommendations in the management plan, development projects proposed within the ACEC boundaries receive greater state regulatory scrutiny than similar projects not located in an ACEC.

Many of the scenic resources and unique environments described in this section are depicted in Figure 12, Unique and Scenic Features.

I. Environmental Problems

1. Hazardous Waste Sites

Three types of groundwater pollution hazardous waste sites have been identified: petroleum contamination, landfill, and septage lagoons.

Approximately five petroleum contamination sites can be found in Harwich; three in Harwich Port along Route 28, one in North Harwich on Depot Street, and one in Pleasant Lake in the area of the Cape Cod Regional Technical High School.

Two landfill hazardous waste sites are known to exist in Harwich; two in North Harwich in the vicinity of the Town Disposal Area and off of Lothrop Avenue in the Town's major wetland resource surrounding the Herring River. The Town Disposal Area housed the septage lagoons as of 1991. These facilities were closed as of 1992 because of their potential as a hazardous waste site.

2. Landfills

As was mentioned above, there are at least two known landfills in the village of North Harwich that may be potential environmental problems.

3. Erosion

Soil erosion is a naturally occurring event. However, this process is accelerated with the removal of vegetative cover and the alteration of natural grades. Erosion can lead to unstable ground and detrimental siltation of ponds, waterways, and wetlands. Soil disturbances adjacent to roadways often cause soil to be transported by rain and wind from a work site to natural low spots, usually wetlands, and street storm drains. The siltation of wetlands damages their ecological function and excess soil in storm drains prevents their proper operation and causes tax dollars to be spent to clean them out.

Naturally occurring erosion from storms and routine wave action has been controlled to some extent by man made structures such as jetties and groins. However, such actions may have worked against soil retention by causing more intense scouring or sand starvation of beaches. The jetties at Wychmere and Allen's Harbors and at the Herring River have large voids between the rocks which allows sand from the west to be sucked through them and accumulate in the channels. The jetty at the Herring River also malfunctions by allowing sand to wrap around it into the river channel. The maintenance of these waterways is necessary to support local and state fishing and recreational activities, but is an ongoing public expense.

Generally, the Town's Nantucket Sound shoreline has remained stable over the past twenty-five years. Comparisons of aerial photographs of the shoreline indicate only subtle movements of the top of the bank of the barrier beaches. Three exceptions are the beach at Old Mill Point which has lost from thirty feet to eighty feet of beach (in West Harwich near the Herring River outlet), the beach between Atlantic Street Beach and the Allen's Harbor channel (in Harwich Port), and the beaches just to the east of the Wychmere Harbor channel (in Harwich Port). The latter two are conveniently nourished periodically by the spoil from dredging of the respective channels.

The two breaches of the barrier beach in Chatham has caused severe erosion and lost homes in Chatham and produced significantly higher tides in Pleasant Bay. It is not yet known how this condition will affect soil retention along the bay. It has been demonstrated that the breach has fostered greater flushing action of the bay and this may accelerate erosion along some beach areas, but may also inhibit siltation of the channel into Round Cove. This may affect the availability of dredge spoils from the channel to be used as beach nourishment at the public beach at Bay Road and Route 28.

Coastal research has suggested that structural improvements such as seawalls are inadvisable for erosion mitigation because they only redirect the wave energy to scour another area either to the side or the foot of the structure. Any erosion mitigation measure proposing a structure must be studied carefully so that the problem is not shifted elsewhere, resulting in unintended consequences.

There are no specific guidelines or regulations for the controls of soil erosion in Harwich. The only regulatory agency which routinely requires soil retention measures for new development is the Conservation Commission. However, the Commission's review powers are limited to disturbances within 100 feet of vegetated wetland. Many of the sources of soil erosion which impact on wetlands are much farther away than 100 feet. No soil retention measures which would prevent the clogging of Town and private storm drains, are required by current regulations.

4. Accretion

In most other areas along the shoreline where there has been no recent erosion, sand has actually accreted (accumulated) and vegetation has extended seaward. However, this should not be viewed as a permanent gain. The natural occurrence of storms, extreme high tides, and high winds can change the face of the shoreline rapidly.

The primary areas of accretion are on the westerly side of jetties and breakwaters since these are where migrating grains of sand become trapped as they drift with the water current from west to east. One significant consequence of such accretion activity is the net increase in land area. Examination of new development potential for parcels subject to accretion is warranted.

5. Chronic Flooding

Flood Hazard areas were identified in Figure 10 and in Section IV D, earlier. No areas have been identified as having chronic flooding, although many parts of Town are in low-lying areas.

6. Sedimentation

No significant sedimentation problems have been identified for the Town of Harwich as being a threat to the environment.

7. Development Impact

It appears that the greatest threat to the environment is inappropriate development, either being constructed in a sensitive area or too great a density for an area to handle.

Many high density development areas exist in Harwich. These include some areas of West Harwich, Harwich Port, South Harwich, the Great Sand Lakes area of East Harwich, and the residential area between Long Pond Drive and Long Pond in Pleasant Lake (the western end of the pond). To decrease the potential environmental threats or problems in the areas, innovative technologies for waste disposal are being used. Harwich, like many other Cape towns, is beginning to move toward public sewerage and treatment of wastewater.

8. Forestry

The climate of Cape Cod (Harwich) is humid and characterized by a moderate to large annual temperature range, with a well-developed winter and summer seasons. Precipitation is ample in all months and favors development of forests. The vegetation exhibits a maritime influence. Prevailing winds are out of the southwest from April through October, and from the Northwest from November through March. Winds from the northeast are associated with storm events, bringing wind, rain and cold damp air. Precipitation maximums occur during the winter months and minimums usually occur in late May through July. Salt exposure and intense wind events may damage vegetation. Pines are especially susceptible to wind-throw, uprooting, crown and branch damage. Most winter storms bring the Cape storm surges from the ocean. Periodic defoliation of trees (especially Oaks) by forest insects such as the gypsy moth or the newly arrived winter moth increases the exposure of sunlight to the under-story shrubs. This dry and acidic environment slows the decay of organic matter and leads to accumulation of litter and duff.

Harwich is moving forward on management plans for conservation areas with the community. Those efforts need to be expanded to include forest resource management plans. Protecting upland forest resources should supplement our Wetland Regulations. Except for vernal pools, upland forested areas are not now protected.

We have a very active Trail Committee that has been working to link upland conservation areas to wetland and pond resources. We now have a town-wide trail guide and trails have been marked with markers and kiosks. They are now working on linking our resources to those in adjacent communities.

9. Ground and Surface Water Pollution

The most common source of groundwater pollution is the single-family residence. Even at one home per acre, water is returned to the ground at a slightly diminished quality. Where densities exceed one home per acre, groundwater becomes less pure. Many of the areas in Town not suitable for public or private water supply purposes are developed at extremely high residential densities. While this condition does not threaten public water supplies, it ultimately affects water quality where fresh water meets salty water and in certain ponds.

The fresh/salt water interface and discharge of pollutants from the fresh water occur where the fresh water on the surface of the lens meets the salt water which supports or buoys the lens. The interface area can fluctuate due to tide level, water table elevation, and well water withdrawal. Insufficient pressure from the fresh water side will result in salt water intrusion and may threaten private coastal wells. Storm inundation may also threaten coastal well quality.

Many other constituents have a negative impact on groundwater quality. These include:

- ✱ Hydrocarbons from combustion fuels such as oil, gasoline, and diesel fuel which enter groundwater from spills, underground leaks, and polluted runoff;

- ✱ Solvents and other industrial and household chemicals which enter groundwater from spills, runoff, and improper disposal;
- ✱ Agrichemicals such as pesticides, fertilizers, herbicides, etc. used in farming and domestic lawn and garden care which enter groundwater from normal application, runoff, and misuse;
- ✱ Septage treatment and landfill by-products which enter groundwater by leaching through the soil;
- ✱ Road de-icing compounds which enter ground and surface waters via road runoff and uncovered storage.

These threats may materialize in almost any location. Most business and municipal activities routinely involving hazardous material handling are regulated and closely monitored, and there are controls over spills, deliberate dumping, or improper use of hazardous materials. Adequate opportunities for proper disposal of household hazardous wastes is significant to groundwater quality.

10. Others

a. Global Warming and Climate Change

A commonly discussed phenomenon of weather is the concept of global warming, a gradual increase in the average temperature of the earth. There is now consensus among the scientific community, and increasing acceptance by the lay public, that climate change is a reality, and that considered actions to mitigate the impacts and adapt to the changes are appropriate.

The impacts to a coastal community such as Harwich from a prolonged warming trend could be quite severe as polar ice caps melt and sea level rises. However, more precise data is needed before specific mitigating measures can be formulated.

b. Air Quality

Due to the prevailing southwesterly and westerly wind patterns, Cape Cod is directly downwind from the Providence, Rhode Island metropolitan area. This means that air quality in Harwich is largely determined by pollutant levels in Providence. Air quality is monitored in Providence but not on Cape Cod. According to the 1988 Air Quality Data Summary published by the Rhode Island Department of Environmental Management, only one pollutant – ozone – out of nine monitored pollutants, had exceeded the Federal Air Quality Standards in Rhode Island in 1988. All other levels were well below the standards.

Locally, the major source of air pollution is combustion engines. Ambient air quality can be expected to diminish in the summer months when more traffic exists and the temperature is higher. The Rhode Island Air Quality Data Summary states that ozone appears to be more concentrated during hot weather.

If good air quality is to be maintained, measures to minimize or reduce traffic volumes may be necessary.

V. INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Open space or open land may be defined as land that does not contain substantial buildings, other structures, roads or other impervious surfaces. Ownership and use of open space varies greatly. An individual residential lot may contain open space used solely by that owner. A clustered subdivision may contain perimeter open space owned and used by a group of homeowners. Agricultural parcels, notably cranberry bogs in Harwich, are kept open for annual growing of crops. Golf courses, either public or private, maintain substantial acreage for recreational use. Undeveloped land, including the above examples either publicly or privately owned, may be open now but subject to potential future development and therefore not legally protected as permanent open space. Another category of unprotected land is termed “owners unknown”, meaning that clear title ownership of certain parcels is unknown. Such land could be developed and thereby removed from open space acreage once clear title is established.

Legally protected permanent open space is important for the protection of drinking water supplies, public scenic views and wildlife habitat among other open space values. There are many acres of open land owned by the town or by a non-profit organization such as the Harwich Conservation Trust, and the town continues to refine its comprehensive analysis of legally and permanently protected open space holdings.

As noted in the regional policy plan, open space has helped define Cape Cod’s heritage and economy. Open space, and the rural character it imparts, is one of the region’s most valuable assets. Marshes, beaches, farms and woodlands contribute directly to key industries on Cape Cod, attracting tourists and providing areas for farming and cranberry growing, hunting, fishing and swimming. The continued integration of open space into the fabric of the landscape and the lives of Cape residents will define the Cape’s future.

Appendix D contains a list of all open space lands in Harwich owned by the Town, by the State and by semi-public conservation trusts. Each parcel includes acreage, deed information, current use, condition, recreation potential, grant information if known, public access, zoning district and degree of protection. Additional information on ADA accessibility is provided in Appendix E. The amount of protected open space land has increased significantly since the recommendations of the 1998 Open Space and Recreation Plan, largely due to land purchases funded by the Land Bank and Community Preservation Act. Figure 13 depicts all public and semi-publicly owned lands along with selected other open space land. The Town has undertaken a significant effort to update information on all open space parcels, and that effort is continuing beyond the submission of this Open Space and Recreation Plan. The following discussion summarizes the inventory of public lands according to the level of protection afforded each.

A. Protected Lands

1. Town Owned

Appendix D includes 188 parcels held by the Board of Selectmen for a variety of purposes. Parcels used for conservation or recreation purposes include 41 associated with beaches or landings, 8 on or adjacent to a bike path, 2 in the town forest, 5 parks, and 6 associated with ponds or bogs. Additional analysis is needed to determine which of the remaining parcels held by the Selectmen are protected for open space, which should be formally dedicated as open space, and which are suitable for other municipal purposes.

Appendix D also includes 1 parcel associated with the historical commission, 3 with parks and recreation, and 41 with the water department.

2. Conservation Commission

All land held under the care of the Conservation Commission is afforded protection from development under Article 97 of the state constitution, and is considered permanently protected open space. Approximately 172 parcels with over 958 acres of Town-owned land falls under the Conservation Commission's jurisdiction. The Harwich Conservation Commission is charged with the following duties: overseeing the management of Town-owned bogs, garden plots, wetlands, and conservation land; leasing Town-owned bogs and garden plots; seedling distribution; and holding hearings to determine wetland issues and to review development plans for wetland conflicts.

3. Recreation Facilities

The Recreation and Youth Commission oversees approximately 60 parcels with over 100 acres devoted to Town beaches, parks, and memorial squares; organizes year-round and summer programs for Town youth, and; handles the sale of beach stickers. The Cranberry Valley Golf Course is a 200 acre public course owned and operated by the Town.

4. State Owned

The Commonwealth of Massachusetts owns and manages Hawksnest State Park, a combination of more than a dozen parcels with over 200 acres, in East Harwich.

5. Semi-Public Lands

Approximately 89 parcels with 338 acres of land has either been given to or purchased by the Harwich Conservation Trust. In addition, the Chatham Conservation Foundation holds 5 parcels with 9 acres in conservation in the Town of Harwich.

B. Unprotected Parcels

1. Agricultural Lands

According to the 2006 Harwich Assessor's data, approximately 232 acres of privately-owned land in Harwich are used for agricultural purposes, 58 acres of which are associated with cranberry production. The Town, in an effort to promote cranberry

cultivation, owns at least ten acres of bogs which it leases, and at least six acres of upland which are open to the public, for a fee, for gardening purposes.

2. Forest Land

Vacant land makes up approximately 13% of the total land in Harwich (1,904 acres), according to the 2006 Harwich Assessor's data. Much of this privately owned land is forest land that has the potential to be developed at any time according to the zoning district in which it is located. Approximately 840 acres has been deemed undevelopable, likely due to the presence of wetlands.

3. Less-Than-Fee Interests

Nearly 1,100 acres of wetlands can be found in Harwich and the Town has control over a large amount. The rest is privately owned, but cannot be built upon or encroached upon through the protection of the Wetlands By-law the Town has in effect which is under the jurisdiction of the Conservation Commission.

4. Private Recreation Lands

At least fourteen private/commercial recreational facilities exist in Harwich, totaling approximately 133 acres. Appendix F indicates the site, location, village, area in acres and facilities provided at each site.

5. Cape Cod Regional Technical High School

Cape Cod Regional Technical High School is located in the village of Pleasant Lake on approximately 67 acres of Pleasant Lake Avenue just northeast of the Route 6/Exit 10 interchange. Details of the school facilities and its location can be found in the school's website at <http://www.capetech.us/>.

VI. COMMUNITY VISION

A. Description of Process

The needs, opinions, and goals of Town citizens have been determined from a series of surveys, questionnaires and public meetings held over the past 40 years.

1. The previous Open Space and Recreation Plan documented numerous events between 1967 and 1998.
2. Spring, 2000 – Update of Harwich Local Comprehensive Plan approved at Town Meeting.
3. May 2009 – Open Space and Recreation Survey distributed by the Planning Board at the Annual Town Meeting. 239 survey responses were compiled.
4. June 2009 – public meeting of boards and committees to review draft Open Space and Recreation Plan.
5. December 2009 – public meeting held by Planning Board for input on open space issues for the 2010 Local Comprehensive Plan.
6. April 2010 – public meeting of boards and committees to review updated Open Space and Recreation Plan.

B. Statement of Open Space and Recreational Goals

The principles and vision articulated in the 2000 Town of Harwich Comprehensive Plan were utilized to complete the first Open Space and Recreation Plan. The four primary objectives from the previous plan remain valid for the 2010 plan:

1. **Strategic acquisition of environmentally sensitive properties** with a focus on acquisition of properties that are contiguous with existing conservation land.
2. **Optimal protection of the Town's natural resources** that make Harwich a pleasant and desirable place to live, including an aggressive and strategic land protection program.
3. **Protection and enhancement of the Town's character** through preservation of key elements of the Town's natural and built environments, including restoration of damaged or degraded resources.
4. **Development of Village Centers** with respect for natural and man made systems.

With the adoption and acceptance of this Open Space and Recreation Plan, the Town of Harwich will be working to preserve and enhance the management of open space in Harwich and protect natural resources (such as groundwater and surface water, coastal water and adjacent shoreline areas, inland and coastal wetlands, and wildlife and plant

habitats) and community character through growth management strategies while increasing the opportunities for passive and active recreation in the natural environment and managing the handling and disposal of solid and hazardous waste products.

The following analysis of needs represents the effort to preserve and protect the resources we have while dealing and living with the growth that is continuously occurring around us during the next five years.

VII. ANALYSIS OF NEEDS

1. Harwich Open Space and Recreation Survey

In May 2009, the Harwich Planning Board distributed a citizen survey to voters leaving polling places on town election day. Surveys were also made available at town hall and advertised in the local paper. 186 surveys were distributed and collected from voters, and the results tabulated. An additional 53 surveys were later collected from Town Hall drop boxes. Due to some concern that there may have been “box stuffing” by one or another interest groups in town, the results of the surveys received from the drop boxes were tabulated separately. However, based on responses to the question, “Do you want the town of Harwich to spend money for acquisition of additional open space?”, there did not appear to be any significant difference between the first and second batch of surveys (other survey answers also seemed to track consistently). Consequently, the results discussed below reflect responses to all 239 surveys received. It should be noted that while the response rate as a percentage of residents in town is relatively low, the method of distributing surveys in the 2009 round garnered significantly more than the 167 received following a mailing to every address in town in 1987.

Full time residents comprised 95% of responses; only 4 responses, or 1.7% were part-time residents; and 1 part-time non-resident (taxpayer) survey was returned.

The Planning Board felt it important to take the pulse of taxpayer support for spending additional funds on open space acquisition. 74% support acquiring additional open space, 17% do not support acquiring additional open space, and 9% did not answer the question.

The survey asked what support exists for expenditures under the Community Preservation Act funding. The numbers reflect responses in support of the various resources:

Historic preservation	61%
Affordable housing	62%
Acquisition of open space	67%
Debt service/open space	50%
Recreational facilities	49%

The survey asked, “In preserving open space, how important are each of the following?” The numbers indicate what percentage of the respondents selected the respective resources.

Scenic vistas	52%
Wildlife habitat and travel corridors	78%
Green spaces in villages	64%
Undeveloped fields and woodlands	66%
Wetland/stream buffers and vernal pools	76%
Water supply protection areas	85%

Trail corridors	54%
Active recreation areas	46%

Next, the survey asked what new or expanded recreational facilities are needed in Harwich. Respondents were asked to mark up to six choices. The responses by percentage are indicated as follows:

Beaches	40%
Bike Trails	41%
Sidewalks	52%
Picnic areas	21%
Children's play areas	26%
Athletic fields	16%
Golf course	14%
Hiking and skiing trails	39%
Neighborhood parks	34%
Access to water	58%
Signage and parking for access	26%
Swimming pool	29%
Tennis courts	8%
Town landings	28%
None	4%

There were a number of other suggestions, including allowing agricultural uses or creating community gardens, creating a dog beach or park, creating bike lanes on public ways, using public lands for cross country track meets, allowing wind/kite surfing at town beaches, creating a skate park, revitalizing Harwich Center and the Historic District, creating ATV trails, and creating an ice rink.

There also appears to be sound support for town acquisition of open space, with 69% indicating they would support an acquisition at town meeting, and 42% indicating they would contribute money toward an acquisition, 39% who would consider donating land to the conservation trust, and 34% who would donate land to the town.

The survey form can be found in Appendix G, and the full results of the survey can be found in Appendix H.

2. Resource Protection Needs

The Town of Harwich is located in a very environmentally sensitive area. The Town's proximity to the coast as well as its dependence on the Monomoy Groundwater Lens for drinking water make environmental protection everyone's concern. Preserving open space for water supply protection was the number one concern expressed by residents in the 2009 Open Space and Recreation survey (section 1). Numbers two and three on the survey were wildlife habitat and travel corridors, and wetland/stream buffers and vernal pools, respectively.

Resource protection is also critical to the Town of Harwich's financial well-being due to the Town's dependence on tourism and real estate. Any degradation of the natural resources would have a negative impact on tourism and real estate values. The Town's beaches, coastline and wetlands are all important attractions for visitors, residents and wildlife. Wildlife either viewed or hunted is also an important draw for the town. If the resources were to become damaged due to overbuilding or pollution, the Town of Harwich and its residents would suffer.

The Town of Harwich's resource protection needs are consistent with those detailed by the Cape Cod Commission in the Cape Cod Regional Policy Plan. Maintaining wildlife corridors and large patches of existing heterogeneous habitat types are an important step in maintaining the viability of wildlife habitat. Protection of significant areas is also an area of particular focus. High priority areas include:

- Zones of contribution to public water supply wells;
- Recharge areas to nitrogen-sensitive marine embayments;
- Potential public water supply areas;
- Rare species habitat and other critical habitat and natural communities, including the state's BioMap and Living Waters Map; and
- Unfragmented forest habitat adjacent to previously protected open space
- Diadromous (e.g. alewife/river herring) fish runs

3. Community Needs

The 2009 Open Space and Recreation Survey (section 1) addresses recreation needs in Harwich. Issues of access are particularly important, with access to water and sidewalks identified as the greatest needs. Other frequently selected recreation needs are bike trails, beaches and hiking and skiing trails. The responses of local residents are consistent with a survey conducted as part of the Massachusetts 2006 Statewide Comprehensive Outdoor Recreation Plan (SCORP). The three most often cited facilities desired by Cape residents are more swimming (17.5%) (perhaps implying the need for better access to the beaches and parking), road biking (15.5%) and walking (9.0%). A summary of existing recreation facilities and identified needs is provided in Appendix I.

A number of the community's open space needs are covered under resource protection needs above (section 2). One additional community need is access to open space. The 2006 SCORP plan notes that visitations of both wetlands and wildlife conservation areas are the highest on the Cape and Islands of any region in the State. The Town of Harwich has an extensive trail system, and parking is a continuing issue. As more and more people want to utilize these special places, demands are being heard for better access and changes in use. Additionally, the interests of the individuals in the community are quite diverse. Activities range from visiting the beach to kayaking, shellfishing, hiking, biking, fishing, hunting, agriculture and walking. With this diversity of interests, it is important that management pay particular attention to including as many interests as possible in its plans and that all town committees have an opportunity to work together and provide input.

Several segments of the community merit special attention, including seniors and handicapped persons. As noted in the Harwich Council on Aging 2009-2019 Strategic Plan, the Town's senior population may be segmented into three groups – “boomers”, age 60 – 70; middle range, age 71 – 85; and elderly, age 85+. The latter two groups may be further divided into active and sedentary populations. The Strategic Plan recommends that programs and services be identified to meet the needs of each group. A wide range of existing and proposed facilities suitable for seniors, from tennis courts to walking trails to swimming pool, are described in the appendices of this Open Space and Recreation Plan.

Accessibility must be addressed for handicapped persons. ADA accessibility on town-owned parcels is itemized in Appendix D. The ADA Self-Evaluation Report, Appendix E, documents recreation facilities that have suitable access and those that do not. The latter will serve as a basis for future improvements. Identified needs for recreation facilities, as listed in Appendix I, include several rest rooms that will meet ADA accessibility standards.

4. Management Needs

Due to the Town's success in preserving almost 400 acres over the past 15 years, management of these properties is now one of the most pressing needs for the Town of Harwich. Only two town-owned areas, Thompson's Field and Muddy Creek, currently have a management plan. With over 2400 acres under the custody of 7 different entities, management will play an important role in achieving resource protection and community needs. The efforts of town organizations like the Conservation Commission, Trails Committee, and Real Estate and Open Space Committee as well as private organization like the Harwich Conservation Trust and other volunteers will be coordinated to help develop and execute land management plans. Plans will help not only to enhance access to these public spaces, but also to protect from misuse, invasive species and other forms of degradation.

VIII. GOALS AND OBJECTIVES

After analyzing the open space and recreation needs of the Town, the following goals and objectives were formulated to help the Town of Harwich effectively meet those needs by better management of existing resources and preservation of future ones.

Goal I Complete a Comprehensive Review and Inventory of Existing Town-Owned Properties

Objective 1. Update town-owned land inventory to include a list of all parcels, ownership, acquisition information, deed restrictions, accessibility, and existing and potential uses.

Objective 2. Include the town-owned land inventory in the town's GIS system to ensure resources may be better evaluated by town boards and departments and by the public.

Objective 3. Develop a ranking system to prioritize protection of town-owned parcels with particular attention paid to the items listed in Goal III, Objective 1. Consider the strategic importance of parcels based on location.

1. Currently, the Real Estate and Open Space Committee has a ranking system for evaluating potential land acquisitions which may be modified to include importance of existing parcels.

Objective 4. Establish a committee to propose land use restrictions on town-owned parcels deemed of high rank from Objective 3.

Objective 5. Determine whether any town-owned parcels are not needed for open space purposes and may be considered for use in accomplishing other Town goals, such as affordable housing.

Goal II Develop Land Management Plans for Existing Conservation Properties

Objective 1. Consolidate individual town-owned parcels into land management areas/districts whereby these areas/districts may be identified as requiring management plans.

Objective 2. Identify priority areas/districts requiring management plans.

1. In December 2009 the Bells Neck and Island Pond Conservation Areas were identified as immediately needing land management plan.

Objective 3. Prepare land management plans. Seek and apply for funding, prepare requests for proposals by qualified contractors, award contracts, review draft plans, and approve final management plans.

1. Clearly identify land use objectives for each management plan.
2. Execute recommendations of approved management plans.

Objective 4. Continue on a regular basis the process from Objectives 2 and 3 in identifying new priorities and preparing additional management plans or amending existing management plans.

Goal III Identify Future Open Space Purchases

Objective 1. Identify parcels for acquisition by the town that would contribute to the town's open space goals and objectives. Encourage acquisition of parcels that abut existing conservation and open space land. Particular emphasis should be placed on:

- Zones of contribution to public water supply wells,
- Recharge areas to nitrogen-sensitive marine embayments,
- Marine areas susceptible to flooding,
- Potential public water supply areas,
- Rare species habitat and other critical habitat and natural communities, including the state's BioMap and Living Waters Map,
- Diadromous fish runs,
- Unfragmented forest habitat adjacent to previously protected open space, and
- Parcels which need restoration.

Objective 2. Use tools and findings from Goals I and II to assist in prioritizing land proposed for town acquisition, including:

- Rankings from Goal I, Objective 3.
- Recommendations from land management plans from Goal II.

Objective 3. Pursue available funding sources for acquisition of parcels identified in Objectives 1 and 2.

Goal IV Enhance Trail Systems Within Open Space Areas

Objective 1. Develop a network of trails for public use and enjoyment throughout all major Town-owned parcels and facilities. Include interior and connecting trails on Town-owned parcels (where pedestrian and bicycle traffic would not be detrimental) in other detailed trail action plans. Involve all Town departments and committees responsible for land in this planning process.

Objective 2. Coordinate with regional trails and studies, such as the Cape Cod Commission Pathways Program, Cape Cod Rail Trail and the Cape Cod Bicycle Feasibility Study (in connection with the Cape Cod National Seashore).

Objective 3. Develop a detailed action plan that prioritizes the acquisition of specific privately-owned segments of the proposed trail network from Objective 1 or from the comprehensive trail guide (see Harwich Conservation Trust website). Present acquisition articles at Town Meeting.

Objective 4. Acquire trail easements, including easements in open space areas of existing or proposed cluster subdivisions, to provide a permanent network of wooded looped trails throughout the Town. Present acquisition articles at Town Meeting.

Objective 5. Determine appropriate levels of access, parking and sanitary facilities at sensitive locations. Mark or otherwise post the trail network from Objective 1. The Trails Committee should recommend appropriate levels of improvements at Hawksnest Pond and, when needed, seek State funding assistance in accomplishing the necessary work.

Objective 6. The Conservation Commission should coordinate with the Trails Committee concerning potential development of the Flax Pond Recreation Area (parking area, picnic area and restrooms) to serve as access to Flax Pond and the Cape Cod Rail Trail.

Objective 7. Develop an action plan that identifies ancient ways or lost trails and attempts to preserve them and includes them, where feasible, in the proposed network from Objective 1. Ancient ways shall be considered natural resource values available to the public.

Objective 8. Develop an action plan to protect, enhance, and preserve the trail systems from Objective 1, including passive use, protection of public safety and natural resource values, and deterrence of non-passive uses detrimental to the trails or Town-owned parcels such as dumping, trail obliteration or vandalism.

Goal V Protection of Natural Resources and Community Character Through Growth Management Strategies

Objective 1. Encourage development patterns that concentrate new development within or near existing villages and developed neighborhoods and away from important open space areas.

1. Designate areas for growth centers with amendments, as needed, to the Zoning Bylaw and Map.
2. Utilize this Open Space and Recreation Plan to identify important open space areas to be protected.
3. Improve existing zoning provisions, such as cluster development, or approve new zoning provisions, such as Transfer of Development Rights or Natural Resource Protection By-laws, to enhance the town's ability to protect important open space areas.

Objective 2. Establish appropriate criteria/incentives for the design of open space to be preserved through development review.

1. Require adequate setbacks to prevent development from encroaching on environmentally sensitive areas.
2. Do not approve small, fragmented parcels that are "left over" from proposed building lots. Require new open space parcels to connect to existing open space

- land and/or to protect habitats, water resource areas, or other important conservation amenities.
3. Minimize areas of disturbance and retain natural vegetation to the greatest practical extent.
 4. Encourage public access through open space areas.

Objective 3. Involve appropriate town boards/commissions in review of development activities that may impact open space areas.

1. Both Planning Board and Conservation Commission should participate in review of projects designated as Developments of Regional Impact.
2. The Planning Board should seek input from the Conservation Commission concerning open space goals during development reviews.
3. Seek additional input from committees involved in open space, such as the Real Estate and Open Space Committee and Trails Committee.

Goal VI Preserve and Enhance the Following Natural Resources: Groundwater and Surface Water; Coastal Water and Adjacent Shoreline Areas; Inland and Coastal Wetlands; and Wildlife and Plant Habitats

Objective 1. Maintain the overall quality and quantity of Harwich's ground water to ensure a sustainable supply of high quality, minimally treated drinking water.

1. Maintain Board of Health Regulations for maximum cumulative nitrate-nitrogen loads in protected areas and in growth centers.
2. Develop and implement a private well monitoring program with specific attention to withdrawal volumes and water quality.
3. Develop water conservation goals and devise a system for achieving the stated goals.
4. Promote a landscaping ethic that incorporates native species and other plantings which can grow well in the Cape Cod climate without use of fertilizer and chemical additives. Develop bylaws through the Conservation Commission that limit the use of fertilizers and chemical additives in wetland buffer zones.
5. Maintain an adequate hazardous waste spill response capacity.
6. Implement the following drinking water resource protection measures as needed:
 - A. Maintain the water resource protection zoning overlay districts and their accompanying zoning regulations
 - B. As data from testing identifies viable future water supply areas, they should be mapped and included within the scope of the prevailing drinking water resource protection measures. Land acquisition in the designated areas should be made a high priority
 - C. Develop and implement roadway snow removal management strategies that minimize the total application of salt and other harmful de-icing chemicals.
7. Develop and implement a program to protect delineated water resource recharge areas which includes the following measures:

- A. Completion of appropriate nutrient loading analysis of each recharge area, including inter-town analyses of shared water resources
 - B. Development of recharge area management plans which will include nutrient loading guidelines and requirements for new development, upgrading of existing septic systems when affected property is sold or re-developed, responsibility and awareness programs for all property owners, and establishment of land acquisition priorities as needed.
- 8. Pursue appropriate measures to assure the sufficiency of the public water supply needed to meet the projected year-round and seasonal water demand at build-out.
- 9. Continue the pursuit of water resource recharge area delineation, as needed.

Objective 2. Preserve and improve the ecological integrity of marine and fresh surface waters.

- 1. Identify and adopt appropriate standards for impacts on surface waters and wetlands from septic tanks, parking areas, and erosion/sedimentation.
- 2. Prepare short-term and long-range plans for mitigating existing discharges of untreated public road/parking area runoff into wetlands and water bodies.
- 3. Upon the completion of nutrient loading analysis outlined in Objective 1, identify and prioritize impacted marine and freshwater habitats, and seek funding for small-scale remedial projects. Such restoration projects should compliment larger wastewater and recharge planning goals in Objective 1 and 3, and can provide immediate public education benefits while proceeding on a shorter schedule.

Objective 3. Encourage the use of public and private sewage treatment facilities in appropriate areas where they will advance the goals of this plan and where they can be adequately managed and maintained.

- 1. Establish and/or streamline the permitting process to the greatest practical extent for innovative waste water treatment technologies
- 2. Continue the work of the Water Quality Task Force to develop and implement sewage treatment facility criteria including when such facilities would be required, where they may be permitted, how to design, construct and maintain them, and provisions for long-term maintenance/replacement.

Objective 4. Protect the public interests on the coast, including rights for fishing, fowling, and navigation and expand, where appropriate, public access to the shoreline, through acquisitions or donations and provision of facilities.

- 1. Develop and implement coastal protection/development guidelines and requirements which will specify or include the following:

- A. Existing public rights-of-way to coastal waters shall not be interfered with or obstructed
- B. Criteria for maintaining views of saltwater bodies
- C. Incentives for private development to provide public walkways and/or other access to the shorelines
- D. Establishment of public access to beaches that are nourished by publicly funded projects
- E. Any changes of a use from water-dependent to non-water-dependent must include one or more of the following public benefits:
 - 1. Provision on-site of new public access to the shoreline in the form of parking space, walkways, and/or new public views of the shoreline
 - 2. Provision off-site(within the Town) of coastal facilities such as rest rooms at beaches, additional land, parking or other coastal facilities for public use.
- F. The maximum first floor elevation for all new structures and the base flood elevation for the subject site.
- G. Prohibition of construction on coastal dunes.
- H. Minimum building setbacks from coastal bank or dune.
- I. Guidelines for reconstruction of structures following their destruction by a natural disaster.
- J. Guidelines for minimizing pedestrian and bicycle, boat and automobile traffic through critical wildlife and plant habitat areas
- K. Criteria for private and public dredging projects, including provisions for Town determination of where dredge material is to be deposited.
- L. Design criteria for storm water systems in coastal areas so that such systems could function properly after a one foot rise in mean sea level.

Objective 5. Preserve, manage and restore coastal areas so as to safeguard and perpetuate their biological, economic, and aesthetic values.

- 1. Adopt a “no boat waste discharge zone” within three miles of the Harwich Shoreline in Nantucket Sound and for all of Pleasant Bay in Harwich.

Objective 6. Control 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.

Objective 7. Maintain and improve coastal water quality to allow shell-fishing and/or swimming in all coastal waters as appropriate, and to protect and re-establish coastal ecosystems which support shellfish and finfish habitat.

- 1. Seek funding for specific water quality improvement projects adjacent to important town shellfish and finfish habitat.

Objective 8. Preserve, protect and enhance the quality and quantity of inland and coastal wetlands in Harwich.

1. Review Wetland Regulations to determine adequacy of current buffer width. Prohibit construction or disturbances of natural vegetation within designated buffer width for non-water dependent uses with appropriate exceptions such as access pathways and vista pruning, except when no other feasible alternative to such construction or disturbance exists.
2. Develop criteria and standards for how wetlands may be altered and under what circumstances, including the installation of utilities.
3. Provide incentives to restore altered or degraded wetlands, buffer areas and ponds and to remove invasive plant species.
4. Develop/maintain guidelines for best management practices for wetland related agriculture.
5. Develop regulations for soil erosion and sediment control for all properties within 100 feet of a vegetative wetland to prevent siltation impacts on wetlands.
6. Pursue amendment to the existing Town of Harwich Wetland Bylaw so as to improve wetland protection by including the following types of provisions:
 - A. Expansion of Conservation Commission jurisdiction beyond 100 feet where appropriate
 - B. Improved enforcement.
 - C. Consider Bylaw amendments that restrict the use of fertilizer and pesticides in the buffer zone and improve the function of vegetative canopy and riparian buffer in the no disturb zone adjacent to wetlands.
7. Promote the enhancement of vegetative shading and riparian buffer and reduction of sediment inputs along migratory routes of diadromous fish runs identified in Section G.

Objective 9. Continue to prevent the loss or degradation of critical wildlife and plant habitats, minimize the impact of new development on wildlife and plant habitats, and maintain existing populations and species diversity.

1. Incorporate the following guidelines into Town Bylaws and Regulations as appropriate for each of the respective land development permitting agencies:
 - A. Guidelines for determining significant impact of development on rare wildlife and plant habitats
 - B. Guidelines and requirements for when and how to do a habitat management plan
 - C. Guidelines for habitat assessment
 - D. Guidelines for maintenance/restoration of habitat
 - E. Design requirements for open space to provide best possible protection and quality of habitat.
2. Develop a priority list for land acquisition adjacent to critical wildlife and plant habitats such as shellfish growing areas, endangered plants and wildlife habitat, diadromous fish runs, and salt marsh.

Goal VII Management of the Handling and Disposal of Solid and Hazardous Waste Products

Objective 1. Continue management of an integrated solid waste system that includes source reduction, recycling, and composting and divert the maximum practical amount of municipal solid waste from incinerator and landfill through recycling and composting programs.

1. Continue to require adequate space for and access to recycling areas with incentives for the provision of common storage facilities for commercial and industrial developments.
2. Continue to provide adequate town facilities and programs to recycle, compost, and process all forms of solid and routine hazardous wastes and make usable by-products available to the public over time.

Objective 2. Manage the disposal of hazardous wastes generated by Harwich households and businesses in an environmentally sound manner.

1. Develop and distribute a hazardous waste management manual for all business licensees and home owners.
2. Continue to provide collection programs such as Household Hazardous Products (HHP).
3. Implement a responsibility and awareness program regarding hazardous wastes for all property owners in well recharge areas and recharge areas to ponds and embayments.
4. Restrict uses involving the routine handling and storage of hazardous waste from water resource recharge areas.
5. Consider adoption of a toxic and hazardous materials bylaw or regulation.

Goal VIII Preserve and Enhance Unique Natural and Manmade Features and Resources

Objective 1. Develop guidelines for sensitive design of development on, or adjacent to prehistoric or historic archaeological sites. Include a process for review of proposals subject to the guidelines.

1. Prepare and recommend for Town Meeting consideration the appropriate design guidelines and process.

Objective 2. Preserve scenic resources and unique environments as identified in Section IV.H.

1. The Historical Commission should use demolition delay bylaws to the extent possible to preserve existing historic buildings.
2. The town should use CPC funding and seek outside funding to preserve important historic buildings at their original site.
3. The Real Estate and Open Space Committee should identify and acquire sites suitable for the relocation of historic buildings where preservation at the original site is not possible.

Objective 3. Establish permanent historic interpretive facilities in areas frequented by large numbers of tourists, such as Wychmere and Saquatucket Harbors, the Herring River Corridor, and the Cape Cod and Old Colony Rail Trails, and promote understanding and appreciation of the rich history of the Town.

1. Historical Commission should recommend the locations and designs for interpretive facilities to the Board of Selectmen for construction through Town Meeting.
2. Develop promotion programs for appreciation of Town's historic resources and history.

Goal IX Preserve and Enhance Opportunities for Passive and Active Recreation to Meet the Needs of Both Residents and Visitors

Objective 1. Develop management plans and determine needed improvements for existing recreation facilities.

1. The Recreation and Youth Commission should complete preparation of its 5-year plan, which shall guide funding requests and expenditures for the next 5 years.
2. Guided by the 5-year plan, the Recreation and Youth Commission should recommend improvements at existing facilities and prepare articles for funding at Town Meeting.

Objective 2. The Recreation and Youth Commission should identify locations where additional recreation land is needed and should coordinate with the Real Estate and Open Space Committee to seek acquisition of land. Where new development is proposed in these areas, the Recreation and Youth Commission should coordinate with the Planning Board to designate open space land for recreational purposes under subdivision review requirements.

Objective 3. Construct facilities to provide for reasonable access by disabled persons to recreation facilities and natural areas including:

- A. Beach access ramps and boardwalks
- B. Braille signage in appropriate locations
- C. TDD equipment where audio programs are offered
- D. Wheelchair accessible trail facilities
- E. Accessible comfort stations.

Develop a detailed action plan to provide these access improvements including articles for funding at Town Meeting or identification of other funding sources.

Objective 4. Provide for the funding and construction of renovated and new sidewalk and bicycle facilities as identified in Appendix B.

Objective 5. Provide for the funding and construction of recreation facilities as identified in Appendix I.

IX. FIVE-YEAR ACTION PLAN 2010- 2015

Table 3 below provides a five-year action plan to accomplish the goals and objectives set forth in Section VIII. Those action items proposed to be completed following the adoption of this plan have the highest priority, although all items are important. Other than outlining the process by which to follow to implement the goals and objectives, this action plan should also assist in guiding future planning efforts to protect existing natural resources, acquire open space and create more and better recreational opportunities for the Town.

Table 3: Five Year Action Plan

Objective #	Action Item	Responsible Party¹	Time-line	Funding Source
Goal I Complete a Comprehensive Review and Inventory of Existing Town-Owned Properties				
1	Update town-owned land inventory to include a list of all parcels, ownership, acquisition information, deed restrictions, accessibility, and existing and potential uses.	CC	2010	CPA funds
2	Include the town-owned land inventory in the town's GIS system to ensure resources may be better evaluated by town boards and departments and by the public.	PD	2010	In house
3	Develop a ranking system to prioritize protection of town-owned parcels with particular attention paid to the items listed in Goal III, Objective 1. Consider the strategic importance of parcels based on location.	CC, RE, TC, RY	2010	In house
4	Establish a committee to propose land use restrictions on town-owned parcels deemed of high rank from Objective 3.	CC, PB	2010-2011	In house
5	Determine whether any town-owned parcels are not needed for open space purposes and may be considered for use in accomplishing other Town goals, such as affordable housing.	CC, PB, BS	2010-2011	In house
Goal II Develop Land Management Plans for Existing Conservation Properties				
1	Consolidate individual town-owned parcels into land management areas/districts whereby these areas/districts may be identified as requiring management plans.	CC	2010	In house

Objective #	Action Item	Responsible Party¹	Time-line	Funding Source
2	Identify priority areas/districts requiring management plans.	CC	2010	In house
3	Prepare land management plans. Seek and apply for funding, prepare requests for proposals by qualified contractors, award contracts, review draft plans, and approve final management plans.	CC	2010–2015	CPA, WHIP, Barnstable Co., State grants, private funding
4	Continue on a regular basis the process from Objectives 2 and 3 in identifying new priorities and preparing additional management plans or amending existing management plans.	CC	On-going	See above
Goal III Identify Future Open Space Purchases				
1	Identify parcels for acquisition by the town that would contribute to the town's open space goals and objectives. Encourage acquisition of parcels that abut existing conservation and open space land.	CC, RE, TC PB, BS	2010–2015	In house
2	Use tools and findings from Goals I and II to assist in prioritizing land proposed for town acquisition	CC, RE, TC PB, BS	2010–2015	In house
3	Pursue available funding sources for acquisition of parcels identified in Objectives 1 and 2.	BS, PD	2010–2015	CPS, DEP, MA Land Grants, Coastal/Estuary
Goal IV Enhance Trail Systems Within Open Space Areas				
1	Develop a network of trails for public use and enjoyment throughout all major Town-owned parcels and facilities. Include interior and connecting trails on Town-owned parcels (where pedestrian and bicycle traffic would not be detrimental) in other detailed trail action plans. Involve all Town departments and committees responsible for land in this planning process.	TC, CC,RE HCT, RY	2010-2015	In house
2	Coordinate with regional trails and studies, such as the Cape Cod Commission Pathways Program, Cape Cod Rail Trail and the Cape Cod Bicycle Feasibility Study (in connection with the Cape Cod National Seashore).	CC, TC, PD	2010-2015	In house
3	Develop a detailed action plan that prioritizes the acquisition of specific privately-owned segments of the proposed	TC, CC,RE HCT, RY	2010-2015	In house

Objective #	Action Item	Responsible Party¹	Time-line	Funding Source
	trail network from Objective 1 or from the comprehensive trail guide (see Harwich Conservation Trust website). Present acquisition articles at Town Meeting.			
4	Acquire trail easements, including easements in open space areas of existing or proposed cluster subdivisions, to provide a permanent network of wooded looped trails throughout the Town. Present acquisition articles at Town Meeting.	HCT, TC, BS, PD	2010-2015	Barnstable County Land Management Program, State Greenways and Trails Program
5	Determine appropriate levels of access, parking and sanitary facilities at sensitive locations. Mark or otherwise post the trail network from Objective 1. The Trails Committee should recommend appropriate levels of improvements at Hawksnest Pond and, when needed, seek State funding assistance in accomplishing the necessary work.	TC	2010-2015	MA parks
6	The Conservation Commission should coordinate with the Trails Committee concerning potential development of the Flax Pond Recreation Area (parking area, picnic area and restrooms) to serve as access to Flax Pond and the Cape Cod Rail Trail.	TC,CC	2011-2012	CPA,
7	Develop an action plan that identifies ancient ways or lost trails and attempts to preserve them and includes them, where feasible, in the proposed network from Objective 1. Ancient ways shall be considered natural resource values available to the public.	TC	2010-2015	In house
8	Develop an action plan to protect, enhance, and preserve the trail systems from Objective 1, including passive use, protection of public safety and natural resource values, and deter non-passive uses detrimental to the trails or Town-owned parcels such as dumping, trail obliteration or vandalism.	TC,CC	2010-2015	In house

Objective #	Action Item	Responsible Party ¹	Time-line	Funding Source
Goal V Protection of Natural Resources and Community Character Through Growth Management Strategies				
1	Encourage development patterns that concentrate new development within or near existing villages and developed neighborhoods and away from important open space areas.	PB	2010-2015	In house
2	Establish appropriate criteria/incentives for the design of open space to be preserved through development review.	PB	2010-2015	In house
3	Involve appropriate town boards/commissions in review of development activities that may impact open space areas.	PB, CC, RE, TC	2010-2015	In house
Goal VI Preserve and Enhance the Following Natural Resources: Groundwater and Surface Water; Coastal Water and Adjacent Shoreline Areas; Inland and Coastal Wetlands; and Wildlife and Plant Habitats				
1	Maintain the overall quality and quantity of Harwich's ground water to ensure a sustainable supply of high quality, minimally treated drinking water.	BH, CC	On-going	In house
2	Preserve and improve the ecological integrity of marine & fresh surface waters.	BH, CC, PB, NR	2011-2013	#1,#2 -In house; #3 - DEP
3	Encourage the use of public and private sewage treatment facilities in appropriate areas where they will advance the goals of this plan and where they can be adequately managed and maintained.	BH, WQ	2010-2015	In house
4	Protect the public interests on the coast, including rights for fishing, fowling, and navigation and expand, where appropriate, public access to the shoreline, through acquisitions or donations and provision of facilities.	BS, PB, CC, NR	On-going	In house
5	Preserve, manage and restore coastal areas so as to safeguard and perpetuate their biological, economic, and aesthetic values.	BS	2012	In house
6	Control 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.	PB	2012	In house
7	Maintain and improve coastal water quality to allow shell-fishing and/or	NR	2011-2013	State coastal grants

Objective #	Action Item	Responsible Party¹	Time-line	Funding Source
	swimming in all coastal waters as appropriate, and to protect and re-establish coastal ecosystems which support shellfish and finfish habitat.			
8	Preserve, protect and enhance the quality and quantity of inland and coastal wetlands in Harwich.	CC, AG	2011-2013	In house
9	Continue to prevent the loss or degradation of critical wildlife and plant habitats, minimize the impact of new development on wildlife and plant habitats, and maintain existing populations and species diversity.	CC, PB, NR, RE	2010-2015	In house, CPA, grants
Goal VII Management of the Handling and Disposal of Solid and Hazardous Waste Products				
1	Continue management of an integrated solid waste system that includes source reduction, recycling, and composting and divert the maximum practical amount of municipal solid waste from incinerator and landfill through recycling and composting programs.	PW	On-going	In-house
2	Manage the disposal of hazardous wastes generated by Harwich households and businesses in an environmentally sound manner.	PW	On-going	In-house
Goal VIII Preserve and Enhance Unique Natural and Manmade Features and Resources				
1	Develop guidelines for sensitive design of development on, or adjacent to prehistoric or historic archaeological sites. Include a process for review of proposals subject to the guidelines.	HC,PB	2011-2012	In-house
2	Preserve scenic resources and unique environments as identified in Section IV.H.	HC,RE	2010-2015	CPA, County/State grants
3	Establish permanent historic interpretive facilities in areas frequented by large numbers of tourists, such as Wychmere and Saquatucket Harbors, the Herring River Corridor, and the Cape Cod and Old Colony Rail Trails, and promote understanding and appreciation of the rich history of the Town	HC, BS	2010-2011	CPA, In-house

Objective #	Action Item	Responsible Party ¹	Time-line	Funding Source
Goal IX Preserve and Enhance Opportunities for Passive and Active Recreation to Meet the Needs of Both Residents and Visitors				
1	Develop management plans and determine needed improvements for existing recreation facilities.	RY	2010-2011	In-house, CPA
2	Identify locations where additional recreation land is needed and should coordinate with the Real Estate and Open Space Committee to seek acquisition of land. Where new development is proposed in these areas, the Recreation and Youth Commission should coordinate with the Planning Board to designate open space land for recreational purposes under subdivision review requirements.	RY, RE	On-going	CPA, State grants
3	Construct facilities to provide for reasonable access by disabled persons to recreation facilities and natural areas	RY	On-going	In-house
4	Provide for the funding and construction of renovated and new sidewalk and bicycle facilities as identified in Appendix B	RY, TC, PD, PW, BS	2011-2015	CPA, In-house, Transportation grants
5	Provide for the funding and construction of recreation facilities as identified in Appendix I.	RY, BS	2011-2015	CPA, In-house, Recreation grants

- 1) AC – Agricultural Commission
BH – Board of Health
BS – Board of Selectmen
CC – Conservation Commission
HC – Historic Commission
NR – Natural Resources Director
PB – Planning Board
PD – Planning Department
PW – Public Works Department
WQ – Water Quality Task Force
RE – Real Estate and Open Space Committee
RY – Recreation and Youth Commission
TC – Trails Committee

Open Space and Recreation Plan

Appendices A to C and E to I

APPENDIX A – VILLAGE HEARINGS

Village Hearings 1989- 1990

During late 1989 and early 1990, seven public hearings were held; one for each of Harwich's villages. Recreation, open space conservation, historic resources preservation, and the environment were heavily discussed topics at the hearings. The responses from Town residents regarding various issues at these hearings were as follows:

PLEASANT LAKE

Village Character

Controlling development density and intensity of use were two widely held goals of residents at the village hearing for Pleasant Lake. Public sentiment suggested that the current density under zoning for residential uses (40,000 square foot minimum lot size) should, at the minimum, be maintained. Significant interest was expressed in lowering the overall density at full development by increasing the minimum lot size.

Based on the input gathered at the hearing, there is a need to preserve the rural appearance of the village by retaining the natural vegetation wherever possible.

Another issue in this category is a need to establish a policy relative to the conditions under which, if any, development will be allowed along unpaved roads.

Environment

Water Quality – The preponderance of surface water in the village makes pond quality an obvious topic of concern. Residents attending the village hearing confirmed this by expressing concern for the current and future health of various ponds. Specific observations were made about Aunt Edie's and Hinckley's Ponds as to roads being pitched toward the ponds so that polluted storm runoff will directly enter these ponds. The proximity of an existing stump dump to Aunt Edie's Pond was also identified as a water quality concern.

The presence of high residential densities up-gradient of groundwater flows to certain ponds represents a threat to future water quality of the ponds affected. More detailed study of the groundwater flows to the ponds is needed to determine the precise location of the contributing areas. Discharge of contaminants from boat and jet ski motors as well as vehicles launching boats also threatens pond water quality.

Concern was expressed for the need to more closely scrutinize the handling of hazardous wastes generated by industrial uses within the village.

Waterways – Protection of existing waterways linking several water bodies in Pleasant Lake was a need expressed at the village hearing. Specifically mentioned were the Herring River corridor and the sluiceway between Black Pond and Long Pond.

Sanitary Facilities – The lack of any public restrooms in the village prompted a comment at the village hearing that such facilities are needed to accommodate bike trail users as well as motorists exiting the highway. Many people from both categories have approached the Pleasant Lake Medical Offices and the Pleasant Lake General Store for use of their restrooms.

Open Space/Recreation

Opinions expressed at the Pleasant Lake village hearing relative to this topic focused on the need to improve access to existing recreational areas and to establish new recreational areas within each new major subdivision.

Historic and Cultural Resources

The Herring Runs connecting several of the ponds and the space available for cultural activities at the Cape Cod Regional Technical High School on Route 124 were named at two resources important to the village.

EAST HARWICH

Village Character

Given the visual prominence of the commercial area at Routes 137 and 39 in East Harwich, concerns were expressed at the village hearing relative to maintaining control over the appearance of this area. Concern was expressed for the eventual widening of Routes 137 and 39. It was stated that it would be preferable to have such widening occur only in the commercially zoned portions of these roads. Residents attending the hearing were generally in favor of retaining the rural character of the area as a whole.

While sidewalks were deemed necessary in certain areas of the Commercial District, opposition to sidewalks elsewhere appeared to be a consensus at the village hearing.

Environment

Groundwater Quality – Concerns under this heading are summarized below:

1. Protection from excessive density.
2. Better control of road runoff and fertilizer use.
3. Proper maintenance of septic systems.
4. Adequate dispersion of affordable housing is necessary to minimize impact on groundwater.
5. Proper management of underground storage tanks.
6. Proper management of swimming pool discharges.
7. Mitigation if impacts of pollutant concentration in commercial area over the Drinking Water Resource Protection District (DWRPD).

Surface Water Quality – Concerns were expressed as to impact of acid rain on pond life as well as the impact of polluted storm-water runoff entering the ponds untreated. Nutrient loading in the ponds from high density residential uses threaten long-term water

quality. Preservation of the quality of the Pleasant Bay Area of Critical Environmental Concern is another surface water quality issue.

Water Supply – Water conservation was cited as a crucial element to management of the Town's water resources.

Debris – Adequate controls on litter from commercial uses and illegal dumping in remote wooded areas are two important issues under this heading.

Open Space/Recreation

Concerns under this heading are itemized below:

1. Extension of the bike trail through East Harwich;
2. Proper maintenance of beaches;
3. Absence of conveniently located playgrounds and walking areas;
4. Insufficient access/parking for recreational resources, especially Pleasant Bay and the Town Landing at Round Cove.

Historic and Cultural Resources

While no comments under this heading were received at the village hearing, two issues appear to warrant further investigation. One, is consideration of the Church Street area as an area of special character worthy of preservation. Written support for this concept was received after the hearing. The other is protection of the old cemetery off Walker's Pond Road which contains the remains of some Revolutionary War veterans.

SOUTH HARWICH

Village Character

The opinions expressed at the village hearing indicated a strong desire among the residents to retain the existing village character. Along these lines, there was significant enthusiasm for the establishment of an historic district along Route 28 to protect the area from inappropriate development. Also expressed was a need to protect the village's open space and quality of life now enjoyed.

Environment

The majority of the South Harwich Village is environmentally sensitive with DWRPD's covering roughly seventy-five (75%) percent of the village, significant wetlands and shallow depth to groundwater between Oliver Snow and Route 28, Skinequit Pond and its wetlands to the north and south, and extensive marsh and wetland areas near Red River Beach and along Red River. The last three features provide for exceptional natural beauty.

Environmental concerns expressed at the village hearing include the following:

1. Protection of all forms of water resources; groundwater, ponds, wetlands, and salt water.

2. Prohibiting the filling of bogs and near wetlands to make land buildable.
3. Creation of an Area of Critical Environmental Concern running from the bog north of Skinequit Pond and south to the Red River salt marsh.
4. Preventing litter from commercial areas.

It was suggested that a conservancy overlay district could be established under zoning to further protect wetland resources.

Recreation and Open Space

At the village hearing, a variety of observations were made under this heading. They are summarized below:

1. The supply of parking at Red River Beach is inadequate for such a large facility.
2. There is a need now more than ever for the gifting of land for beach use and permanent open space because of severe fiscal limitations on the Town and the State.
3. All of the Red River marsh should be protected through purchase.
4. Reserves of open space in nearby East Harwich and Harwich Center appear to be adequate to the extent that the Town need not purchase any more large areas to serve South Harwich.
5. The old railroad bed should be converted to recreational use.
6. Designated walking and bicycle paths are desirable.
7. Red River Beach should be treated with great care as it is an important asset to the Town.
8. The large bog to the north of Route 28 and south of Oliver Snow Road should be put to use as permanent open space.
9. All of the Town-owned land at Red River Beach should be identified and used by the Town.

Historic and Cultural Resources

As stated under Village Character, the concept of an historic district along Route 28 was viewed favorably by hearing attendees. In addition to historic resources along Route 28, it was noted that any inventory of historic and cultural resources should be methodical and thorough so as to obtain information on buildings, places, and events. It was stated that a lot of history exists in South Harwich but it is not visible any more. Therefore, research into historic accounts of the area should be done to connect the places of significant historic events with the present. One structure specifically mentioned as worthy of preservation is the building at the corner of Quaker Lane and Route 28.

HARWICH PORT

Village Character

The following is a summary of the issues raised at the hearing under this heading:

1. Front setbacks in the central business district between Ayer Lane and Bank Street.

2. Appropriateness of one story versus two story along Route 28 in central business area.
3. Proportions of new construction relative to existing scale of development.
4. Need for strong design controls.
5. Negative image of abandoned buildings in business area.
6. Screening of parking.
7. Need for more foot traffic through the central business area.
8. Retention of character promoted by the Harwich Port Golf Course.

It was noted that the introduction of a community sewage collection system in this area could threaten village character by increasing pressures for redevelopment on parcels which were previously unable to accommodate many higher use intensity due to septic limitations. Also, the solutions necessary to improve life-threatening hazards may impact negatively on village character.

Environment

Various aspects of water quality were the sole focus of comments under this heading at the village hearing. The specific items of concern are identified below:

1. Storm Water Runoff – Concern was expressed for the continued discharge of polluted storm runoff into various surface water bodies, particularly Wychmere Harbor which receives the bulk of the storm water from the central business area along Route 28.
2. Lawn Chemicals – There appears to be a need to regulate the application of lawn chemicals and other pollutants/nutrients near the edge of wetland areas. It was suggested that indigenous plant species which do not require special treatment to survive be used wherever possible.
3. Nutrient Loading – The ongoing seepage of nitrogen and phosphorous into embayments and the ocean raised a concern over the management of septic systems near these resources.
4. Marine Pollution – It was noted that boat holding tank discharges, spilled fuel and lubricants, and bottom paints continue to enter the marine ecosystem unabated.
5. Pond and Embayment Recharge Areas – There is a need to provide an additional layer of protection for environmentally sensitive areas such as ponds and salt water embayments. It was suggested that an overlay delineating the likely area of groundwater recharge to such resources be made part of a new regulation as soon as possible and that more detailed study be done to fine-tune this approach as funds become available.
6. Summer Rentals – Concern was expressed for the practice of overfilling summer rentals which puts a strain on septic facilities and eventually impacts negatively on nearby environmental features.
7. Conversions to Year-round Use – Of great concern to Harwich and other Cape Cod communities is the trend of conversion of seasonal structures to year-round dwellings which increases the flow of septic system pollutants to the beach areas and harbors. An owner of a converted structure expressed concern for excessive regulation regarding this issue.
8. Housing Density – It was observed that recommended housing densities should not be exceeded in the name of affordable housing.

Open Space/Recreation

The following comments were made under this heading at the village hearing:

1. Retention of the Harwich Port Golf Course would help maintain a balance in the supply of recreation and open space facilities in Harwich Port.
2. It was suggested that the Town or other conservation entity should purchase easements from owners of beachfront property to facilitate walking along the beach without having to be limited by private beach boundaries.
3. The supply of parking for and transportation to Town beach facilities appears to be inadequate.
4. Connecting Harwich Port with the bikeway system would be desirable.
5. Access to Grassy Pond could be greatly improved.

Historic/Cultural Resources

A general discussion of historic preservation at the village hearing yielded the following observations:

1. There is a question as to whether or not current zoning helps or hinders efforts to preserve historic structures in that use regulations may make it uneconomical to restore and use old buildings.
2. It was suggested that incentives rather than regulations were needed to encourage owners of historic properties to retain and restore their buildings.
3. The general sentiment of meeting attendees was that the typical historic district regulations were undesirable in that they were too restrictive.
4. Placement of markers, establishment of exhibits such as the photo display at the Chamber of Commerce Booth, and other efforts to connect residents with the past were suggested.

WEST HARWICH

Village Character

Preservation of the existing character of West Harwich was strongly advocated at the village hearing. Large free-standing, historic-appearing buildings set back from the street are the current style characteristics which dominate the landscape along Route 28. Two stories were generally accepted as appropriate. Use of an historic district as a means to preserve character was enthusiastically supported. It was noted that recent developments in the vicinity of the Baptist Church on Route 28 were tastefully done and could serve as examples for others to follow. A suggestion was made to reward those whose improvements have maintained the traditional character.

Other issues raised under this heading were encouragement of parking in the rear of structures and concentrating new commercial development at specific nodes as ways to preserve village character.

Environment

Environmental concerns raised at the village hearing are listed below:

1. Poor quality of town water during certain periods of the summer.
2. Acquisition of additional wetland and other land along the Herring River.
3. Giving due regard to the implications of sea level rise which will enlarge existing salt and fresh water wetlands.
4. Surface and groundwater impacts of existing high density development.
5. Poor beach appearance due to erosion control fences and other devices which have become damaged.
6. Use of ponds for additional water supply instead of establishing new wells.

Recreation and Open Space

The following is a summary of the comments offered at the village hearing under this heading:

1. Better maintenance is needed for the Town's existing beaches, docks, boat ramps, and parking areas.
2. Restrooms are necessary facilities at all Town beaches.
3. Walking trails and a fit-trail could be developed at the Earle Road Recreation Area.
4. A good connection with the bike trail is needed.
5. Acquisition of additional land along the Herring River is needed.
6. Harwich Junior Theater should be promoted more.
7. A boardwalk to Belmont Beach is needed.
8. Biking and walking safety needs to be improved.

The issue of the lack of a public, year-round swimming pool was raised and discussed. It was noted that about then, ten (10) years ago, a pool was proposed and defeated due to questions about liability and staffing costs.

Historic Preservation

As stated above, the current historic character of the village was deemed desirable and worthy of preservation. A show of hands at the village hearing indicated near unanimous support for an historic district along Route 28 in West Harwich. It was also noted that old cemeteries should be identified and protected.

NORTH HARWICH

Village Character

Comments under this heading were also focused on industrial uses in the village. It was suggested that existing poor industrial appearance be corrected and that landscaping standards be improved. Planting of trees by individuals or organizations on existing industrial property was offered as a means to improve appearances. It was stated that

aesthetic, traffic, and noise impacts from industrial uses be mitigated to restore/preserve the quality of life in the village. Retention of the existing residential character was also advocated.

Environment

Protection of the Herring River corridor was of utmost concern to hearing attendees. Preservation of wildlife habitat, open vistas, and water quality in this resource area was advocated. Acquisition of marsh land and marginal upland was suggested as a means to provide the desired protection. Designation of the area as an Area of Critical Environmental Concern was supported by most in attendance. However, those opposed to such action due to the bureaucratic burden favored stronger local protection measures to accomplish the same result.

The area between the Herring River and Sand Pond was suggested as being in need of investigation for environmental hazards and appropriate permanent protection. It was also noted that the Town should guard against inappropriate development at the cleared land at the corner of Great Western Road and Depot Street due to the close proximity of the Herring River.

Recreation and Open Space

The various comments made under this heading are summarized below:

1. At least one new playground is needed in the village.
2. Walkways should be established to Sand Pond.
3. A safe connection to the bike path is needed.
4. Open space should be established within affordable housing developments.
5. Existing open space should be permanently retained and never dedicated to another use.
6. Sand Pond parking and access need improvement.

Historic Preservation

The area around the intersection of Depot and Main Streets was recognized at the village hearing as exemplary of a variety of classic old Cape Cod architectural styles. While the current character of these buildings was deemed worthy of preservation by attendees, the establishment of a typical historic district to maintain appearances was rejected as being more regulation than needed.

Several features of the past and present were identified as historic or cultural resources:

- A. Old mill site off Bell's Neck Road
- B. Old cemetery off Old Brewster Road
- C. North Harwich Cemetery at Depot and Main Streets
- D. Former stage stop north of Great Western Road
- E. Old Orchard House
- F. Two former Methodist Churches
- G. Two former post offices of Main Street

Dissatisfaction with the existing remoteness from a post office was a commonly held sentiment. Concerns over increased isolation because of movement of businesses from the center of Town.

HARWICH CENTER

Village Character

The small number of comments received under this heading at the village hearing was indicative of general satisfaction with the current character of Harwich Center. It was noted at the hearing that the village is unique in that it contains a concentration of Town facilities. The poor condition of sidewalks was mentioned in terms of both safety and village character. A similar comment was offered regarding the need for better maintenance of private ways used by the public. Brett Way (adjacent to Christy's and Victorian Inn) was specifically mentioned as needing repairs. Another comment concerned the treatment of empty commercial buildings to the effect that such buildings should be guided to their optimum use for their location by means of private and public improvements. It was also suggested that incentives for property maintenance in the Historic District be developed.

Environment

Conserving Harwich's natural resources dominated the hearing discussion on the environment. Residents supported the idea of providing developers with incentives to avoid excessive stripping of the land during site preparation. It was suggested that developers replant areas that have been cleared and not used.

Other concerns expressed at the hearing and in written comments include the following:

- A. Encouraging less water usage.
- B. Dedicating more attention and resources to hazardous waste removal.
- C. Increasing efforts to raise public awareness about the benefits of recycling.
- D. Promoting innovative septic systems.
- E. Reducing septic density and overall nitrate loading.
- F. Eliminating lead paint and asbestos from old buildings.
- G. Review of storage of combustible/hazardous materials in close proximity to dwellings, particularly historic structures.
- H. Professional assessment of health risks of power line expansion in developed areas.
- I. Requiring environmental impact statements for any major building or renovation project.

Hearing attendees were particularly in favor of establishing a conservancy zoning district which would provide greater protection of wetland resources.

APPENDIX B – PRIORITY SIDEWALK/BICYCLE FACILITY IMPROVEMENTS

Sidewalks and bicycle facilities may overlap. This appendix lists priority routes for new or upgraded facilities. Depending on available rights-of-way and other local conditions, facilities may include separated bike paths (preferred 8 to 10' asphalt width), paved road shoulders for bike lanes, concrete or asphalt sidewalks with or without curbs, and various other combinations.

HARWICH CENTER/RAIL TRAILS to HARWICH PORT/ROUTE 28 CONNECTIONS

Harwich Center to Harwich Port

The highest priority is a direct connection between these two village centers:

Forest Street (Sisson Road to South Street) – a new facility is recommended to provide safe pedestrian/bike travel on a narrow road. This segment is very scenic and attracts many pedestrians.

South Street (Sisson Road to Forest Street) – if construction of a Forest Street facility proves to be unfeasible, South Street may be a suitable alternative

Bank Street (Harwich Port to Harwich Center) – One of the Town's most heavily used sidewalks is the connector between Harwich Port and Harwich Center. Upgrades are recommended, particularly at unsafe locations where sidewalk and roadway mingle at the same grade level on the inside of a curve.

Construction/upgrade of facilities on either Forest Street or South Street in addition to Bank Street would provide a strong connection between Harwich Center and Harwich Port and also would create a desirable walking/bicycle loop.

Rail Trails to Route 28

A second priority is construction of one or more separated paths between the rail trails and Route 28. Such a facility would extend the existing family-oriented bicycle network and would improve accessibility to commercial enterprises along the Route 28 corridor. While an 8 to 10 foot wide asphalt path may be the most suitable for bicycle travel, lesser widths or paving alternatives may be appropriate in some conservation-oriented locations. Any type of facility should meet ADA accessibility standards. "Share the road" or other links to villages and beaches would further improve accessibility. With limited right-of-way widths along Forest, South and Bank Streets, other locations should be considered:

Bells Neck Road – from the bike trail to Smith Street with links to Route 28.

Lothrop Road – from the bike trail to Route 28. Links along Gilbert Lane and Earle Road would enable further connections to villages and beaches.

Thompson Field – from the bike trail to Chatham Road. Links along Oliver Snow Road and Gorham Road would enable connection to Route 28 in the vicinity of Saquatucket Harbor.

Depot Road – a northerly extension from the bike trail would connect to Route 39 and then to the East Harwich pedestrian/bike network. A southerly extension from the bike trail would connect to Route 28. This facility would require a safety evaluation of a Route 28 pedestrian crossing.

BEACH CONNECTIONS

Bank Street Beach – Heavy foot traffic, including many small children, creates a high safety risk to pedestrians on the narrow, winding portion of Bank Street south of Route 28 with poor visibility around curves.

Red River Beach

Uncle Venie's Road – This road carries significant volumes of foot traffic to and from the beach. Many curving sections and high traffic volumes make pedestrians vulnerable.

Julien Road/Old Wharf Road – New sidewalks from Route 28 would carry beach-related foot traffic more safely over heavily traveled, narrow, curvy roads.

Earle Road Beach – with Town ownership of an adjacent parcel, a sidewalk could be easily constructed along Earle Road from Lower County Road to highly used Earle Road Beach.

Pleasant Bay Beach – a sidewalk is recommended along Bay Road from Church Street due to the narrow, winding nature of the road and the many beach-using pedestrians.

ALONG MAJOR HIGHWAYS

Route 137 - the Route 137 highway improvement project will include sidewalks and bike lanes from the Brewster town line to the Chatham Town line. These facilities will improve pedestrian/bike safety in the highest growth section of the town.

Route 28

Harwich Port east to Julien Road – this portion of Route 28 is the highest priority for a new sidewalk. There is potential for heavy pedestrian traffic due to tourist destinations. Safe room for walking does not now exist.

Harwich Port west to Lothrop Road – this length of sidewalk would complete a connection from the village past a major supermarket and other commercial enterprises.

West Harwich – existing sidewalks are intermittent and sometimes in poor condition. Renovations and connecting segments are recommended.

Route 124 - the section from the bike trail to Cape Cod Regional Tech School is the highest priority due to ease of connection to an existing facility and potential school use.

Route 39 – the segment from Harwich Center to East Harwich would connect bike/pedestrian networks in two key villages.

Lower County Road – funding should be restored for a previously-planned project that would provide more level grades and ADA accessibility along existing sidewalks

Long Pond Drive - construction of bike shoulders from Route 124 to Route 137 would link existing or proposed bike networks along the bike trail and in East Harwich. This segment also would facilitate a future bike loop through Brewster.

APPENDIX C - RARE AND ENDANGERED SPECIES

DIVISION OF FISHERIES AND WILDLIFE - RECENT RARE SPECIES ELEMENT OCCURRENCES IN HARWICH

Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
Bird	Charadrius melodus	Piping Plover	T	T	2006
"	Ixobrychus exilis	Least Bittern	E		1993
"	Parula americana	Northern Parula	T		1984
"	Rallus elegans	King Rail	T		1974
"	Sterna dougallii	Roseate Tern	E	E	2007
"	Sterna hirundo	Common Tern	SC		2007
Butterfly/Moth	Catocala herodias gerhardi	Gerhard's Underwing Moth	SC		1920
"	Papaipema sulphurata	Water-willow Stem Borer	T		2006
Dragonfly/Damselfly	Enallagma laterale	New England Bluets	SC		2000
"	Enallagma pictum	Scarlet Bluet	T		2004
"	Enallagma recurvatum	Pine Barrens Bluet	T		2001
Fish	Notropis bifrenatus	Bridle Shiner	SC		1956
Reptile	Terrapene carolina	Eastern Box Turtle	SC		2007
Segmented Worm	Macrobdella sestetia	Leech	SC		1977
Vascular Plant	Amelanchier nantucketensis	Nantucket Shadbush	SC		2007
"	Carex mitchelliana	Mitchell's Sedge	T		1919
"	Crocianthemum dumosum	Bushy Rockrose	SC		1988
"	Dichanthelium dichotomum ssp.	Mattamuskeet Panic-grass	E		1918
"	mattamuskeetense				
"	Dichanthelium ovale ssp.	Commons's Panic-grass	SC		2007
"	pseudopubescens				
"	Lachnanthes carolina	Redroot	SC		2002
"	Liatris scariosa var.	New England Blazing Star	SC		1918
"	novae-angliae				
"	Listera cordata	Heartleaf Twayblade	E		1916
"	Nabalus serpentarius	Lion's Foot	E		1918
"	Opuntia humifusa	Prickly Pear	E		1918

Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
Vascular Plant	Persicaria setacea	Strigose Knotweed	T		1919
"	Polygonum puritanorum	Pondshore Knotweed	SC		2003
"	Rhexia mariana	Maryland Meadow Beauty	E		1918
"	Rhynchospora scirpoides	Long-beaked Bald-sedge	SC		1986
"	Sabatia kennedyana	Plymouth Gentian	SC		2006
"	Sagittaria teres	Tereta Arrowhead	SC		2002
"	Sphenopholis pensylvanica	Swamp Oats	T		1919
"	Utricularia resupinata	Resupinate Bladderwort	T		2002
"	Utricularia subulata	Subulate Bladderwort	SC		1928

STATUS CODES

E = Endangered

T = Threatened

SC = Special Concern

Most Recent Observation

This field represents the most recent observation of that species in a town. However, because they are rare, many MESA -listed species are difficult to detect even when they are present. Natural Heritage does not have the resources to be able to conduct methodical species surveys in each town on a regular basis. Therefore, the fact that the "Most Recent Observation" recorded for a species may be several years old should not be interpreted as meaning that the species no longer occurs in a town. However, Natural Heritage regards records older than twenty-five years historic.

These data were extracted from the database of the Natural Heritage and Endangered Species Program in September 2008.

APPENDIX D – OPEN SPACE LANDS

(See Separate File)

APPENDIX E: ADA SELF-EVALUATION REPORT

A survey of town open space and recreation facilities was conducted by the town's designated ADA Coordinator in December 2009 and January 2010 with assistance from members of the Disability Rights Committee. The complete report, with photos included, is available from the Harwich Planning Department.

PUBLIC PARKING LOTS

Rte 124 Park and Ride: There are 4 handicapped accessible parking spots of universal parking regulations. Of those 4 (1 is van accessible).

Access to sheltered covering has 2 entrances each are 34 inches wide. There is no curb cut in front only on the left access side ramp to this sheltered cover.

Schoolhouse Rd. Parking Lot: The green highway sign is very helpful from rte 28. This parking lot was done over in full accordance with ADA regulations when the new Chamber of Commerce Building was built. There are 4 universal handicapped spots and 2 additional van access accessible spots closest to the Chamber of Commerce building. The access to the Chamber of Commerce Building is completely accessible including bathrooms, stalls, faucets, mirror, fixtures, and has a handicapped access full to code ramp entrance into the Chamber building.

Headwaters Drive Parking Lot: The parking lot is sandy and no handicapped accessible spaces including no van access spaces. The parking lot is approx 210 ft in length divided by 11 feet wide parking spaces = 19 ½ spaces with additional spaces along the fence. Bike Path itself is 110 inches wide.

HARBORS

Allen Harbor:

Bathrooms have a 6 inch lip and are not therefore accessible. The doors to the bathrooms are 29 inches wide.

There is one handicapped accessible parking spot with a 5ft access aisle.

This parking spot along with all of the others need to be re-painted/striped as it is difficult to see the striping.

Access to the boats: 3inch lip makes it not accessible wood (this can be easily fixed). Aluminum ramp is 32 inches and the pier is wide enough.

The blue handicapped parking sign is up to code however, located on the telephone pole.

Saquatucket Harbor:

Has 7 universal handicapped parking spaces

Handicapped bathrooms: 1 men's 1 women's ramp with rails

You can get to the Main Office by using the ramp from the parking lot that wraps around the outside of the building.

However, to get from the parking lot to the boats, you have to access the parking lot to the drive /road to do it and wrap around the building, because there are several sets of steps down from the Main Office area down to the boats. The ramp to the boat floats is 30 inches wide under one arbor and the second arbor is 24 inches wide. Floats are 36 inches or greater themselves. There is a lip from the drive through flat surface area to the ramped area that cannot be adjusted because of the nature of the structure.

The Main Office

The pull entrance door to the interior of the office building is accessible, leaving enough access space to enter in a wheelchair.

The main office inside while not designated as a public area - the entrance door to the interior main office is 28 inches wide, swings in with no handle-push to enter. The main counter top is 36 inches high.

Public restrooms are handicapped accessible: toilets, faucets/fixtures, mirror, grab bars and space in front of toilet.

Wychmere Harbor

Bathrooms have a step to get to threshold the width was 31 inches the door opening was less. The boat ramp is accessible but no accessibility onto boats large lip-no floats private boat area.

Herring River Dock: When I surveyed this property the float and ramp to the dock itself was taken up for the winter. The parking lot is sand and crushed gravel. There are no handicapped accessible parking spots or van accessible spots. The ramp up to the dock is **not in compliance** as it is 5ft high and 9 ft long and 4 ½ ft wide and a **30 degree incline**

BEACHES

NOTE: Beaches that do not have lifeguards, are not permitted to provide handicapped surf chairs.

Brooks Road Beach (off Lower County Rd.)

No bathrooms, 10 spaces 2 handicapped accessible spaces. This beach does not have Lifeguards and therefore handicapped surf chairs are not transported to this location.

Earle Road Beach

Newly expanded parking lot. 81 spaces in parking lot including 9 universal Handicapped accessible spaces including van accessible spaces.

New completely accessible bathrooms just re-done.

This beach is guarded and provides handicapped accessible surf chairs to the public.

Grey Neck Beach

Small parking lot; 1-2 handicapped spots-no van accessible handicapped spots

This beach does not provide Lifeguards therefore handicapped surf chairs are not transported to this location.

Pleasant Road Beach

This Beach has 81 parking spaces and 3 universal handicapped parking and van accessible spaces. This beach has lifeguards and therefore provides handicapped accessible surf chairs to the public. This beach currently has a handicapped accessible port a potty bathroom. The Harwich Recreation Department has received a cost estimate of \$75,000 to re-do the bathrooms alone in this location.

Atlantic Avenue Beach

10 parking spaces. No handicapped parking at all. No bathrooms at all. This beach does not provide Lifeguards therefore handicapped surf chairs are not transported to this location.

Bank Street Beach

57 regular parking spaces and 4 Handicapped accessible bathrooms accessed by ramp. Universal handicapped accessible spaces, including van accessible space. Boardwalk is accessible from the parking lot but ends at the end of the boardwalk. This beach is guarded, therefore transportation of handicapped surf chairs is made available.

Red River Beach

186 car parking lot with 10 universal handicapped spaces including van accessible spaces. Handicapped accessible bathrooms. This beach has lifeguards and therefore provides handicapped accessible surf chairs to the public.

Pleasant Bay Beach Parking

PONDS

Sand Pond

This Pond location has bathrooms that are very old but they are handicapped accessible. There are no painted lines for parking spaces, the estimated number is 50-70 spaces no handicapped spaces or van accessible spaces are included. No surf chairs at this location. Stairs to the pond make the pond itself not accessible.

Seymour's Pond (Rte 124)

This pond area is not handicapped accessible at all. This area has 3 parking spots, none of them are handicapped and there are no bathrooms available. This pond does not provide Lifeguards therefore handicapped surf chairs are not transported to this location.

Hinkley's Pond

This pond area is not handicapped accessible at all. This area has 3 parking spots, none of them are handicapped and there are no bathrooms available. This pond does not provide Lifeguards therefore handicapped surf chairs are not transported to this location.

Long Pond Wixon Cahoon

This area has a dirt lot, is not accessible and does not have any bathrooms on site. This pond does not provide Lifeguards therefore handicapped surf chairs are not transported to this location.

Long Pond Fernandez Bog

66 spots/70 parking spots, handicapped accessible, new handicapped accessible bathrooms wheelchairs are there and they can get assistance from lifeguards to transport surf chairs

TRAILS

Coy Brook

Island Pond Trail

Isabel Smith (Monomoy River)

Robbins Pond

Bells Neck Trail-This Kiosk provides a map of the trails. The parking is all sand and no marked spaces. There is no handicapped parking spaces designated, including no van access parking. The trails are up and down hills and have many roots and brush in and over parts of the trails that could impede an able bodied person from traversing the path if not paying careful attention.

Thompson's Field: This field has 2 entrances Chatham Rd. side and Rte 39 side. Both parking lots have sand and crushed gravel and Chatham Road has a semi circle drive and Route 39 has a bigger parking lot. There are not any handicapped parking spaces or van access handicapped parking spaces at either entrance to this site. An electric wheelchair resident told me he walks with his child and wife and dogs in this field entering on the rte 39 side.

Texeira Property: Texeira Kiosk also says to the right "Frances Worrell walking trail". There are 2 large rocks in front of the walking path entrance with 35 inches between the rocks. This is enough space to get a wheelchair through but purposely prevents cars or 3 wheeler type of vehicles from driving down the walking path. Parking is sand with no handicapped access or handicapped parking spaces. The trail is wide enough for wheelchairs. Sand makes a wheelchair, walker, cane, crutches etc very difficult to traverse making the participant at risk for falls.

OTHER

Harwich Community Gardens: No signage until you are on top of the site. No sign for handicapped access gardens. This is a wonderful asset to Harwich and it should be very clearly marked. **This can be easily rectified.** The entrance and the gardens are all sand terrain and no handicapped accessible spaces. The Handicapped accessible gardens are 2 heights one height is 16 inches at the lower level and 27 inches in the upper level. The water is easily accessed on the grounds adjacent to the gardens by 4.5 feet. These plots are open to any Harwich resident for a fee per season basis.

Brooks Park

Handicapped accessible parking spaces and van accessible space. Handicapped accessible bathrooms including stall, height of sinks and fixtures.

Golf Course

Wixon Pier

Round Cove

APPENDIX F - PRIVATE RECREATION FACILITIES

<u>#</u>	<u>SITE</u>	<u>LOCATION</u>	<u>VILLAGE</u>	<u>MAP</u>	<u>PARCEL</u>	<u>AREA IN ACRES</u>	<u>FACILITIES</u>
1	Stone Horse Yacht Club	Harbor Road	HP	8	S3 S4 S5	2.33	300' of tidal frontage outdoor recreation (boating) handicap accessible restroom & concession 40 boat slips & moorings 35 car parking area
2	Harwich Port Tennis	Off Freeman Street	HP	15	A7-1	2.5	4 tennis courts 25 car parking area
3	Locario Tennis Courts	Route 28	WH	12	G3-B	2.51	4 tennis courts 20 car parking area
4	Wequassett Resort & Golf Club	2173 Route 28	EH	115	S1-1 S1-2 S1-3	21.5	5 tennis courts boating & hiking 25 car parking area
5	Harwich Port Boat Works	Harbor Road	HP				20 boat slips & moorings 300' tidal frontage summer 40 car parking area winter 100 car parking area
6	Allen Harbor Marina	Lower County Road	HP	12	Y1-56 Y1-57B Y1-58B	3	70 boat slips & moorings 1 comfort station summer 50 car parking area winter 0 car parking area (boat storage)
7	Allen Harbor Yacht Club	Lower County Road	HP	13	P1-3	3	60 boat slips & moorings 200' tidal frontage 1 comfort station summer 50 car parking area winter 0 car parking area (boat storage)
8	Harwich Port Golf Club	Forest St. & South St.	HP	13 22	G1-A S1-B S1-C	77	9 hole golf course summer 60 car parking area winter 60 car parking area

#	<u>SITE</u>	<u>LOCATION</u>	<u>VILLAGE</u>	<u>MAP</u>	<u>PARCEL</u>	<u>AREA IN ACRES</u>	<u>FACILITIES</u>
9	Snow Inn Resort Tennis Courts	Route 28	HP/SH	24	T2	5.67	6 tennis courts pro shop/comfort station 73 car parking area
10	Hall's Go Carts	Route 28 & Sisson Road	HP	21	W1	3.85	go cart track large parking area
11	Grand Slam Entertainment	322 Route 28	HP	12	H5	3.31	batting cages w/9 pitching machines & bumper boat pool/small parking area
12	Trampolines	298 Route 28	HP	12	H1	1.64	12 trampolines small parking area
13	Weatherdeck Miniature Golf Course	168 Route 28	WH	11	T3-A	6.26	18 hole miniature golf course 60 car parking area
14	Harwich Junior Theater	105 Division Street	WH	10	P2	0.27	performance theater small parking area
TOTAL						132.84	

APPENDIX G: Town of Harwich 2009 Open Space and Recreation Survey

The Town of Harwich requests your views on open space and recreation priorities. This survey will take about 4 minutes to complete. Your response is important. Please return the survey in the drop boxes on election day, to any Town Office, or via mail to "Open Space and Recreation Plan Survey", 732 Main Street, Harwich, MA 02645. Survey responses are requested by Friday, May 29th. Thank you.

1. Do you want the Town of Harwich to spend money for acquisition of additional open space? ☐ Yes ☐ No

2. The Community Preservation Act authorizes collection of funds for use on community preservation projects in Harwich. How important are each of the following eligible activities for expenditure of those funds?

	Important	Neutral	Not Important
a. <input type="checkbox"/> Historic preservation	<input type="text"/>	<input type="text"/>	<input type="text"/>
b. <input type="checkbox"/> Affordable housing	<input type="text"/>	<input type="text"/>	<input type="text"/>
c. <input type="checkbox"/> Open space – acquisition of additional land	<input type="text"/>	<input type="text"/>	<input type="text"/>
d. <input type="checkbox"/> Open space - debt service payments on previously purchased land	<input type="text"/>	<input type="text"/>	<input type="text"/>
e. <input type="checkbox"/> Recreation	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. In preserving open space, how important are each of the following?

	Important	Neutral	Not Important
a. Scenic vistas	<input type="text"/>	<input type="text"/>	<input type="text"/>
b. Wildlife habitat and travel corridors	<input type="text"/>	<input type="text"/>	<input type="text"/>
c. Green spaces in villages	<input type="text"/>	<input type="text"/>	<input type="text"/>
d. Undeveloped fields and woodlands	<input type="text"/>	<input type="text"/>	<input type="text"/>
e. Wetland buffers, stream buffers and vernal pools	<input type="text"/>	<input type="text"/>	<input type="text"/>
f. Water supply protection areas	<input type="text"/>	<input type="text"/>	<input type="text"/>
g. Trail corridors	<input type="text"/>	<input type="text"/>	<input type="text"/>
h. Active recreation areas	<input type="text"/>	<input type="text"/>	<input type="text"/>

4. To preserve open spaces in town would you consider or support (mark all that apply):

- a. ☐ Contributing land to the town for conservation purposes
- b. ☐ Contributing land to a conservation trust
- c. ☐ Selling land to the town at a reduced price (a charitable contribution for tax purposes)
- d. ☐ Donating money to buy land
- e. ☐ Voting for town-supported land acquisition
- f. ☐ Selling or contributing a conservation restriction on your undeveloped property (restricts development in perpetuity)
- g. ☐ None of the above

5. What new or expanded recreational facilities would you like to see constructed in Harwich (mark up to six choices):

- | | |
|--|---|
| a. <input type="checkbox"/> Beaches | i. <input type="checkbox"/> Neighborhood parks |
| b. <input type="checkbox"/> Bike trails | j. <input type="checkbox"/> Public access to fresh and salt water bodies and shorelines |
| c. <input type="checkbox"/> Sidewalks | k. <input type="checkbox"/> Signage and parking in support of above public access |
| d. <input type="checkbox"/> Picnic areas | l. <input type="checkbox"/> Swimming pool (indoor) |
| e. <input type="checkbox"/> Children's play areas | m. <input type="checkbox"/> Tennis courts |
| f. <input type="checkbox"/> Athletic fields | n. <input type="checkbox"/> Town landings |
| g. <input type="checkbox"/> Golf course | o. <input type="checkbox"/> Other <input type="text"/> |
| h. <input type="checkbox"/> Hiking and skiing trails | p. <input type="checkbox"/> None |

6. Please check the ONE item below that describes your living situation in Harwich.

- a. ☐ Full-time resident b. ☐ Part-time resident c. ☐ Part-time non-resident

APPENDIX H - OPEN SPACE AND RECREATION SURVEY RESULTS

239 responses

Question 1	Yes	No	No Response			
Spend money on open space?	177	41	21			
Percent	74.1%	17.2%	8.8%			
Question 2	Important	Percent	Neutral	Percent	Unimportant	Percent
2a Historic preservation	146	61.1%	61	25.5%	19	7.9%
2b Affordable Housing	148	61.9%	47	19.7%	29	12.1%
2c Open Space - acquire new land	159	66.5%	39	16.3%	20	8.4%
2d Open space - debt service	120	50.2%	70	29.3%	21	8.8%
2e Recreation	118	49.4%	61	25.5%	31	13.0%
Question 3	Important	Percent	Neutral	Percent	Unimportant	Percent
3a Scenic vistas	125	52.3%	76	31.8%	18	7.5%
3b Wildlife habitat	186	77.8%	33	13.8%	11	4.6%
3c Green spaces in villages	152	63.6%	56	23.4%	12	5.0%
3d Fields and woodlands	159	66.5%	47	19.7%	20	8.4%
3e wetland buffers, vernal pools	181	75.7%	31	13.0%	12	5.0%
3f Water supply protection	204	85.4%	14	5.9%	7	2.9%
3g Trail corridors	128	53.6%	76	31.8%	16	6.7%
3h Active recreation	111	46.4%	77	32.2%	28	11.7%
Question 4	Response	Percent				
4a contributing land to town	82	34.3%				
4b contributing land to conservation trust	92	38.5%				
4c selling land to town	78	32.6%				

4d donating money	100	41.8%
4e voting for town supported land acqu	165	69.0%
4f selling a conservation restriction	65	27.2%
4g None of above	33	13.8%

Question 5	Response	Percent
5a beaches	96	40.2%
5b bike trails	99	41.4%
5c sidewalks	124	51.9%
5d picnic areas	51	21.3%
5e children's play areas	61	25.5%
5f athletic fields	39	16.3%
5g golf course	34	14.2%
5h hiking and skiing trails	92	38.5%
5i neighborhood parks	82	34.3%
5j public access to water	139	58.2%
5k signage and parking for access	62	25.9%
5l swimming pool	68	28.5%
5m tennis courts	19	7.9%
5n town landings	67	28.0%
5o other	16	6.7%
5p none	9	3.8%
Question 6	response	Percent
6a Full time resident	227	95.0%
6b Part time resident	4	1.7%
6c part time non-resident	1	0.4%

APPENDIX I - COMMUNITY FACILITIES SUMMARY OF EXISTING RECREATION FACILITIES AND NEEDS

The Recreation & Youth Department oversees 84 acres of town beaches, parks and ball fields and organizes year-round and summer recreation programs for residents of all ages

EXISTING FACILITIES	IDENTIFIED NEEDS
OCEAN BEACHES	
Red River – 196 car parking lot, restrooms	
Bank Street – 61 car parking lot, restrooms	
Earle Road – 90 car parking lot, restrooms	
Pleasant Road – 84 car parking lot, restrooms	New restroom facilities
Other – Pleasant Bay, Belmont Road, Beach Road, Gray Neck Road, Brooks Road, Wah-Wah-Taysee Road, Wyndemere Bluffs, Zylpha Road, Atlantic Avenue, Sea Street, Merkel Beach and Neel Road	
POND BEACHES	
Fernandez Bog – approx. 70 car parking lot, restrooms	New restroom facilities, pave parking area
Sand Pond – approx. 60 car parking lot, restrooms	New boathouse with restroom facilities, new swimming lesson docks
Cahoon Pond – parking and boat ramp	New boathouse (if Sand Pond boathouse is not built)
Other – Seymour Pond, Hinkleys Pond, Wixon Memorial and Bucks Pond	
PARKS	
Brooks Park – tennis courts, basketball court, playground	Additional parking, two more tennis courts, picnic area, new basketball court
Doane Park	
Exchange Park	
Wychmere Overlook	
BALLFIELDS	
Brooks Field – baseball, restrooms	
Senior Memorial Field – softball	
Potters Field – softball	
McPhee Field – soccer	
Whitehouse Field	New infield
Multi-purpose fields at the Community Center (proposed)	New multi-purpose fields for softball, Babe Ruth baseball and other recreational uses
COMMUNITY CENTER	Explore construction and maintenance costs for new swimming pool