

City of Gloucester
Open Space and Recreation Plan
2010 - 2017

Updated from plan dated 1998 - 2003

The City of Gloucester, Carolyn Kirk, Mayor

Open Space & Recreation Committee

Daniel Morris (Chair)
Noel Mann
Charles Crowley
Susan Hedman
John McElhenny
Dean Murray
Kathy Leahy (thru 5/2010)
Patti Amaral (post 6/2010)

OPEN SPACE AND RECREATION PLAN

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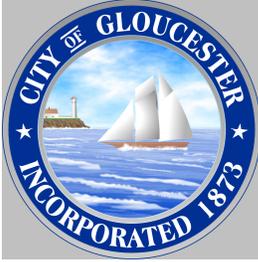
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CITY OF GLOUCESTER OPEN SPACE AND RECREATION ADVISORY COMMITTEE

Daniel Morris (Chair)
Noel Mann
Charles Crowley
Susan Hedman
John McElhenny
Dean Murray

June 2010

Dear Mayor Kirk, Councillors, Department Heads and Gloucester Citizens:

Every citizen of Gloucester has a reason to take an interest in the activities of the Open Space and Recreation Committee. The committee was selected by the mayor and received its charter from the Council a few months ago. Since then, the committee has been working on a plan that contemplates the open space and recreation resources in Gloucester.

An existing plan ('98-'03) is over a decade old, and it was crafted with a rather narrow focus. In contrast, the current committee has members with broad interests and ideas about the city's undeveloped wooded areas, its parks, ball fields, beaches, and cemeteries. Also, the new committee recognizes that the work isn't going to be done simply by crafting a plan. This group is taking a longer view of things and is concerned about establishing processes that will improve the governance, management, and maintenance of these precious city resources for years to come, by providing advice and suggesting priorities to the administration and the Council.

The committee is asking important questions.

- Where are all of the open spaces in the city?
- How are they managed? What type of stewardship is appropriate for Dogtown?
- What ordinances and state laws relate to open space? Are they current and sensible? What additional (or different types of) governance is needed?
- What accessibility improvements can and should be made?

Gloucester prides itself on its scholastic sports success. Many of Gloucester's scholastic football, soccer, softball, and track stars got their first taste of sports in our playgrounds and ball fields. With an eye towards perpetuating that tradition, as well as just to give families and kids a fun place to go, the committee is thinking about parks, playgrounds, and ball fields, too, including questions about:

- How many fields are enough to support an active community of our size?

- Do Gloucester's parks need to be modernized, made more accessible, made safer?
- What should be the priorities for maintaining, and improving and expanding Gloucester's parks and play grounds and ball fields?

Gloucester's beaches are known the world round for their beauty and bounty. These, too, are open spaces and recreation areas, as are the boat landings. If you use these areas and facilities, then you should have an interest in what the OSRC is up to. If you enjoy walking or skiing or mountain- biking through the woods of west Gloucester and Dogtown, then you should pay attention to the OSRC. If you have played T-Ball or baseball or frisbee or quidditch in one of the city's great parks or ballfields then you should get involved with the OSRC. Or even if you have deceased loved ones who are buried in Gloucester, they are taking their final rest in open space and you probably should care about Open Space and Recreation Committee and its draft plan.

The Committee enjoys the professional support of the Community Development Office. Sarah Garcia, Greg Cademartori, and Stephen Winslow have done a great job of organizing and supporting the committee. I want to express my appreciation for their work, and I invite you, too, to get involved. Please read our draft plan and take advantage of this opportunity to weigh in on a plan and a process that can touch every life in the community.

Thank you for your time today.

Sincerely,

Daniel Morris, Chairman

SECTION 1: PLAN SUMMARY

This Open Space and Recreation Plan, the City's first in over 10 years, represents a renewed commitment by the City and its residents to protect and improve the open space and recreational resources that raise the quality of life in the City. The Open Space and Recreation Committee (OSRC) envisions a city where residents take great pride in the care of Gloucester's outstanding range of open space and recreation assets and ensure they are fully enjoyed and valued. To achieve that vision, the OSRC has established five major goals.

Goal 1. Improve Stewardship of Open Space

- a. The City should develop a more complete open space land inventory that identifies:
 - Enforceable recorded easements or restrictions on the use of parcels; or
 - In the absence of such easements or restrictions, whether a law or ordinance provides enforceable use restrictions.
- b. For all open space and recreation areas in the City, the City should develop plans and rules that clearly identify the City Department responsible for managing each area, enforcing the rules and granting permission for exclusive use.
- c. The City should consider creating a stewardship partnership with the Trustees of Reservations (TTOR), Essex Greenbelt, the Massachusetts Audubon Society and other non-profits that will seek to identify and share resources to oversee use and care of passive recreation and conservation open spaces. Stewardship could include hiring of an open space warden or ranger to patrol watershed and woodland areas.
- d. Stewardship will include support for involving youth, including development and use of curriculum for classes to visit and learn about the natural environment in Gloucester.
- e. The City should take actions to help maintain the functions and value of both public and private open spaces in the face of a changing environment.

Goal 2. Improve Existing Recreation Facilities and Create New Areas to Meet Defined Needs

The City should improve and maintain its recreation facilities paying special attention to:

- a. Burnham's Field: replace damaged facilities and fences, improve lighting and provide better access for residents and police patrols;
- b. Newell Field: create a public-private partnership to develop a plan to fund the renovation of Newell Field, including pursuit of state and foundation grants and individual donations;
- c. Stage Fort Park, Good Harbor Beach and Wingaersheek: support the ongoing renovations at these major recreational facilities. Seek to reduce congestion around beaches by implementing electronic parking control and information systems;

- d. Support efforts by DPW and volunteers to maintain and improve existing athletic fields and identify opportunities for grants and donations to support these efforts
- e. Partner with local sports organizations on efforts to improve Dick Wilson Field, Mattos Field and Green Street Fields at Doucette Park in order to serve as fields for baseball, softball and other field sports;
- f. Swinsons Field: restore recreational use of the portions of the field that were damaged during recent construction.

The City should consider adding a number of recreational facilities, for example:

- g. Little league fields and basketball courts;
- h. Improved access from the Riverdale area to the fields at O'Maley School;
- i. A playground more centrally located in Magnolia.

Goal 3. Protect and Improve Gateways to Open Space, Recreation Areas and the Water

- a. All parks, playgrounds and significant tracts of open space should have signs at key entry points indicating the name of the area and appropriate uses. Gateways should be easily identifiable and, when supported by neighbors, include adequate parking if site conditions allow.
- b. An Open Space and Recreation Map should be developed that includes the City's parks, playgrounds and conservation areas. Mapping of major open space areas such as Dogtown, Magnolia Woods and Red Rocks should be improved and made available. Mapping will allow the OSRC and City to:
 - Identify access points to open space
 - Create clear, marked entrances
 - Pursue acquiring rights-of-way or easements on privately-owned land.
- c. To maintain and improve public access to the water the City should:
 - Support efforts by the Harbormaster, Waterways Board, and Conservation Commission to protect and improve public landings;
 - Create new water recreation access at Stage Fort Park; and
 - Support the addition of kayak lockers, changing areas and other infrastructure at appropriate locations.

Goal 4. Create Strategic Connections Between Existing Open Spaces

The City has large tracts of Open Space lands that would better serve residents if connections between those lands were strengthened, better marked in the field and more clearly identified on maps. The City should:

- a. Acquire undeveloped parcels that are part of continuous open spaces. Especially consider regional linkages where open spaces cross town boundaries including land near Ravenswood on the Manchester line and in Dogtown on the Rockport line are inventoried and prioritized for potential acquisition.
- b. Identify potential “green” linkages between existing protected lands, such as the connection between separate areas of the Thompson Street reservation.
- c. Identify and improve on-road and off-road connections to provide safe linkages for connection between recreational areas.

Goal 5. Strategic Preservation of Open Space

The City should clarify its open space and recreational interests so that development activities can be managed to preserve those interests.

Strategies:

- a. Define Dogtown by metes and bounds and identify abutting private parcels that are critical to the open space and recreational value of the area;
- b. For existing publicly-owned open space parcels where there is neither deed nor regulatory restriction, propose enforceable restrictions or regulations for review by the public and approval by the City Council and Mayor.
- c. Ravenswood: The City should continue its work with Trust For Public Lands and TOR to acquire 100 acres of land that sits between Ravenswood Park and Magnolia and Western Avenues
- d. Dogtown: Protected public, non-protected public and private undeveloped land abutting public land should be studied to determine strategic potential land acquisitions and protections to preserve historic passive recreational uses of the undeveloped areas;
- e. Red Rocks: Public access routes should be identified and protected;
- f. Mount Ann: An area for parking should be identified and developed and an improved trail to the summit built;
- g. Thompson Street Reservation: The area should be expanded and a gateway added;
- h. Annisquam River: Marsh lands should be protected and the City and property owners should work creatively with existing zoning to ensure upland development protects open space within the development and respects adjoining open space;
- i. Magnolia: The Magnolia Woods area should be more clearly delineated and protected.
- j. Lanesville: The City should monitor the status of the University of Massachusetts Marine Center property and be prepared to work towards an acquisition of this Center if it becomes available.

k. Downtown Gloucester:

- The Emerald Forest open space near Myrtle Square: consider working with the private landowner to allow access for a nature walk;
- Pursue Harborwalk extensions along the downtown waterfront.

l. East Gloucester: preserve wildlife corridors and expanded borders of the Audubon lands.

SECTION 2: INTRODUCTION

A. STATEMENT OF PURPOSE: WHY WRITE THIS PLAN?

This Open Space and Recreation Plan, the City’s first in over 10 years, represents a renewed commitment by the City and its residents to protect and improve the open space and recreational resources that raise the quality of life in the City. Gloucester is rich in unique and dramatic scenic landscapes that are world renowned especially along the Harbor, Beaches, Backshore and the Annisquam River. These landscapes inspire artists, provide enjoyment to local residents and attract visitors that contribute to jobs and strengthen the local economy. Gloucester Harbor provides contrasting scenes of scenic beauty and a bustling fishing port. Downtown Gloucester sits above the Harbor with its concentration of both business and residences. Small village centers sit along the major roads heading from Downtown including Riverdale, Annisquam, Bayview, Lanesville, Rocky Neck and Magnolia.

Inland from the ocean landscapes and historic villages lay extensive forests and ponds that supply fresh water and recreational opportunities and the more rural residential areas of West Gloucester. Ravenswood and Dogtown Commons encompass large tracts of woods, ponds and other watershed lands that can be reached via paths and trails.

The City has numerous parks, playgrounds and recreational fields that enrich neighborhood life and provide opportunities for play and organized sports. Stage Fort Park offers play equipment with local flair, a ship and twin lighthouses, small beaches, a waterfront picnic area, tennis courts and baseball fields. Magnolia Woods offers six soccer fields. Governor’s Park offers panoramic views of the harbor and downtown. Community groups have worked to improve fields and play equipment at our elementary schools and O’Maley Middle School.



Stage Fort Park Playground re-built with help from the Gloucester Rotary Club

Mayor Carolyn Kirk and the City Council demonstrated the City’s renewed commitment to open space and recreation by creating a permanent Open Space & Recreation Committee in 2009 with the following purpose:

The Committee shall create and implement an Open Space and Recreation Plan (OSRP) which shall:

- a. Ensure the existence, smart use and access to open space in perpetuity.

- b. Ensure that contiguous areas and functions and values that depend on them are maintained.
- c. Propose a process for agreements with abutters with shared use/conservation interests for enhancing open space.
- d. Recommend planned city growth and business development in a way that fully contemplates and strives to maintain the functions, values, uses and vision for open space in Gloucester.
- e. Establish criteria and process for ceding open space to development or dedicated use.
- f. Promote awareness and use of open spaces through a descriptive inventory of open spaces.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

The open space planning process began with a series of three neighborhood meetings in February 2009. The meetings focused on these areas of Gloucester:

- Downtown & East Gloucester
- Lanesville
- West Gloucester

The purpose of these meetings was to generate community interest and participation in the development of a new Open Space and Recreation Plan for the City. At each of the meetings the Community Development Department presented an overview of the open space planning process and specific open space maps of the geographic areas that were the focus of each meeting. From nine to 11 residents attended each of the three meetings.

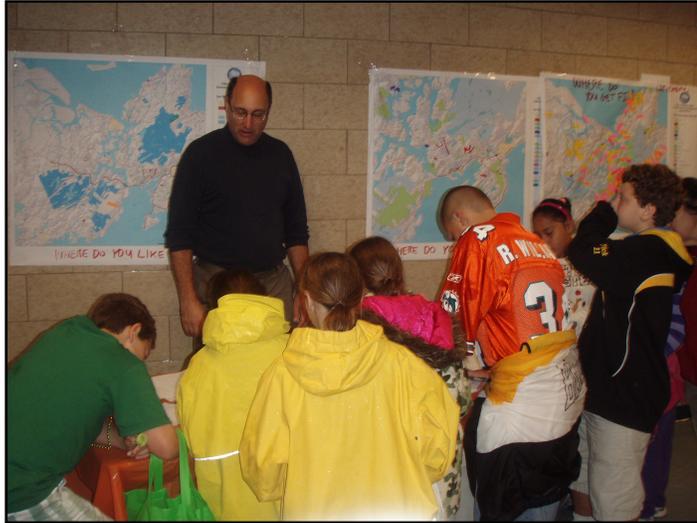
As a result of the meetings, the Community Development Department was able to recruit several residents to join an informal Open Space Advisory Committee. In June 2009 the Gloucester City Council formally created the Open Space and Recreation Committee (City of Gloucester Ordinances, SECTION 2-517). In November 2009, the Mayor recommended and the City Council approved the first appointments to the Committee. The Committee (OSRC) held its first official meeting on November 12, 2009.

OSRC held a series of committee meetings every two weeks from November 2009 through March 2010. Meeting notices were posted and members of the public were welcome to attend. At these meetings the OSRC along with Community Development Department staff shared information, offered ideas, developed inventories and reviewed initial drafts of sections of the plan and maps.

On March 18, 2010, Community Development staff held a meeting at Riverdale Park, the major low-and moderate-income housing development within the environmental justice area stretching along Washington and Poplar Street. Prominent Riverdale Park resident Loretta Peres invited residents to attend. The meeting focused on recreational and open space opportunities near Riverdale Park and ways to better connect the area to those opportunities.

On March 25, the OSRC held a community-wide meeting at City Hall (also located within the southern environmental justice area in the City). The meeting was publicized in the daily and weekly newspapers, announcements were circulated to various local list serves, and fliers were handed out in the southern environmental justice area and to the abutters to Burnham’s Field.

Additional actions taken to reach out to the community included staffing a booth at the City’s well-attended Health and Wellness Fair at the High School in September 2009. The High School is located within walking distance of the environmental justice area. All high school students attend the fair on a Friday. At the fair city staff solicited information on the most popular open space and recreational facilities from students and adults. The participants completed a survey of the most popular recreational areas in Gloucester. Over 102 students and residents completed the survey.



Youth Map Their Favorite Recreation Areas

Stage Fort Park, West Parish “Science Park” and Cripple Cove Playground were the most popular playgrounds. Favorite places to swim included Good Harbor Beach, the YMCA and Pavilion Beach. Favorite places to walk or hike included Stacy Boulevard, the Back Shore, Ravenswood, downtown and Dogtown. Favorite places to bicycle included Ravenswood, Lanesville, Dogtown and Stacy Boulevard. Favorite places to walk a dog included Goose Cove Reservoir, Dogtown, Stacy Boulevard and Ravenswood.

C. ENVIRONMENTAL JUSTICE COMMUNITY INPUT

The Commonwealth’s Executive Office of Energy and Environmental Affairs (OEEA) established an Environmental Justice Policy to help address the disproportionate share of environmental burdens experienced by lower-income people and communities of color who, at the same time, often lack environmental assets in their neighborhoods. The policy is designed to help ensure their protection from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods, such as the development of this Open Space and Recreation Plan.

There are basically two frameworks of environmental equity: stopping the environmental “bads,” such as a disproportionate burden of toxics; and promoting the environmental “goods,” such as ensuring access to parks, green amenities, and recreational opportunities.

The EOEEA policy defines an “Environmental Justice Population” as a neighborhood whose annual median household income is equal to less than 65 percent of the statewide median or whose population is made up of 25 percent or more residents who are minority, foreign born, or who lack English language proficiency. For Gloucester, certain areas of the community have concentrations of low-income residents that qualify these areas as environmental justice populations. These low income communities are concentrated in downtown Gloucester near City Hall and the Riverdale area along Washington Street.

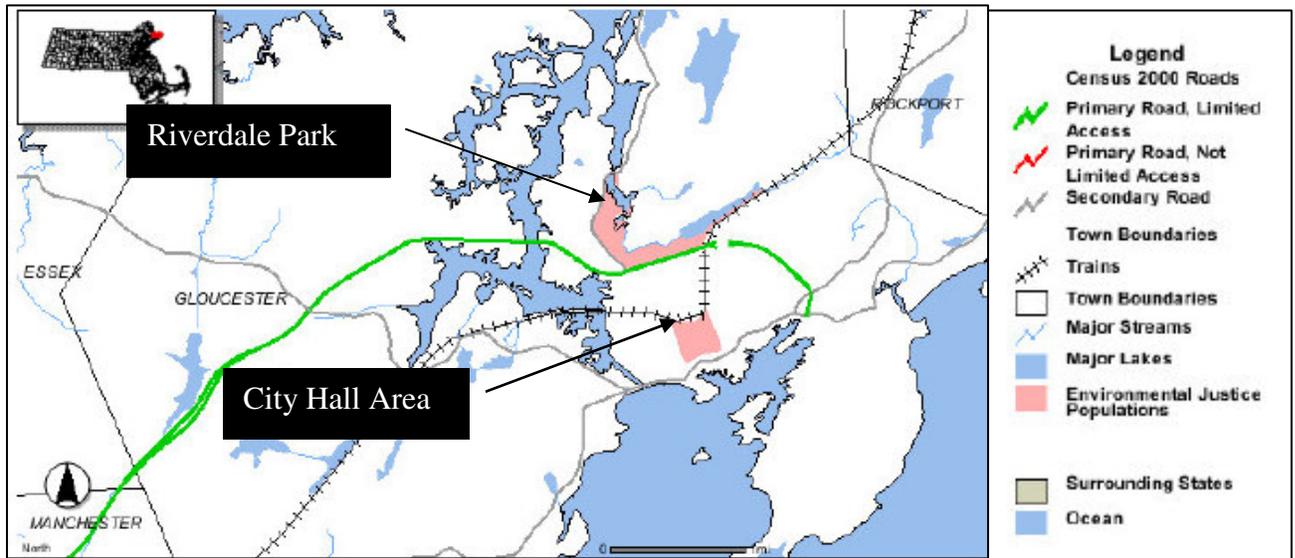


Figure 1: Gloucester’s Environmental Justice Neighborhoods

As mentioned above the OSRC specifically reached out to both the Riverdale community and the neighborhood around City Hall by providing forums to learn about and discuss open space and recreational needs and plans.

D. HOW THIS PLAN QUALIFIES GLOUCESTER FOR GRANTS

The Commonwealth’s Division of Conservation Services (DCS) oversees several grant programs that help communities buy land and develop recreational areas. Creation of a 5-year Open Space and Recreation Plan is a pre-requisite to receiving grants from these programs. The grant funding will be an essential component to making possible the City’s vision for open space and recreational opportunities as expressed in this Plan.

The Parkland Acquisition and Renovation for Communities (PARC) Program helps communities buy parkland, build new parks, and renovate existing parks. DCS issues a request for proposals (RFP) each year and selects community proposals that meet DCS’s established priorities. Recent priorities for PARC grants included new park development, especially on parkland recovered from brownfield site clean-up and those in environmental justice neighborhoods. Projects that are near urban centers close to public transportation were also given special consideration as were those that provide for park equity in a community by adding parks or rehabilitating parks in environmental justice neighborhoods.

DCS issues a new PARC's grant RFP each July. The RFP includes the selection criteria that apply to new applications, those criteria have changed very little over the past few years.

The Local Acquisitions for Natural Diversity (LAND) Program provides funding to municipalities to purchase open space. Reimbursement is based on the purchase price, or the approved appraised value, whichever is less. Land acquired or improved with LAND or PARC grants must be permanently dedicated to conservation use.

DCS establishes a re-imbusement rate each year when issuing the RFP for the PARC and LAND grants. In 2009 Gloucester was eligible for 56% re-imbusement of the acquisition or project costs. Grants for cities can range up to \$500,000. The City must have an up-to-date Open Space and Recreation Plan to be eligible. Gloucester must provide matching funds to secure these grants. Potential sources of matching funds include local bonds, Community Preservation funds and federal Community Development Block Grant funds. In-kind service or land donations are not allowed as the match.

The Federal Land and Water Conservation Fund (The LWCF) is administered by Massachusetts on behalf of the National Park Service (NPS). The LWCF program provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States. LWCF funding depends on federal appropriations on an irregular basis. The City can receive a 50% re-imbusement from this grant.

The Community Preservation Act, adopted by Gloucester voters in 2008, authorizes the City to collect a property tax surcharge to be set aside for support of open space, historic preservation and affordable housing. A minimum of ten percent of CPA funds must be spent on each of the three CPA priorities, with other 70% being allocated at the discretion of the local Community Preservation Committee (CPC) and city council. Each year the locally collected CPA funds are eligible to be matched by state CPA funds. This Open Space and Recreation Plan will be an excellent resource for Gloucester's CPC and City Council to establish priorities for awarding CPA funds to open space projects.

SECTION 3: COMMUNITY SETTING

A. REGIONAL CONTEXT

A.1. Regional Setting

Gloucester is located in Essex County in northeastern Massachusetts. The Atlantic Ocean makes up both the northern and southern borders of Gloucester, with the center of the municipality divided by the Annisquam River. Gloucester shares the Cape Ann peninsula with its eastern neighbor, Rockport. To the west lie the Towns of Manchester by the Sea and Essex. Gloucester sits 27 miles northeast of Boston and can be reached via the Rockport MBTA commuter rail line, by auto via Routes 127, 128 or 133 and by bike on Routes 127 or 133.



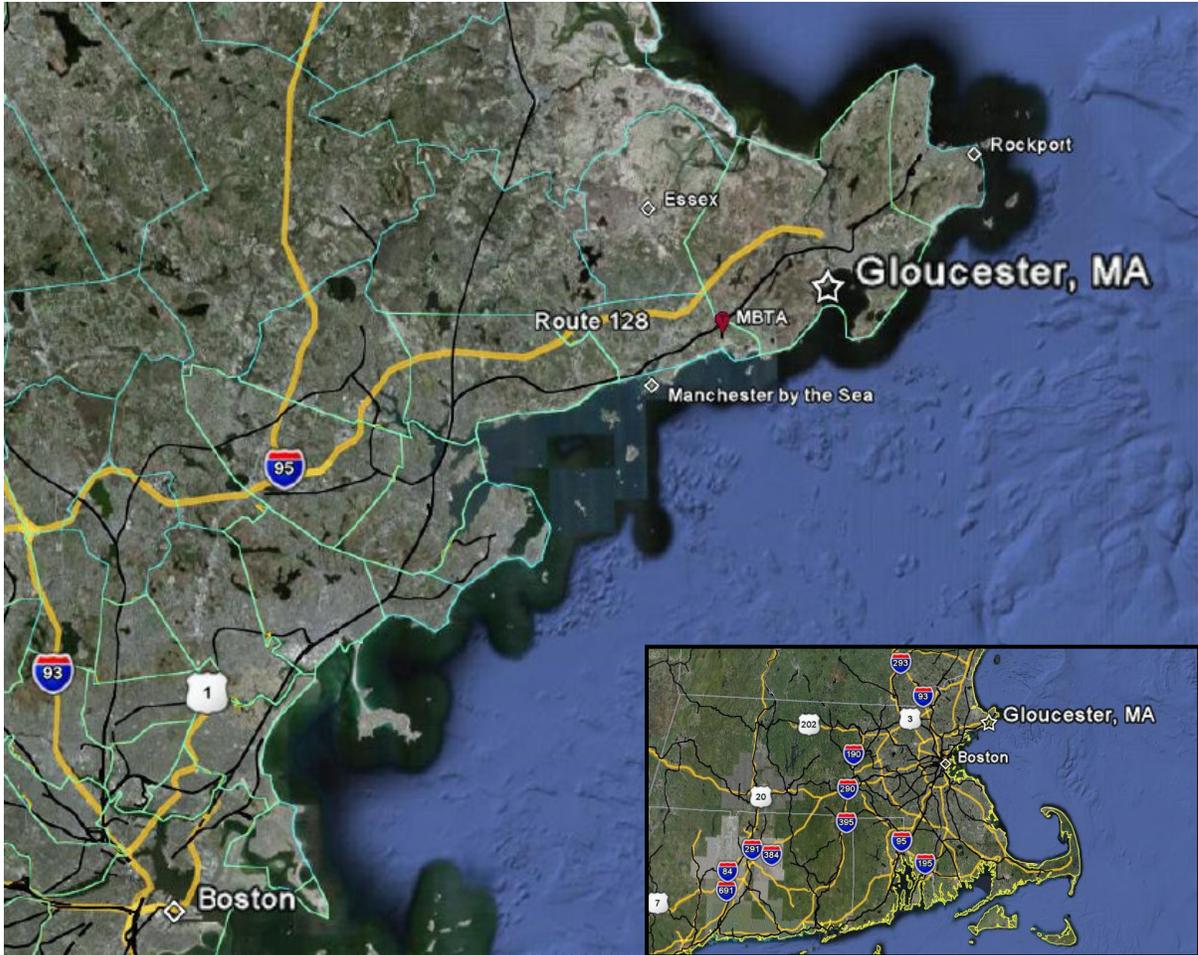
Figure 2: Cape Ann Context Map

Gloucester comprises 26 square miles of widely varying terrain, from open and sandy beaches, such as Good Harbor and Wingaersheek, to the rocky, wooded highlands of Dogtown to the verdant marshes along Jones River. There are over 64 miles of coastal shoreline along the Atlantic Ocean, harbors and coves, and the Annisquam River, as well as numerous coastal and inland wetlands¹.

A large part of the city is an island, shared with the Town of Rockport, separated from the mainland by the Annisquam River and Ipswich Bay. The island is connected to the mainland by a railroad bridge and two vehicle bridges: the beautiful A. Piatt Andrew Bridge, which was built in 1950 and carries Route 128 over the Annisquam River, and the much smaller drawbridge over the Blynman Canal, which was originally dug in 1643 and is known locally as “the Cut”. Gloucester sits at the southern end of the Great Marsh, a coastal habitat for birds and wildlife. The Great Marsh extends north through Ipswich and Newbury. At Gloucester’s western border, a semi-continuous woodland extends from Beverly north and east through Manchester, Essex, Gloucester to Rockport.

¹ Source Coastal Zone Management

Figure 3 – Regional Context Map (Google Earth)



A.2. Socio-economic Context

In terms of socio-economic context, Gloucester's well-protected harbor and its proximity to Stellwagen Bank helped establish and maintain Gloucester as a fishing village. Manufacturing is largest part of the city's economy today with durable goods, particularly machinery manufacturing, the largest component. The scenic beauty of Cape Ann and the North Shore make Gloucester and the surrounding communities of Rockport, Manchester-by-the Sea and Essex prime summer vacation spots for weekly and day tourists that support a strong tourism sector. Artists have been attracted to Gloucester for its coastal landscapes and its unique light. That scenic beauty combined with Gloucester's access to Boston via commuter rail and to jobs centers along Route 128 also makes Gloucester a desirable bedroom community for a growing number of business and service professionals.

B. HISTORY OF GLOUCESTER

Gloucester was first named "Le Beauport" by the French explorer Samuel de Champlain in 1606 because of its beautiful harbor and scenic rocky shores.

Gloucester was originally settled in 1623 by a group of Colonists headed by the Reverend John White, a Puritan minister from Dorchester, England. These early settlers and the Plymouth-bound Pilgrims formed the nucleus of the Massachusetts Bay Colony. The name "Gloucester" came from the Cathedral City in England which was also the home of many of the early settlers. The General Court granted the town charter for Gloucester in 1642. In 1873, Gloucester received a City Charter.

Gloucester is America's oldest fishing port. Since 1623, Gloucester has been serving the world as a harvester of quality seafood. Gloucester's first settlers established fishing stages – platforms and tables where fish were landed and processed for salting or drying -- in an area now known as Stage Fort Park. From these stages, Gloucester's fishing fleet grew rapidly in the 17th and 18th centuries so that Gloucester was established as a major fishing port early in its history. The fishing industry remained a staple of Gloucester's economy for nearly four centuries. In modern times it expanded due to improved methods of handling, shipping, processing and transportation. A vibrant city center developed next to the harbor, including many maritime businesses, homes for fishermen, shops and city offices.

Gloucester remains an important fishing port and working harbor despite the contraction of Gloucester fishing fleet in the late 20th century. Today the Gloucester Seafood Display Auction and the State Fish Pier serve as anchors for this \$54 million industry while federal, state and local participants pursue strategies that meet the legislative target date of 2014 for rebuilt fish stocks. The City is pursuing targeted strategies for economic development on the waterfront that supports the three key industries: the fishing industry, other maritime commerce and tourism.

Recent improvements to Main Street have attracted restaurants and shops that cater to residents and tourists alike, and development plans include strengthening the connections between Main Street and the waterfront.

C. POPULATION CHARACTERISTICS

C.1. Census Information

As of the 2000 census, there were 30,273 people, 12,592 households, and 7,895 families residing in the city. The population density was 1,166.0 people per square mile (450.2/km²). There were 13,958 housing units at an average density of 537.6/sq mi (207.6/km²). The racial makeup and major countries of ancestry are shown in Tables 2-1 and 2-2.

Table 2-1 – Racial Profile of Gloucester.

Racial Group	Percent of Population (2000 Census)
White	91.99%
African American	6.61%
Asian	0.72%
Native American	0.12%
Pacific Islander	0.02%
Other Races	0.50%
Multi-racial	1.03%

Table 2-2– Ancestral Profile of Gloucester.

Ancestry	Percent of Population (2000 Census)
Hispanic/Latino	15.48%
Italian	22.6%
Irish	16.2%
English	11.1
Portugese	8.5%
American	7.1%

There were 12,592 households out of which 27.6% had children under the age of 18 living with them, 48.8% were married couples living together, 10.6% had a female head of household with no husband present, and 37.3% were non-families. 30.7% of all households were made up of individuals and 11.4% had someone living alone who was 65 years of age or older. The average household size was 2.38 and the average family size was 3.00. The age profile of Gloucester residents in 2000 is shown in Table 2-3.

Table 2-3 – Age Profile of Gloucester Residents

Age Group	Percent of Population (2000 Census)
Under Age 18	22.0%
18 to 24	6.5%
25 to 44	29.9%
45 to 64	26.1%
65 and older	15.6%

For every 100 females there were 92.0 males. For every 100 females age 18 and over, there were 88.8 males.

The median income for a household in the city was \$58,568, and the median income for a family was \$80,970 (from a 2007 estimate). Males had a median income of \$41,465 versus \$30,566 for females. The per capita income for the city was \$25,595. About 7.1% of families and 8.8% of the population were below the poverty line, including 11.8% of those under age 18 and 11.2% of those age 65 or over.

Gloucester's population has grown over the last several decades. The 2000 census showed a population of 30,273, an increase of 5.4% over the 1990 census. The School Department enrollment figures demonstrate that the population has fluctuated over the past two decades. Some slowdown in population growth may have begun in the mid-2000's. In 2007 enrollment was actually lower than that of 1990 declining from 3,627 to 3,362. School enrollment is projected to be steady through 2012.

In 2000, the overall population density was about 1166 persons per square mile (slightly more than 1.5 persons per acre) which is less than half the Boston regional density. However Gloucester is composed of areas of high density, low density and very low density. The more densely populated areas are in the central business and downtown section including areas surrounding Gloucester Harbor, as well as Magnolia, Lanesville, Annisquam, Rocky Neck and East Gloucester.

Gloucester is a seasonal tourist community whose summer population increases by about 50 percent, resulting in an additional seasonal population of approximately 15,000 people and increasing traffic on Route 128 from 30,000 during the fall to 40,000 vehicles per day in summer.

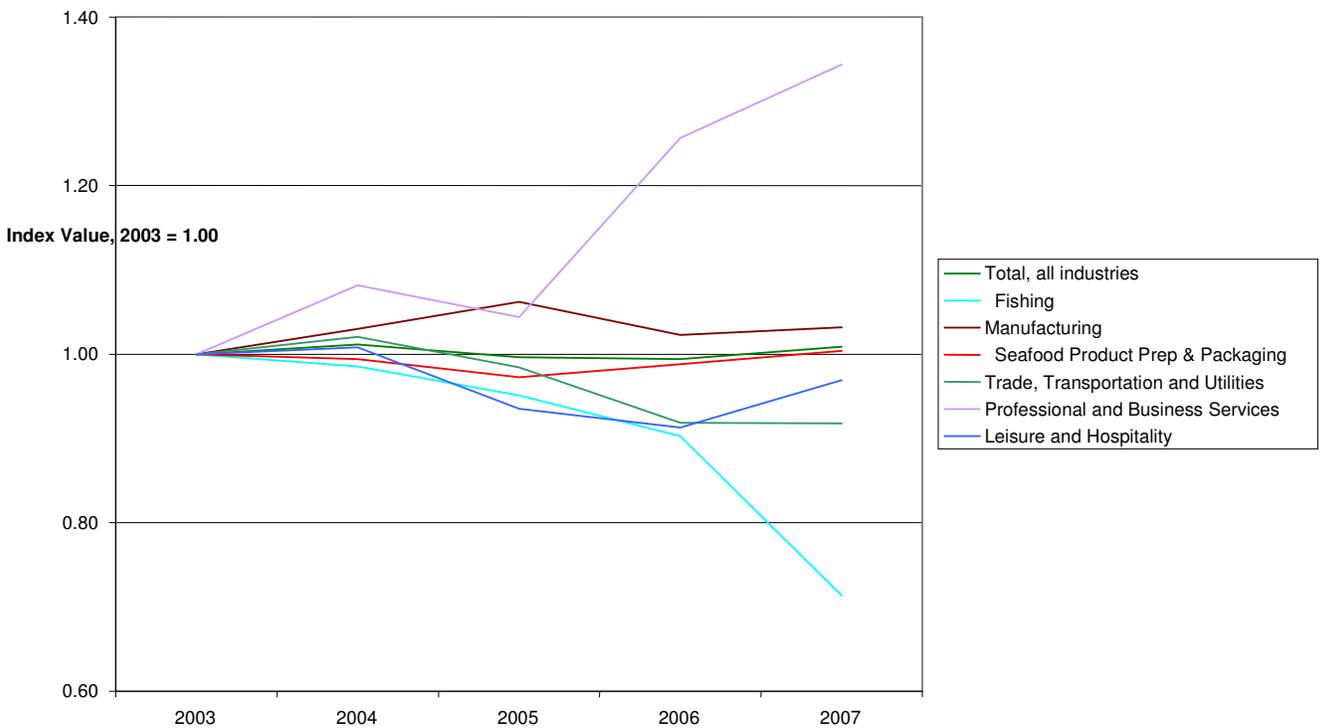
Human development continues to be the ultimate source of water quality problems and the City's coastal areas continue to be among the most densely populated. Gloucester land use research reveals that open space, forest and wetlands occupy over 69% of the total land area within the City.

C.2. Employment Trends and Industry

Economic development is fundamentally about sustaining and building a community’s economic base and, in the process, creating wealth. A community’s “traded sectors” draw income into the community, creating and retaining businesses, jobs, and tax base, and stimulating property investment. The most recent studies provide a picture of the city's economic activity and trends through 2007, before the impact from the current recession.

Chart 2-1 shows employment trends for major sectors in Gloucester while Table 2-4 compares employment growth in Gloucester to the Southern Essex County² region for selected industries.

Chart 2-1. Trends in Gloucester Employment, 2003 to 2007



Major observations from this data include:

- Overall employment was stable with just under 1% growth for the period, comparable to the Southern Essex region (.8%);
- Fish harvesting declined 28.6% with the steepest drop (39 jobs and 21%) in 2007;
- Fish processing employment has been stable for Gloucester;

² The Southern Essex Region includes the following 19 communities: Beverly, Danvers, Essex, Gloucester, Hamilton, Ipswich, Lynn, Lynnfield, Manchester, Marblehead, Middleton, Nahant, Peabody, Rockport, Salem, Saugus, Swampscott, Topsfield, and Wenham

- Manufacturing jobs grew slightly (3.2%) and this sector is the largest part of the city economy with durable goods, particularly machinery manufacturing, the largest component
- Trade, transportation and utilities—the second largest sector—declined, with job losses in both retail and transportation.
- Hospitality declined for both accommodations and restaurants but there was a modest increase in arts and museums/historic sites.
- Growth has largely come from services, especially professional and businesses services, which added 264 jobs from 2003 to 2007—a 34% increase. Most of this growth came from administrative and support services which increased by 110% or 204 jobs.
- Membership organizations were a second key area of growth, adding 75 jobs.

Source: Short-term Real Estate Market Analysis, Gloucester Harbor ED Plan, September 10, 2009 Memo to Peter Kwass of Mt. Auburn Associates

Table 2-4. Employment Change in Selected Industries from 2003 to 2007, Gloucester and Southern Essex County Workforce Investment

Sector/Industry Name	Gloucester	Gloucester	So Essex	So Essex
	Absolute Change	% Change	Absolute Change	% Change
Total, all industries	97	0.90%	1,341	0.8%
Natural Resources and Mining	-62	-28.60%	-76	-12.7%
Agriculture, Forestry, Fishing & Hunting	-66	-30.40%	-60	-11.6%
Fishing	-59	-28.60%	-66	-25.5%
Manufacturing	87	3.20%	-1,130	-5.40%
Durable Goods Manufacturing	201	11.40%	-123	-0.8%
Non-Durable Goods Manufacturing	-114	-12.10%	-1,006	-17.7%
Food Manufacturing	3	0.60%	20	0.9%
Seafood Product Preparation & Packaging	2	0.40%	-45	-6.0%
Trade, Transportation and Utilities	-168	-8.20%	-515	-1.4%
Wholesale Trade	-7	-2%	120	2.0%
Grocery Product Merchant Wholesalers	47	26.70%	-279	-25.6%
Transportation and Warehousing	-73	-13.60%	-137	-4.4%
Professional and Business Services	264	34.40%	743	4.60%
Management & Technical Consulting Svc	26	118.20%	-39	-4.30%
Scientific Research and Development Svc	-28	-65.10%	269	51.10%
Leisure and Hospitality	-37	-3%	-466	-2.50%
Arts, Entertainment, and Recreation	21	11.10%	-344	-9%
Performing Arts and Spectator Sports	2	8.30%	-127	-29.20%
Museums, Parks and Historical Sites	13	43.30%	-1	-2%
Amusement, Gambling & Recreation Ind	7	5.20%	-217	-7.50%
Accommodation and Food Services	-58	-5.60%	-121	-0.80%
Accommodation	-12	-11.20%	-319	-21.70%
Food Services and Drinking Places	-47	-5.10%	198	1.50%

A key to the economic development of Gloucester is the revitalization of Gloucester harbor’s economic base through a strategy focused on three key industry segments — commercial fishing, tourism, and maritime industries.

Commercial Fishing: The commercial fishing industry has been a mainstay of the harbor economy since Gloucester’s founding and is central to the city’s history and culture. In recent

years, the industry has been thrown into a state of deep uncertainty by federal regulations intended to maintain the fisheries at sustainable levels.

Related to recreation, some marina owners express frustration that current Designated Port Area (DPA) regulations require them to maintain commercial dockage in excess of demand, preventing them from expanding recreational uses that could provide increased revenues to offset the lower revenues generated by commercial uses.

Visitor Economy: The harbor's working port and its many historical, cultural, and recreational attractions already make tourism a significant component of the harbor economy. At the same time, it is widely believed that the tourism potential of the harbor has not been fully tapped. This is attributed to a number of factors, including access limitations. Reaching the harbor by land and water, and circulation once there, is difficult. Connecting the downtown and harbor through physical and visual connections will improve the use of both areas and create more of a symbiotic relationship. Physical improvements to and infill development along Rogers Street and creation of a continuous harbor walk with connections to the downtown will significantly enhance the identity and visitor experience of the harbor and the central business district as outlined in more detail below.

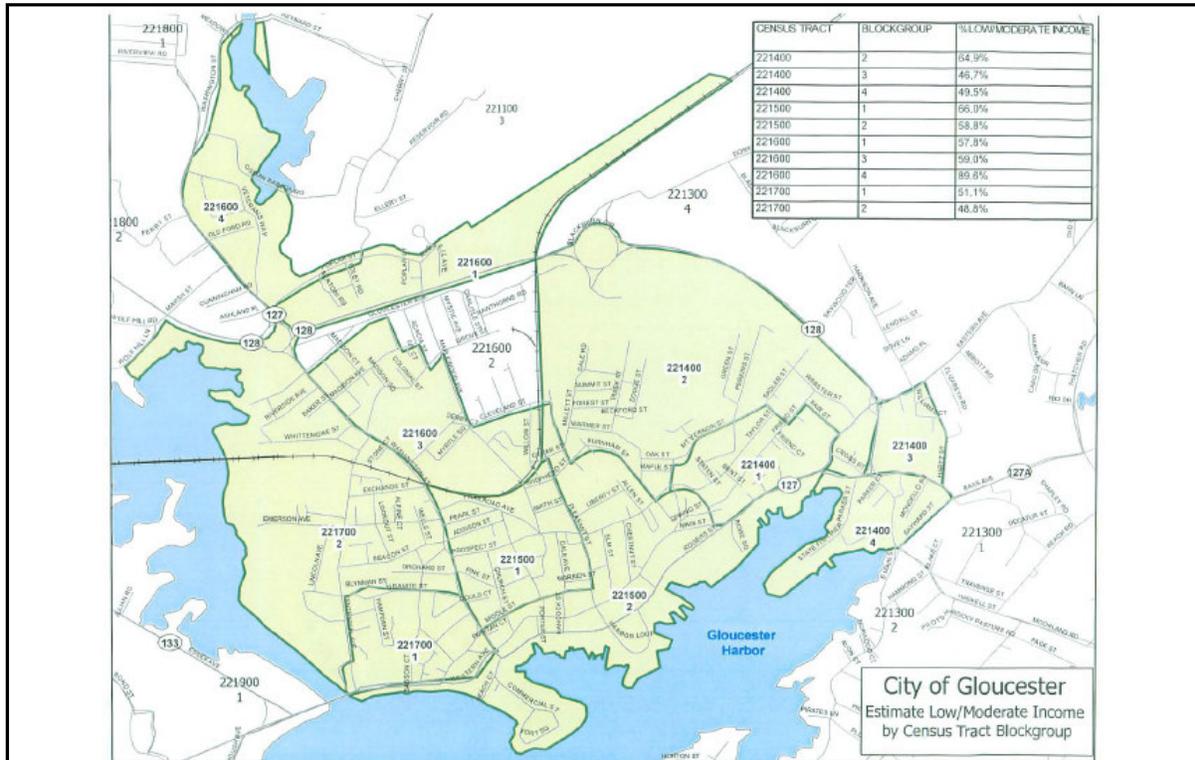
Maritime Industry: the maritime industry provides concrete growth opportunities for Gloucester in marine research and education as well as marine industries such as advanced boat building, aquaculture, and marine alternative energy.

Industrial Parks: Gloucester's recent economic growth has primarily occurred in industrial parks developed through Gloucester's Economic Development and Industrial Corporation (EDIC) that formed in 1977. The EDIC has led efforts to develop the Pond Road, Blackburn and Kettle Cove Industrial Parks. These parks have nearly reached their capacities and there is interest in expanding the land area or developing new areas, in particular around Kettle Cove in West Gloucester. Any expansion or new area would likely involve clearing of currently undeveloped land. There is a very preliminary conceptual plan for expanding the industrial park. Access would be via Kondelin Road and a new Route 128 interchange.

C.3. Environmental Justice Community

Figure 4 shows the low and moderate income areas in Gloucester according to the 2000 census. The City can target Community Development Block Grant (CDBG) funds to improve these areas. Many cities use CDBG funds as matches for PARC and LWCF grants.

Figure 4: Low and Moderate Income Areas in Gloucester (2000 Census)



As mentioned in Section 2 C. the low income communities are concentrated in Downtown Gloucester near City Hall and the Riverdale area along Washington Street qualify as environmental justice populations.

Low-income residents make up the majority of Census Tract Blockgroups 221600-4, 221600-1 (Riverdale area) and 221500-1 (Downtown). The Riverdale area has a large population of young families with low-income, children under 18 make-up over 40% of the population in blockgroup 221600-4 compared to 12% city-wide. The city’s largest family-orientated low-income housing development, Riverdale Park sits in this blockgroup. This is an active community with a tot-lot and community garden.



Guard rail blocking access to fields near Riverdale

This development sits near recreational fields and the City's skate park; however, the most direct access requires Riverdale residents to hop over a guard rail and walk in the middle of the street

Residents over age 65 comprise nearly 25% of the population of Downtown EJ area compared to 11% city-wide. This reflects the concentration of residents in several senior apartment complexes in this area including several complexes along Prospect, Pleasant and Maplewood Streets owned and operated by the Gloucester Housing Authority. The Downtown EJ area also has a higher percentage children under 18, nearly 19%, as compared to 12% city-wide perhaps due to the availability of affordable older homes and apartment units that accommodate families.

D. GROWTH AND DEVELOPMENT PATTERNS

D.1. Patterns and Trends

The Atlantic Ocean continues to play a major role in the influence of Gloucester's business, industry and recreation. The wetlands, watershed areas, and shoreline are critical ecologic and economic resources. The resources need to be preserved for aesthetic, economic, recreational and cultural reasons. Boating, fishing, shell fishing and other water-related activities available in Gloucester provide not only recreation for the locals and tourists but also provide livelihoods and a way of life for many local families.

The historic settlement pattern of Gloucester concentrated homes and the fishing industry along the rocky shoreline that rings the interior woodlands and ponds of Gloucester. The interior woodlands and ponds now comprise most of Gloucester's drinking watershed so the historic and existing settlement pattern will continue into the future, preserving Gloucester's coastal neighborhoods and the upland water supply infrastructure that serves them.

Gloucester's villages and neighborhoods have a rich and fascinating history. Each neighborhood has its own character and special features. Many locals are fiercely proud of those differences. Annisquam, Plum Cove and Lanesville are small villages that run along Ipswich Bay from the Riverdale neighborhood north of Route 128. East Gloucester consists of a peninsula that creates the eastern edge of Gloucester Harbor and includes Rocky Neck, the mansions of Eastern Point and the rocky "Back Shore". Magnolia in West Gloucester began as a resort area catering to Boston tourists and has evolved into a bedroom village. The rest of West Gloucester (aka West Parish) primarily consists of protected woodlands and less developed residential tracts served by septic systems.

D.2. Infrastructure

D.2.a. *Transportation Networks*

Historically, Gloucester Harbor served as the hub of transportation activity which in turn bolstered development of the downtown area. Rail transportation developed early and brought goods in and out of Gloucester. It also brought tourists to areas such as Annisquam and Magnolia.

Improved roads spurred the rate of growth and helped disperse residential development away from the center city. Construction of Route 128 has had a tremendous impact on the City, facilitating commuting, tourism and commerce. Traffic over the Annisquam Bridge varies from 30,000 vehicles during the school year to 40,000 vehicles a day in the summer months (due to the increase in summer population). Traffic overwhelms the main roads during commute hours and during the summer. Traffic congestion, narrow road widths and a lack of off-road paths and sidewalks discourages walking and bicycling to popular destinations such as Good Harbor and Wingaersheek beaches, especially for casual bicyclists and family groups and between neighborhoods, beaches, villages and downtown. The congestion also contributed to the failure of past attempts to run shuttles from Stage Fort Park and the MBTA and Rocky Neck because the shuttles became in stuck traffic and could not follow a regular schedule. The Stage Fort Park shuttle was revived pursuant to a Clean Air and Mobility Program grant in 2010 and serviced over 1500 riders in summer 2010. New trolley stops will be added in 2011 at the Gloucester MBTA station and Rocky Neck.

With the exception of Route 128, Cape Ann's roads consist primarily of two lane roads. Even state roads such as Route 127, 127A and 133 have stretches that are narrow by current road building standards. The Annisquam River, rocky terrain, water supply protections and other environmental constraints make the development of additional major roads unlikely and the widening of existing roads expensive.

D.2.b. *Public Transportation*

Cape Ann is served by two complimentary public transportation systems, the Massachusetts Bay Transportation Authority’s (MBTA) Commuter Rail service and the Cape Ann Transportation Association (CATA) bus system. Figure 5 maps MBTA and CATA lines.

The MBTA Commuter Rail service runs seven days a week between Rockport and North Station in Boston and includes stops in Downtown Gloucester and West Gloucester. Trains provide service 13 times per day on weekdays and 7 times per day on weekends. On summer weekends, the trains include a bicycle car that provides more capacity for rail customers to access the North Shore by bicycle. CATA revived the Stage Fort trolley this summer.

CATA serves the communities of Gloucester, Rockport, Essex and Ipswich with special service to Peabody and Danver. CATA runs 6 bus lines around Cape Ann through Gloucester with Downtown Gloucester serving as a hub. CATA allows riders to stop and be picked up between regular stops by signaling the bus driver. Recreational destinations that can be reached by bus include Stage Fort Park / Stacy Boulevard and Good Harbor Beach

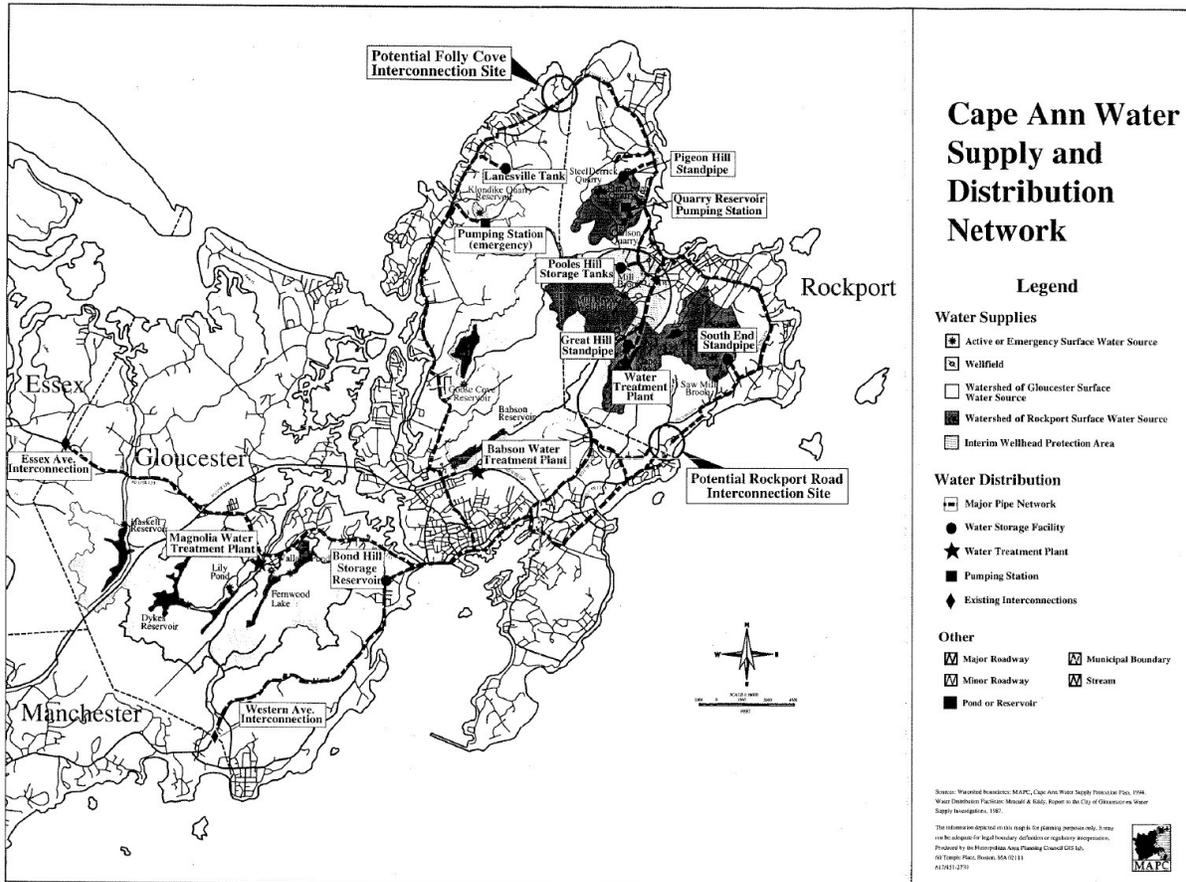


Figure 5 - CATA Bus Routes and MBTA Rail Stops

D.2.c. *Water Supply Systems*

Surface reservoirs and their watersheds serve as the major source of municipal water supply. There are seven primary reservoirs and three emergency or secondary sources of water. This amounts to 3,770 acres of watershed or more than 22% of Gloucester's total corporate land area. The City presently owns approximately 80 percent of these watershed areas with the remaining watershed land in private ownership (see Table 2-5).

Figure 6: Gloucester's Water Supply System (from MAPC Study)



Downtown Gloucester, parts of East and West Gloucester and the Wheeler Point, Bay View, Riverdale and Annisquam neighborhoods have public water. Most Gloucester residents in other areas use public water although a few neighborhoods rely on seasonal public water or wells. Although the City has extensive water reservoirs, the city's water system has deficiencies in supply, treatment and distribution. After a breakdown in water delivery in 2009 that forced a month-long boil-water order, the city has initiated multi-million upgrades to its water treatment systems at both the Babson and West Gloucester Reservoirs

Contamination of the sources of water supply always remains a threat. Route 128 cuts through a portion of water supply land in West Gloucester. Control of and regulation of activities on water supply lands has not been reviewed in the past decade. The 1994 MAPC

Water Supply Protection Plan is the last comprehensive study of water supply protection in Cape Ann. Based on City Assessor's 2009 Parcel information and Zone B watershed areas approximated by MassGIS Table 2-5 shows the percentage of land within public water supply areas controlled by the City or non-profit conservation organizations:

Table 2-5 – Percent Public Ownership of Water Supply Watershed Lands

Watershed	Area (acres)	Percent Public Ownership
Babson	420.0	93%
Dyke's	431.3	100%
Fernwood Lake	245.4	96%
Goose Cove	267.1	98%
Haskell's	410.5	96%
Klondike	75.6	60%
Lily Pond	326.5	91%
Wallace	171.4	89%

Much of the private acreage is surrounded entirely by City property and consists of long, narrow woodlots that lack the necessary frontage and setbacks to be developable. Gloucester has adopted a Watershed Protection Overlay district that requires development in water supply areas to meet additional requirements such as providing sewer extensions.

D.3. Long Term Development Patterns

D.3.a. General Zoning Districts

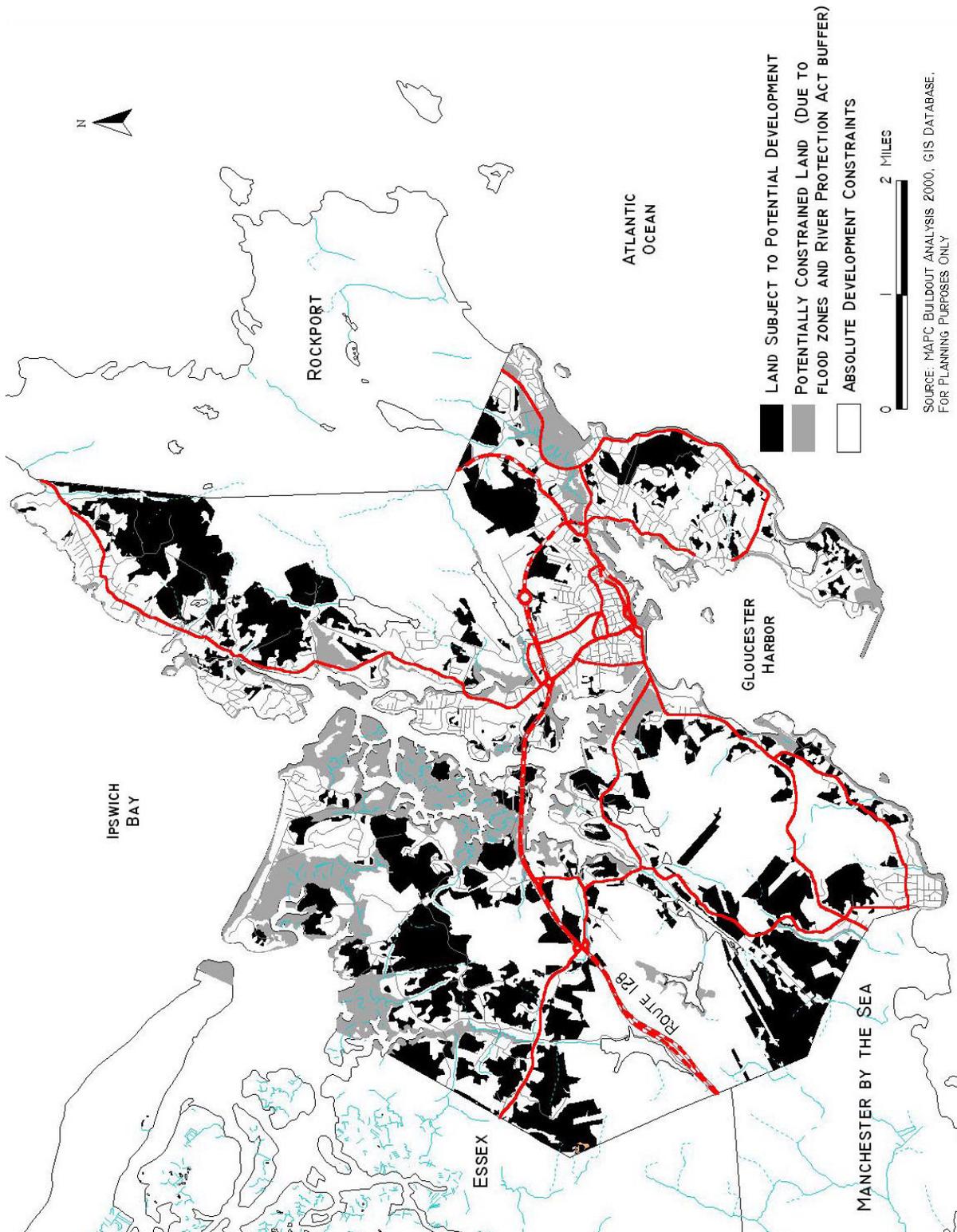
Figure 7 shows Gloucester's current zoning districts. Zoning promotes the health, safety, and general welfare of the public by regulating the density and use of land. Zoning can foster the creation or preservation of open space and conservation land by restricting the active use of land that is inappropriate for development, such as wetlands, designated parks, beaches, etc. Gloucester's land is pre-dominantly devoted to open space and residential use.

Development pressure and demand for housing were strong in the entire North Shore region in the past decade and residential building remains active in Gloucester despite the current recession. Gloucester is a particular target for this demand, in large part because of the natural beauty of its geography and the waterfront views and locations. During strong housing markets, more residential infill development occurs when home prices become high enough to off-set greater cost preparation costs (e.g. removal of ledge and drainage improvements). Figure 8 shows areas of potential future development. Substantial tracts of open land near interior woodlands remain available for residential development in the R-80 zones in West Gloucester between Route 128 and the Essex town line, North Gloucester above Dogtown and between Ravenswood Park and the Manchester by the Sea town line.

As is true of most communities, current zoning sets aside a relatively small amount of land for commercial uses. Land in the Blackburn Industrial Park, Kondelin Road Industrial Park and Morse Industrial Park on Pond Road, has been built out over the past several decades. Undeveloped land zoned commercial and industrial exists northwest of Kondelin Road in West Gloucester.

The City implemented zoning changes proposed in the 1998 Open Space & Recreation Plan that increased lot sizes in the less developed areas in West Gloucester and in the north Gloucester woods to two acres, but strategic planning was not conducted for the preservation of historic access from the north Gloucester villages to nearby woods and Dogtown.

Figure 8 – Potential Build-out in Gloucester (From Plan 2001)



D.3.b. *Harbor Plan and Zoning (from the 2009 Harbor Plan)*

The bulk of Gloucester's homes and businesses are concentrated upland of Gloucester's inner harbor. The harbor area continues to be a vital center for the fishing and maritime industries in the City. The City's 2009 Harbor Plan envisions the Harbor as a place where residents can live and work and where both residents and tourists alike can visit and appreciate the diverse mix of open space and work areas along the Harbor. Figure 9 shows the limits of the Designated Port Area and delineated local zoning districts.

Excerpts from the 2009 Harbor Plan:

The 2009 Harbor Plan envisions that by the year 2020...

The skills and physical resources of the Gloucester community have provided the natural building blocks for new maritime economies. Long-time fishermen, tradesmen, sailors, boatwrights, divers and researchers supply the generational knowledge of ocean habitats which serves as a catalyst for the expansion of commercial ocean harvesting...

Gloucester school children benefit from harbor commerce as their parents work in and around the waterfront in growing numbers, as streets and public walkways connect more directly the city to the harbor, as the schools find new opportunities to connect classroom lessons with the maritime capital found on the docks and the boats and the labs that support the harbor economy...

Bustling maritime commerce requires hotels, restaurants, and retail shops for the workers and the many visitors who seek the experiential connection to a vibrant working waterfront and visitor amenities. Along the waterfront an esplanade weaves in and along and through the myriad industries and commerce. ...The port welcomes those who arrive by boat. ... The downtown is busy and engaging.

2009 Harbor Plan Goals related to Open Space and Recreation propose to:

- Make the harbor a hub of community activity.
- Provide access to, along, and across the water.
- Create public access along the waterfront as shown by harbor walks and connections.
- Provide ways that citizens, especially our youth, can both get to and onto the water.
- Increase citizen access to boating: increase moorings, dinghy docks.
- Mix recreational and commercial boating in ways that would create compatible boating activity in the harbor.
- Encourage access by water with abundant temporary public slips.
- Ensure that harbor development respects the heritage of Gloucester: fishing, arts, the scale of the community, preservation.
- Develop effective design and architectural review.
- Make the harbor accessible to the public.
- Consider traffic and parking needs.
- Recognize and link historic focal points.

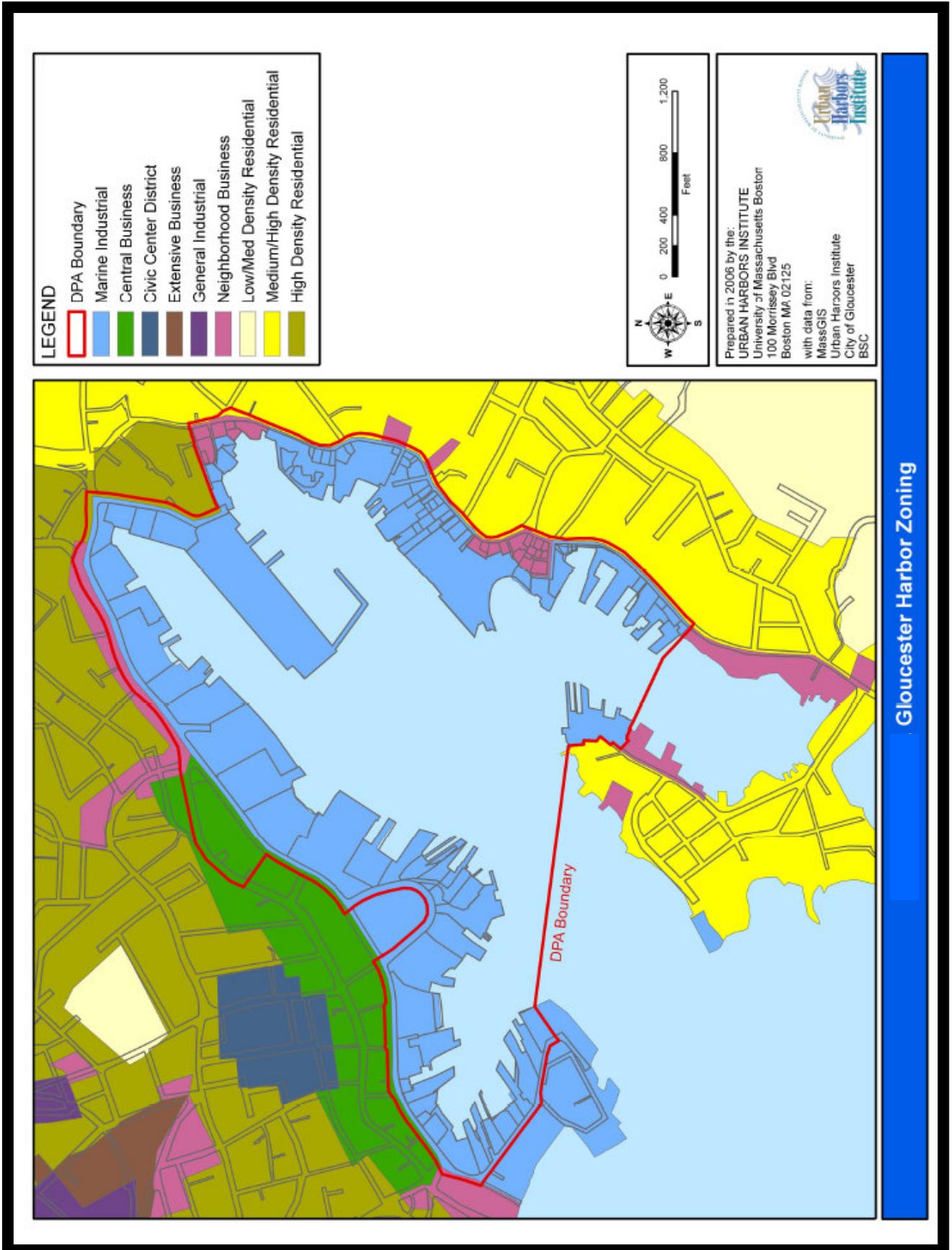


Figure 9 – Gloucester Harbor Zoning and Designated Port Area Boundary

E. REGIONAL OPEN SPACE AND RELATED PLANS

E.1. MAPC MetroFuture Plan



The City of Gloucester is part of the Metropolitan Area Planning Council region that covers 101 communities from Cape Ann to Interstate 495 in the west and Duxbury in the South. The Metropolitan Area Planning Council

(MAPC) is a regional planning agency serving the people who live and work in Metropolitan Boston. Gloucester is part of the North Shore Task Force subregion of the MAPC. MAPC’s mission is to promote smart growth and regional cooperation, which includes protecting the environment, supporting economic development, encouraging sustainable land use, improving transportation, bolstering affordable housing, ensuring public safety, advancing equity and opportunity among people of all backgrounds, and fostering collaboration among municipalities.

In 2009 MAPC developed its MetroFuture plan that includes goals related to a Healthy Environment and Conservation.

Specific Goals of the MetroFuture related to Open Space seek to protect:

- the region’s rivers, streams, lakes, and ponds by minimizing excess stormwater runoff and other pollution especially in water supply areas.
- the ecological condition of wetlands and biodiversity by directing growth away from wetlands and floodplain areas, resulting in less development in or near wetlands.

MetroFuture also seeks to encourage a robust network of protected open spaces, farms, parks, and greenways that will provide wildlife habitat, ecological benefits, recreational opportunities, and scenic beauty.

E.2. Trustees of Reservations 2017 Strategic Plan

The Trustees of Reservations preserve, for public use and enjoyment, properties of exceptional scenic, historic, and ecological value in Massachusetts. TTOR cares for 400+ acres of land in Gloucester including Ravenswood Park.

TTOR has developed a 2017 Strategic Plan that includes the following priorities:

- Use our reservations to engage more people in conservation.
- Increase our investment in resource protection and visitor services, focusing on projects where there is an intersection of high-priority needs and opportunity to engage people and build capacity to address these projects.

To that end, TTOR recently opened an education center in Ravenswood.

E.3. Essex County Greenbelt Association

The Essex County Greenbelt Association is a member-supported nonprofit land trust that has conserved nearly 13,000 acres of land in Essex County. Greenbelt works with local communities and landowners to acquire and protect significant ecological areas, farmland and scenic vistas. One of its major goals is the creation of "greenbelts" consisting of river, trail, and other natural corridors, coastal systems and visually intact landscapes. Properties include the Carter and Goose Cove Reservations near Dogtown, Stoney Cove, Presson Point and Tompson Street Reservations in West Gloucester and Seine Field in East Gloucester.

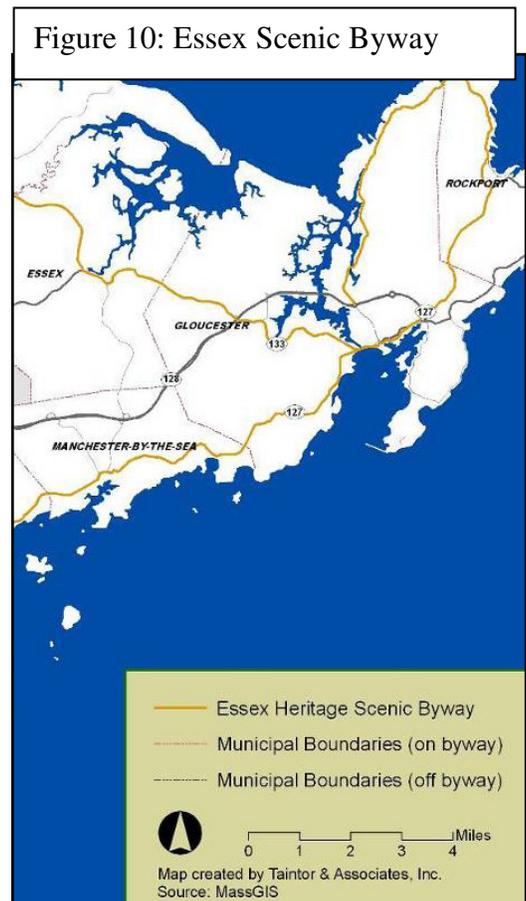


E.4. Essex National Heritage Area Plan and the Essex Heritage Scenic Byway

Designated in 1996 by the U.S. Congress, the Essex National Heritage Area (ENHA) covers the 500 square miles of eastern Massachusetts that lie north of Boston. The ENHA encourages resident and visitors to explore local historic cities and towns and natural areas and hear the stories of the people and the land.

The Essex National Heritage Commission (ENHC) is the non-profit management organization for the ENHA. The Commission's mission is to promote and preserve the historic, cultural and natural resources of the ENHA. ENHA has a visitor center in Gloucester.

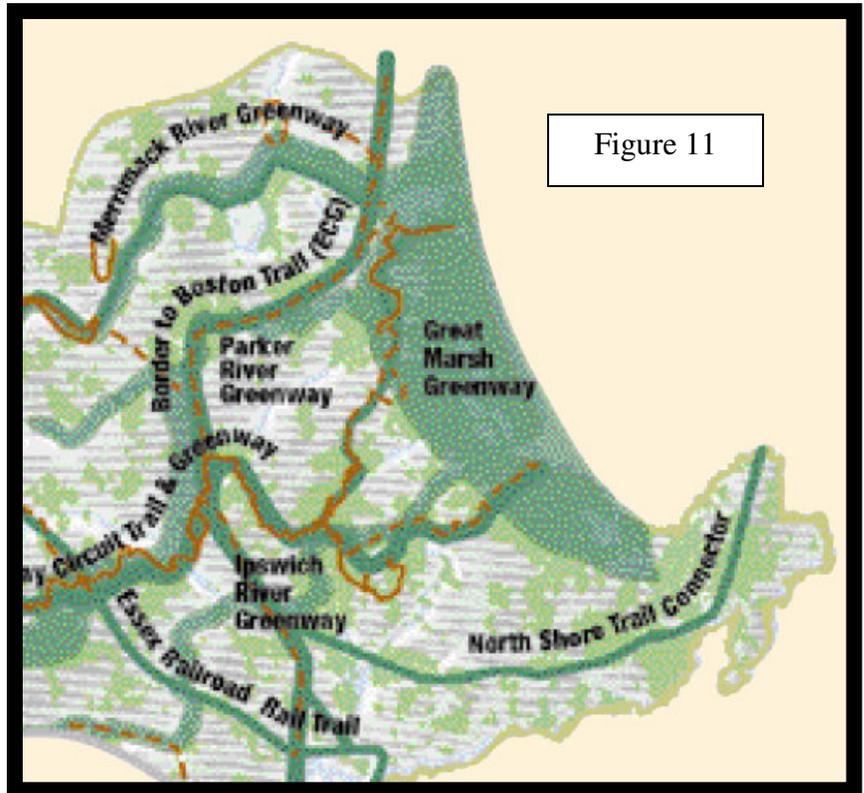
ENHC oversees the establishment of the Essex Heritage Scenic Byway. The Byway will extend through Essex County from Lynn to Salisbury including Routes 127, 127A and 133 in Gloucester. Travelers along the 64-mile Essex Heritage Scenic Byway will experience much of what New England has to offer: historic seaports, colonial era farms, village and city centers, and a wealth of period architecture. Together, the 13 byway communities contain over 8700 properties listed in the National Register of Historic Places as well as several National Historic Landmark properties.



E.5. Recreational Trail Connections

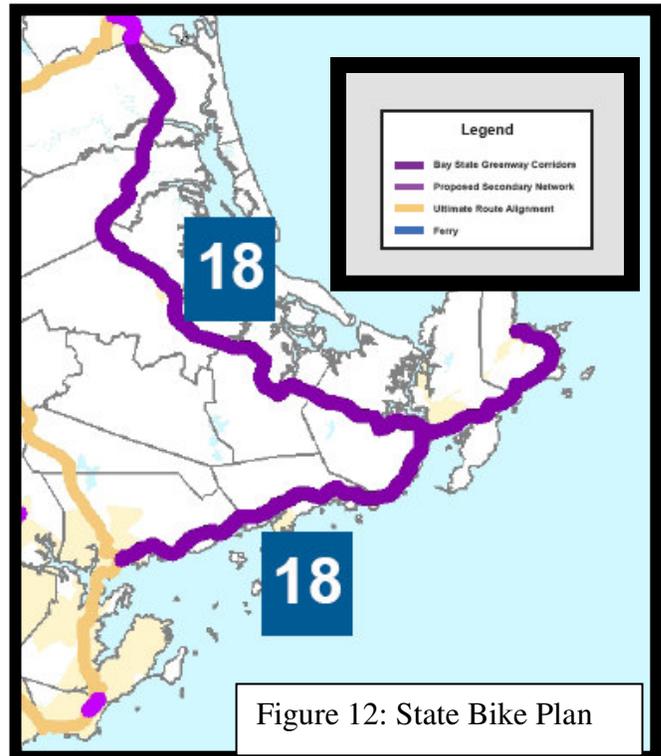
E.5.a. North Shore Connector Trail

In 2002, the Department of Environmental Management (now Department of Conservation and Recreation) developed a statewide vision to a greenway network in its Commonwealth Connections Plan. The vision included a conceptual proposal for a “North Shore Connector Trail” that would link the Border to Boston segment of the East Coast Greenway to Cape Ann.



E.5.b. Massachusetts State Bicycle Plan

The 2008 Massachusetts Bicycle Plan includes on-road bicycle routes that extend to Cape Ann including Route 133 and Route 127/127A.

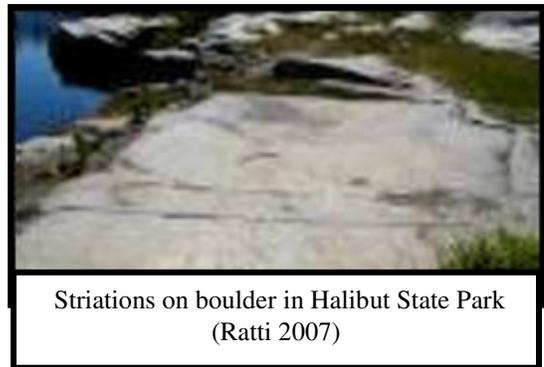


SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS

A. GEOLOGY, SOILS, AND TOPOGRAPHY

From LAURENTIDE GLACIATION OF THE MASSACHUSETTS COAST, Margaret Martin, Student, ES 767, Quaternary Geology, Fall 2008 for Professor James S. Aber, Earth Science Dept., Emporia State College, Kansas. See that article for additional references
URL: <http://www.emporia.edu/earthsci/student/martin1/laurentide.html> (2-4-2010)

The Cape Ann peninsula, bordering the western Gulf of Maine, is comprised of rocky headlands and islands. The bedrock of the area consists of faulted Paleozoic intrusive rocks. Massive intrusive granite is exposed at the surface and the rocky coast is indented with small harbors and beaches. Thin, discontinuous glacial deposits cover the bedrock. The granite of the Cape Ann peninsula is extremely dense and was once valued for quarrying. The unique density of this granite is due to the overlying pressure of the sedimentary rock that once covered the bedrock. The retreating Laurentide ice sheet eroded the sedimentary rock overlying the granite about 15,000 years ago and brought the granite close to the surface. Evidence of glacial erosion is seen in the striations on a boulder at Halibut State Park on the Cape Ann peninsula (photo).



The Cape Ann peninsula is a terminal moraine. The melting ice sheet left behind extensive areas of rocky debris including huge erratic boulders, some carried by the glacier from Newfoundland. In addition to the rocky debris, drumlins of molded till and eskers are common in the area (Essex Greenbelt, 2008). As the glacier wasted away large areas of rocky glacial till was deposited in the region. The Dogtown Common area of central Gloucester is littered with the rocks and boulders of the terminal moraine. This 1600-hectare site, once a prosperous settlement in the late 1600s, is now protected as a municipal watershed. The site includes unusual erratic and remnants of the terminal moraine.

As the ice sheet began its retreat from the area, the sea transgressed inland. When the ocean reached about 33 m above present sea level, lowlands were flooded and the Cape Ann Peninsula became an island. Glacial meltwater plumes deposited large quantities of glacial-marine sediments onto the ice-marginal ocean floor.

The inland portion of Cape Ann has a poor drainage system due to glacial debris blocking and overloading streams on the outwash terrain. Kettle holes, formed from melted ice blocks, and kames are evident in this area (See Figure 13 – Surficial Geology).

Three of the most common types of soil in Gloucester are the Chatfield-Hollis-Rock outcrop, Annisquam soil and Freetown muck soils as defined by the U.S. Soil Conservation Service's Soil Survey of Essex County (Figure 14 – NRCS Soils).

The Chatfield-Hollis Rock outcrop soil consists of moderately well-drained soils with well drained, shallow Hollis soils and exposed bedrock. The Hollis soils are not suited to trees while the Chatfield soils are apt to be forested. Sugar maples, red oaks, white ash and eastern pine populate these soils. Both soil types are poorly suited to agriculture according to the Soil Conservation Service. Similarly these soils are not suitable for recreational facilities such as golf courses or playgrounds, but offer interesting terrain for hiking. Also, these soils are not prone to erosion and thus hiking does not pose a significant hazard. The Freetown muck soils are found along poorly drained areas and stream beds. Red maples, eastern hemlock, green ash, red spruce and Atlantic white cedar can be found in Freetown muck soils. They offer some woodland habitat for animals but substantial habitat for wetlands wildlife.

B. LANDSCAPE CHARACTER

Gloucester covers most of the Cape Ann peninsula with 25.97 square miles. Open space and forest comprise 59.7% and wetlands 9.6% of the total land within Gloucester. Open space includes forest and areas of natural vegetation, recreation areas and undeveloped area of natural vegetation, undeveloped urban and natural lands. Specific land types include 212 acres of inland wetlands, 878 acres of coastal wetlands, 37 acres of pasture land and 7 acres of crop land. Residential homes comprise 1/4 of the land use with the majority single-family dwellings.

Gloucester's visual character is one of its most priceless assets. The diversity of landforms of marsh, beach, rocky harbor and its waterfront and the diversity of structures, new and old, add to the uniqueness and richness of Gloucester's character. The city has long provided remarkable landscapes for painters and continues to be relatively undeveloped.

Gloucester's landscape contains a good deal of variety: rocky intertidal zones along the coast in Magnolia and Lanesville; four barrier beaches; significant salt marsh, successional forest and inland wetlands. In the center of Cape Ann, Dogtown Common straddles Gloucester and Rockport. This rugged landscape was carved out by the glaciers during the last ice age.

The centerpiece of Gloucester's waterfront has always been its inner harbor. Protected from Atlantic storms, it is a natural haven close to some of the most productive fishing grounds in the world. Fishing fleets filled the harbor and created the wealth that built the land-side community. The designation of an Historic District in the downtown section has helped to preserve many of the City's traditional architectural character.

The public desire to access scenic waterfront areas can conflict with private property rights. Although some public open space remains near private residences, abutters often take action to discourage public access to the water's edge in many locations.



C. WATER RESOURCES

C.1. Watersheds and Surface Waters (See Figure 15)

The North Coastal Basin is a study in diversity, not only with respect to topographical features but also with respect to human influences. The North Coastal Basin includes portions of Salisbury and Amesbury which drain north into New Hampshire, communities on Cape Ann and coastal and near shore communities south to Revere/Everett. All or portions of 27 communities distributed over 168 square miles make up the North Coastal Basin.

Gloucester has approximately 1,263 acres of surface water which is equivalent to 7.4 percent of its total acreage. Much of this acreage serves as the City's source of potable water and is associated with water supply reservoirs. More than 22 percent of Gloucester's total land area is watershed, draining into seven primary reservoirs. Much of this watershed land is owned by the City with restrictions on the type of land use. A number of smaller fresh water ponds or impoundments are located throughout Gloucester. These include Niles Pond, West Pond, Langsford Pond, Upper and Lower Banjo Ponds and many small water-filled quarries in the Lanesville section of the City. These areas are often used for swimming, fishing, ice-skating and other recreational activities. (See Gloucester's Water Supply System map – Figure 6 in Section 2)

C.2. Rivers

The Annisquam River is important to Gloucester's unique coastal character. The Annisquam and its tributaries including the Mill River and Little River are strongly tidal influenced with conditions that are primarily characteristic of salt water environments. The river and its tributaries provide a highly valued environment linked to its ecology. The shellfish beds, for example, are vital and irreplaceable resources that require protection. The wetlands along its edges are more than picturesque; they play a key role in the sensitive coastal ecology. At the same time, the river and the coves along its edges serve a large recreational boating population with many marinas and moorings.

C.3. Aquifer Recharge Areas

Gloucester obtains its water from surface water supplies so it does not maintain aquifer recharge areas.

C.4. Wetlands

Almost 10 percent of the area in Gloucester is classified as wetlands, both fresh and salt water, including much of the area bordering the Annisquam River and the beach areas. A portion of this land in Gloucester is designated as an Area of Critical Environmental Concern (ACEC), including marshes and clams flats that are among the most pristine in the state (Figure 16). Wetlands, especially marshes, are an important visual resource, adding a rich dimension to the beauty of Gloucester.

Salt marshes are among the most biologically productive lands on earth, with two-thirds of all marine fish and shellfish depending on them during some part of their life cycle. The two largest salt marsh systems in Gloucester lie in Essex Bay and along the Annisquam River. A smaller area lies behind Good Harbor Beach, and a few other small areas are found along Mill River, Little River and Dolliver Beach. These marshes are valued for their productivity. Many of the fish caught in deep waters use these marshes as nurseries. Cod, pollock, haddock and striped bass are all found in Annisquam River Marshes.

Wetlands have important functions in both the man-made and natural environments such as:

- moderating both in-land and coastal flooding;
- serving as wildlife habitat and improving wildlife productivity;
- providing scenic vistas of land and sea;
- maintaining and improving water quality by trapping silt and organic matter;
- replenishing groundwater; and
- providing open space and recreation for various public uses such as nature study, canoeing, photography and other forms of passive recreation.

Diversity of wetland types and variations within individual wetland areas may result in the occurrence of one, many or none of these values. The actual wetland function and value depends upon location, topography, subsurface geology, hydrology, vegetative types and use.

D. VEGETATION

D.1. General Inventory

For a densely settled city with a large urban core, Gloucester is fortunate to have retained extensive natural areas of native vegetation, protected as public lands and by private conservation organizations. From an ecological perspective, it is especially fortunate that the city's inventory of relatively undisturbed open spaces contains some extensive, unfragmented parcels. The entire core of the Cape Ann peninsula is a roadless wilderness known as Dogtown, most of which lies within Gloucester's boundaries; city watershed land comprises over 3500 acres, c.90% in public ownership; the 600+ acre Ravenswood Park is managed by the Trustees of Reservations; and smaller but ecologically significant reserves in other parts of the city are protected and managed by Mass Audubon and Essex County Greenbelt.

In addition to their extent, these protected areas are notable for their ecological diversity, which derives mainly from (1) the area's varied topography resulting from the advance and retreat of the most recent glacial period (110,000-10,000 y.a.) and (2) the fact that the city is nearly surrounded by the sea. The character of the plant communities, i.e. their species composition, derives mainly from the acidic (e.g. granitic) soils on which they grow. It is possible to discern more than thirty distinct natural communities in Gloucester following the definitions based on vegetation characteristics in the *Classification of the Natural Communities of Massachusetts* (Swain and Kearsley, Massachusetts Natural Heritage and Endangered Species Program, 2000).

The most extensive and/or significant of these communities are as follows:

D.2. Forests and Woodlands

Oak-Hemlock-White Pine Forest. This is the most widespread upland forest type in Gloucester and indeed throughout much of the Southern New England Coastal Plain and Hills Ecoregion of which the city is at the northeastern-most extremity. It consists of tall trees with a largely closed canopy and a sparse and patchy shrub layer. Dominant trees (occurring in varying densities at different sites include Eastern Hemlock (*Tsuga canadensis*), White Pine (*Pinus strobus*) species of oaks, especially Red Oak (*Quercus rubra*), Black Birch (*Betula lenta*), Black Cherry (*Prunus serotina*), and Red Maple (*Acer rubrum*). Typical shrubs are Witch-Hazel (*Hamamelis virginiana*), Lowbush Blueberry (*Vaccinium angustifolium*) and viburnums. Herbaceous species such as Wintergreen (*Gaultheria procumbens*), Star Flower (*Trientalis borealis*), and Canada Mayflower (*Maianthemum canadense*) occur where the sun reaches the forest floor.

In some places especially on well drained soils on west- and south-facing slopes, there is a transition to something approaching ***Oak-Hickory Woodland*** with more White Oaks (*Quercus alba*), Hickory (*Carya*) species and Sassafras (*Sassafras albidum*), and associated shrubs and forbs. And there are also limited areas near the shore that conform to Swain & Kearsley's ***Coastal*** and ***Maritime Woodlands*** with their progressively shorter stature, open canopies and often dense layer of shrubs and vines.

Though Gloucester's mixed upland forests and woodlands are known to harbor only one listed plant species (Dwarf Rattlesnake-plantain – *Goodyera repens*), the most mature and robust examples are home to some of the city's most localized breeding bird species, e.g. Saw-whet Owl, Pileated Woodpecker, Wood and Hermit Thrushes, Black-throated Green Warbler and Scarlet Tanager. They are typical sites for Gloucester's many vernal pools.

Pitch Pine-Oak Communities. Historically the dunes at Good Harbor Beach supported what was undoubtedly a ***Maritime Pitch Pine*** stand, but the trees had been cut by 1750 (*fide* Garland, 1990). Presently, scattered patches of Pitch Pine (*Pinus rigida*) occur on granite balds, in dunes at Coffins Beach and in the sandier, better-drained areas of Dogtown where they occur with Scrub and Dwarf Chinquapin Oaks (*Quercus ilicifolia* and *Q. prinoides*). These hardly constitute “woodlands” but are nevertheless distinctive elements of Gloucester's plant community. See also under **Open/Successional Communities**, below.

D.3. Open/Successional Communities.

These are plant communities that are maintained in a natural open state due to very poor soils or environmental stresses such as salt spray and wind OR communities subject to gradual succession to more robust formations but often retarded by periodic fires, storm damage or other forces. During the agricultural period of the 18th and 19th centuries, much of Gloucester's landscape was cleared for sheep grazing and small farmsteads, resulting in an early successional formation dominated by ericaceous shrubs and grasses. Because of Gloucester's exceedingly thin and poor acidic soils, this heathland formation (which came to be known as Gloucester Moorland) has persisted in some areas even to the present, though it is now vanishing due to natural encroachment by taller shrubs. In earlier times these heathlands, which are prone to fire, would have been maintained to some degree by lightning strikes or by fires deliberately set by Native Americans or, most recently, by sheep grazing. Among the dominant “heaths” are the blueberries and huckleberries, well known to many Gloucester natives. This is a highly distinctive aspect of Gloucester's vegetation, and consideration should be given to creating an active management regime to restore these historic, but dwindling plant communities in certain areas.

Depending on depth, and type of soil, successional communities occur in several forms in Gloucester:

Acidic Rocky Summit. So-called “balds,” areas of exposed granite bedrock with small trees, shrubs and forbs occurring in scattered patches of thin soil, are frequent at the tops of the higher elevations in Gloucester such as Mt. Ann, Thompson's Mountain and Pole's Hill (Sunset Rock). And similar plant communities are found where areas of granite occur at the surface such as in much of Dogtown and East Gloucester. Typical plants of these areas include: Pitch pine (*Pinus rigida*), Scrub Oak (*Quercus ilicifolia*) Black Huckleberry (*Gaylussacia baccata*), Lowbush Blueberry (*Vaccinium angustifolium*), Black Chokeberry (*Aronia melanocarpa*), Running Shadbush (*Amelanchier stolonifera*), Bearberry (*Arctostaphylos uva-ursi*) (very local), Three-toothed Cinqufoil (*Sibbaldiopsis [Potentilla] tridentate*), Cow Wheat (*Melampyrum lineare*), and Common Hair Grass (*Deschampsia flexuosa*). Species of mosses and lichens are also common on rock and in soil pockets.

This community intergrades in places with the *Maritime Shrubland Community* and the *Ridgetop Pitch Pine-Scrub Oak Community* (see below)

This is the habitat of the State Threatened Hentz's Redbelly Tiger Beetle (*Cicindela rufiventris hentzii*), though the presence of this species has not been confirmed recently and the record is considered Historical.

These areas tend to command spectacular views and because of their openness are attractive to young revelers which can lead to trampling of the vegetation. The opposite threat, encroachment of the open area by trees, is undoubtedly even greater.

Maritime Shrubland Community. This is the plant community known locally as "Gloucester Moorland." It typically occurs within smelling distance of the sea, but is not usually in the salt spray zone except during storms. In Gloucester, it tends to be a patchwork of dense shrubs including, Black Huckleberry (*Gaylussacia baccata*), Lowbush Blueberry (*Vaccinium angustifolium*), Black Chokeberry (*Aronia melanocarpa*), Running Shadbush (*Amelanchier stolonifera*), Northern Bayberry (*Morella [Myrica] pennsylvanica*), Catbrier (*Smilax rotundifolia*), and Poison Ivy (*Toxicodendron radicans*) with scattered taller shrubs or small trees, especially Eastern Red Cedar (*Juniperus virginiana*), Thicket and Smooth Shadbushes (*Amelanchier canadensis* and *laevis*, Black Cherry (*Prunus serotina*) and oaks (*Quercus*), spp.

The largest examples of this community are of singular importance to a group of birds known as "shrub-scrub species" which depend on this habitat for nesting, namely: Brown Thrasher, Prairie Warbler (now possibly extinct on the "island") Eastern Towhee, and Field Sparrow. It also provides dense cover and food important at all seasons for resident, migratory and wintering birds. The local butterfly species, Brown Elfin, the caterpillar of which feeds on ericaceous shrubs, occurs in this community.

Ridgetop Pitch Pine-Scrub Oak Community. A fire-dependant plant community of only marginal occurrence in Gloucester at present, possibly due to fire suppression. It intergrades with the Acid Rocky Summit and Maritime Shrubland Communities, but there are a few small, discrete stands of ridgetop Pitch Pine in West Gloucester and Dogtown where there is exposed granite or very thin acidic soil. Oaks, ericaceous shrubs, hardy forbs and grasses and species of lichens are also likely to occur. This community has been little studied in Gloucester, so little is known about other species that may be attracted to it. It is of some interest that one area of West Gloucester that burned around 1989 is succeeding to Pitch Pine Barrens and is the only known locality here at present for the Whip-poor-will, an increasingly rare nocturnal bird species once more widespread in Gloucester.

D.4. Maritime Communities

Maritime Rock Cliff Community. This very sparsely vegetated community occurs between the Maritime Shrubland Community and the intertidal zone along the extensive area of rocky shore that armors most of Gloucester's coast. Characteristic plants species include species of

glasswort (*Salicornia*, spp.), Common Rush (*Juncus effusus*), Seaside Plantain (*Plantago maritima*), Poison Ivy (*Toxicodendron radicans*) and the rare Knotted Pearlwort (*Sagina nodosa*, ssp. *nodosa*). The community intergrades with the preceding one.

Maritime Beach Strand Community. Another sparsely, but distinctively vegetated community that lies between the high tide wrack line and the foot of the dunes along sand beaches. Characteristic native species include: Dune Grass (*Ammophila breviligulata*), Sea Rocket (*Cakile edentula*), Beach Pea (*Lathyrus japonicus*), Seabeach Orache (*Atriplex pentandra*), Seabeach Sandwort (*Honckenya peploides*), Seabeach Saltwort (*Salsola kali*) and Seaside Goldenrod (*Solidago sempervirens*). In Gloucester this community also contains several rare plant species, namely: Sea Lyme-Grass (*Leymus mollis* ssp. *mollis*) (State Endangered), Shore Sedge (*Carex lenticularis*) (State Threatened), Seabeach Dock (*Rumex pallidus*) (State Threatened), and American Seablite (*Suaeda calceoliformis*) (State Special Concern).

This community also defines the nesting habitat for two rare birds, the Federally Threatened Piping Plover and Least Tern (State Special Concern), both of which have nested in Gloucester in recent years (Least and Common Terns at the east end of Cranes only) This part of the beach is also an important roosting and feeding area for many species of migratory shorebirds (sandpipers and plovers).

Little of this habitat in Gloucester is protected in any meaningful way and all is subject to moderate to heavy disturbance by beach goers and dogs as well as wild predators such as raccoons, foxes and skunks.

Maritime Dune Community. Dune fields typically rise immediately behind the beach strand area (See preceding account) and often form a barrier between the sea and a salt marsh (See below). They lie within the salt spray zone with very well-drained (sandy) soils and a very distinctive, sparsely distributed plant community. In Gloucester the community's most characteristic plant species include: Pitch Pine (sparse), Northern Bayberry (*Morella* [*Myrica*] *pennsylvanica*), Beach Plum (*Prunus maritima*), Poison Ivy (*Toxicodendron radicans*), Beach Grass (*Ammophila breviligulata*), Beach Pea (*Lathyrus japonica*), Beach Heather (*Hudsonia tomentosa*), pinweeds (*Lechea*, spp.), Sand Jointweed (*Polygonella articulata*), and Seaside Goldenrod (*Solidago sempervirens*). Though not native and at times invasive Saltspray Rose (*Rosa rugosa*) and Beach Wormwood (*Artemisia stelleriana*) are also common in local dunes. Secondary dunes, inland from the primary dunes, typically contain additional plants typical of the Maritime Shrubland Community. In the secondary dunes of Coffin's and Wingersheek beaches, the vegetation conforms closely to Swain and Kearsley's Sandplain Heathland Community, though they lack certain characteristic plants and the many rare species typical of this community on Cape Cod and the Islands. For wetlands within dune systems, see Coastal Interdunal Marsh/Swale, below).

D.5. Urban Forest and Gardens

Gloucester has been recognized as Tree City USA by the National Arbor Day Foundation for the past 17 years. The yearly award by the National Arbor Day Foundation is presented

to towns and cities that display commitment to community forestry. Saluted communities are presented with Tree City USA signs which they can mount near town and city entrances.

A crew of nine Public Works employees maintain thousands of trees lining 26 miles of city roads. The crew does everything from cleaning up damaged limbs and removing downed trees to planting seedling. The City has a tree warden who oversees the care of public street trees.

The City also has an official Garden and Planting Committee that helps coordinate volunteer efforts to maintain planting beds, traffic islands, memorials and median strips through out the City. Volunteers are active in all five wards of the City helping maintain nearly 70 locations (See Appendix A).

Gloucester has two active community gardens located at Riverdale Park and Youngs Farm in Lanesville. A community garden enclosure exists at the Magnolia Woods recreational field has never been actively used, possibly due to its location away from the more densely populated areas of Gloucester.

D.4. Agricultural Land

Gloucester has no extensive commercial farms at this time. Three parcels totaling 57 acres are used as nurseries. Marshall's Farm Stand on Concord Street does a limited amount of commercial vegetable gardening.

D.5. Wetland Resources/Habitat

Wetlands have an important role in both the man-made and natural environments. The relationship of these areas to the water cycle and other processes may affect the natural system in a way which benefits both man and nature. These benefits or values include: (1) flood moderation; (2) wildlife habitat and productivity; (3) visual-cultural values; (4) maintenance of water quality; (5) groundwater influences; and (6) providing open space and recreation for various public uses such as nature study, canoeing, photography and other forms of passive recreation.

Gloucester is fortunate to have a great diversity of wetland types. From large expanses of forested floodplain, miles of shrub-lined inland wetlands border streams, miles of intertidal riverine wetlands, vast sweeps of salt marsh and two large dune eco-systems serve as a barrier to two coastal shrub swamps. Diversity of wetland types and variations within individual wetland areas may result in the occurrence of one, many, or none of these values. The actual wetland function and value depends upon location, topography, subsurface geology, hydrology, vegetative types and use. A direct or indirect loss or alteration of certain wetland areas may subsequently result in the loss or reduction of one or many of these benefits and values. Wetlands, especially marshes and other wetland areas associated with Gloucester's varied coastline, are an important visual resource, adding a rich dimension to the beauty of Gloucester.

Salt Marshes

The largest salt marsh systems in Gloucester lie in Essex Bay and along the Annisquam River and along the Jones River, a tributary from West Gloucester to the Annisquam River. A smaller area lies behind Good Harbor Beach, and a few other small areas are found along Farm Creek, Walker Creek, Little River and Dolliver Beach. These marshes, primarily vegetated with *Spartina Alterniflora* and *Spartina Patens*, are valued for their high biological productivity. It is upon these fragile resources that the food chain of marine life begins. Much of the fish caught in deep waters is linked to these marshes. Cod, pollock, haddock and striped bass are all found in Annisquam River Marshes. Salt marshes are also rich in birdlife, it is common to see blue herons and snowy egrets wading in Gloucester's many salt marshes. Raptors can also be seen scanning the salt marshes for small mammals such as meadow voles.

Dunes

Crowds flock to Gloucester's two busiest public beaches, Wingersheek and Good Harbor to enjoy wonderful stretches of sandy shore line. Behind these beaches lie extensive and fragile dune systems. These dunes are vegetated by a mixture of American beach grass, dune grass, *Hudsonia*, beach pea and other plants of the open dunes. Unfortunately, only a fraction of Gloucester's dunes are permanently protected. Many beach goers are unaware of the fragility and importance of the dune vegetation. Education and enforcement against those who destroy dune vegetation needs to be continual.

North of Wingersheek Beach lies Coffin's Beach a long, sandy beach owned by private individuals. Beach cottages sit nestled along beach protected from waves by the dunes and the fragile dune vegetation that helps hold and perpetuate them. The cottages guests bring foot and illegal ATV traffic that can damage the dunes. Cottage owners often seek permits for decks, septic upgrades and remodeling that require careful review by the Conservation Commission to ensure the dune systems are protected.

Only three sand beaches remain either undeveloped or lightly developed. These include part of Coffin's Beach, Brace Cove, and Lighthouse Cove, where the private Eastern Point Beach Association is maintained.

Good Harbor, Wingersheek, Coffin's and Brace Cove Beaches are all designated as barrier beaches. A barrier beach is a narrow low lying strip of land generally consisting of coastal beaches and coastal dunes which extend nearly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish, or saline water or a marsh system and may be joined to the mainland at one or both ends.

Wingersheek, Good Harbor and Brace Cove beaches are designated as undeveloped coastal barrier beaches according to the Department of the Interior and are subject to the Coastal Barrier Resources Act. Other barrier beaches within Gloucester include Coffin's beach, Old House Cove, a section of Crane's beach, a section of Long beach and sections of beach south of Twopenney Loaf.

Vegetation as habitat

Gloucester is fortunate to have a number of areas within its boundaries which provide habitat for rare species of flora, provide habitat or serve as migratory or resting areas for various types of animal life, or contain a number of specific landform types or locations which are unique in their own right.

There are a number of historically rare and locally uncommon plant species and one reptile species which can be found in Gloucester. Among these are several critically endangered species such as sea lyme grass, heartleaf twayblade, and sweetbay magnolia. Plants that are deemed threatened within Massachusetts include arethusa, seabeach dock and knotted pearlwort. In addition the spotted turtle, which is considered a special concern, has established a habitat in Gloucester.

Eastern Point has been known to serve as a resting and gathering area for Monarch butterflies prior to their southern migration. Some of Gloucester's marshes and waters also serve as resting grounds for various types of migratory water fowl and wintering water birds.

ACEC

The Salt Marshes and dune system, bordering on Essex Bay and to the west of Wingaersheek Rd and Coffins Beach is part of the Parker River/Essex Bay or Great Marsh Area of Critical Environmental Concern (ACEC). The salt marsh grasslands, tidal creeks, and estuaries of this Great Marsh make up one of the richest habitats on earth. Its 25,000 acres stretches from Gloucester to Newburyport and is the largest salt marsh in New England, contains an astonishing diversity of plants and animals. Its marshes and clam flats are among the most pristine in the state. The ACEC is a flyover for migrating birds.

Eel Grass

Although eel grass beds in Gloucester, like the rest of coastal Massachusetts, have historically declined, conservation and replanting have hopefully reversed that trend. Eel grass beds are currently growing off-shore near Stage Fort Park, the Blynman Canal, along the coast of Eastern Point, along the shores of Annisquam, Hodgkins Cove, and Plum Cove

Eelgrass is a productive near shore marine habitat that supports diverse floral and faunal species, absorbs nutrients, stabilizes sediments, and provides habitat and detrital biomass for to a diversity of life. Eelgrass is home to both economically important species, such as American lobster and winter flounder, and relatively unknown creatures—chink snails, skeleton shrimp, and lumpfish.

Vernal Pools

In addition to Gloucester's many fragile coastal habitats, the City has 51 vernal pools that have been certified with the Natural Heritage and Endangered Species Program and many yet to be certified. Many of these confined basin depressions exist in isolated perched wetlands

or along the forested floodplain floor. Many of these vernal pools are in Dogtown and Ravenswood, two large undeveloped areas of Gloucester.

These ephemeral springtime bodies of water serve as important breeding grounds for wood frogs, and several species of mole salamanders. Often situated in a shrub swamp, these pools are surrounded by buttonbush, high bush blueberry, sweet pepper bush and swamp azalea. The amphibian's egg masses are frequently attached to the low lying shrubs and fallen tree branches.

Invasive Species

Japanese knotweed, non-native Phragmites, Pepperweed, Oriental Bittersweet and Norway Maple trees are all invasives that have a strong foothold throughout the developed areas of Gloucester. In addition, The Conservation Commission has been working with property owners to develop eradication plans that are incorporated in to Orders of Conditions and monitored for the subsequent three years.

D.6. Rare and Unique Species

Gloucester is fortunate to have a number of areas that provide habitat for rare species of flora, migratory or resting areas for various types of animal species and there are a number of specific landform types or locations that are unique in their own right. There are a number of historically rare and locally uncommon plant species which can be found in Gloucester. Among these are several critically endangered species such as sea lyme grass, heartleaf twayblade and sweetbay magnolia. Plants that are deemed threatened in Massachusetts include arethusa, seabeach dock and knotted pearlwort. Eastern Point is known to serve as a resting and gathering area for Monarch butterflies prior to their southern migration. Some of Gloucester's marshes and waters also serve as resting grounds for various types of migratory water fowl and wintering water birds. Table 4-1 provides an inventory of historically rare and locally uncommon plant species can be found in Gloucester.

Table 4-1: INVENTORY OF ENDANGERED (E), THREATENED (T) AND SPECIAL CONCERN (SC) PLANT SPECIES FROM THE MASSACHUSETTS NATURAL HERITAGE PROGRAM

Community	Type of Species	Scientific Name	Common Name	Status	Date Listed
GLOUCESTER	Vascular Plant	Carex lenticularis	Shore Sedge	T	1917
GLOUCESTER	Vascular Plant	Goodyera repens	Dwarf Rattlesnake-plantain	E	1966
GLOUCESTER	Vascular Plant	Leymus mollis ssp. mollis	Sea Lyme-grass	E	2007
GLOUCESTER	Vascular Plant	Liatrix scariosa var. novae-angliae	New England Blazing Star	SC	1928
GLOUCESTER	Vascular Plant	Listera cordata	Heartleaf Twayblade	E	1905
GLOUCESTER	Vascular Plant	Magnolia virginiana	Sweetbay Magnolia	E	2003
GLOUCESTER	Vascular Plant	Malaxis bayardii	Bayard's Green Adder's-mouth	E	1877
GLOUCESTER	Vascular Plant	Ophioglossum pusillum	Adder's-tongue Fern	T	1880
GLOUCESTER	Vascular Plant	Rumex pallidus	Seabeach Dock	T	1993
GLOUCESTER	Vascular Plant	Suaeda calceoliformis	American Seablite	SC	1982
GLOUCESTER	Vascular Plant	Vaccinium vitis-idaea ssp. minus	Mountain Cranberry	E	1988

D.7. Unique Resources

The quarries of North Gloucester represent a unique resource for Gloucester residents. Vernon's Quarry and most of Nelson's Quarry are located within the City-owned Plum Cove Recreation Area. Additional quarries are scattered through out the North Gloucester Woods area on privately-owned parcels.

The deep granite pits of the quarries capture rain water and snow melt. The fresh cool waters of the quarries attract swimmers looking to refresh themselves on hot summer days and evenings.

Management of Vernon's and Nelson's Quarries has proven problematic over the years. Quarry visitors from outside the Lanesville area had parked along the narrow roads leading to the quarries from Plum Cove School and granite. The City has now implemented parking bans along those streets to discourage use of the quarries. Residents abutting the quarries have complained about the trash left by visitors.

D.8. Vegetation Mapping Projects

The City does not have any new vegetation mapping projects underway and relies primarily on the wetlands mapping project to identify parcels that require additional scrutiny. The City has formed a water supply committee that will look at watershed management.

The North Gloucester Woods existing conditions study will seek to identify unique habitats in that study area. That success of that study will determine whether additional studies of the Magnolia Woods and West Gloucester will be undertaken in the future.

E. FISHERIES AND WILDLIFE

Fishing and to a much lesser extent hunting are popular activities in Gloucester. The Cape Ann Sportsman Club owns nearly 30 acres of land in Gloucester for the purposes of target practice, hunting, and angling. The Massachusetts Division of Fisheries and Wildlife has stocked some of Gloucester's freshwater streams with trout in the past. Saltwater fishing for sport is also a popular activity among residents and tourists.

Gloucester's animal population is not limited to small mammals and urban wildlife such as gray squirrels, common skunks and mice. Moles, raccoons, muskrat, fox, shrews, chipmunks, rabbits and various types of songbirds. Deer, coyotes and fishers can also be found in Gloucester. Gloucester also features one rare and locally uncommon reptile, the Blanding's Turtle. Several species of pinniped seals may also be seen in coastal areas and occasionally on the shore.

Water birds and waterfowl found in Gloucester area include Common Loons, Horned Grebes, Common Eiders, Harlequin Ducks, Great Cormorants, Common Goldeneyes, Semipalmated Sandpipers, herring Gulls, Snowy Egrets, Belted Kingfishers and Great Blue Herons. Many of these water birds feed on insects, fish and other forms of marine life which exist in salt and freshwater marshes, coastal waters and beaches. Residents and tourists enjoy bird-watching through-out Cape Ann and Essex Bay.

All wildlife have three basic requirements of food, cover and water which are necessary for survival. Fish, amphibians and water fowl require the presence of water for spawning and egg laying. Vegetation provides the necessary cover to serve as nursery habitat. Water also serves as spawning grounds for insects, which, in addition to vegetation, provides food for various animals. Furbearers such as muskrat and beaver often utilize wetlands to fulfill all of their basic needs of survival. Coastal and inland marshes serve not only as breeding grounds for waterfowl but also are critical resting and feeding areas during spring and fall migration.

The value of an area as habitat depends on a number of factors including size, contiguity with similar areas and amount of edge. Edge is the transitional area between habitat types which consists of understory plants and early successional types of vegetation which provide both forage and cover for numerous species of birds and mammals, Edge can be created by utility transmission rights-of-ways, crop and pasture land practices, habitat value and edge effect on an area may be significantly reduced if adjacent land uses and encroachments by man create barriers or threaten the integrity of that area.

Table 4-2: INVENTORY OF ENDANGERED (E), THREATENED (T) AND SPECIAL CONCERN (SC) SPECIES (FAUNA) FROM THE MASSACHUSETTS NATURAL HERITAGE PROGRAM

Community	Type of Species	Scientific Name	Common Name	Status	Date Listed
GLOUCESTER	Amphibian	Ambystoma laterale	Blue-spotted Salamander	SC	1997
GLOUCESTER	Beetle	Cicindela rufiventris hentzii	Hentz's Redbelly Tiger Beetle	T	Historic
GLOUCESTER	Bird	Charadrius melodus	Piping Plover	T	2002
GLOUCESTER	Bird	Sterna hirundo	Common Tern	SC	2007
GLOUCESTER	Bird	Sternula antillarum	Least Tern	SC	2007
GLOUCESTER	Dragonfly/Damselfly	Enallagma pictum	Scarlet Bluet	T	1972
GLOUCESTER	Reptile	Emydoidea blandingii	Blanding's Turtle	T	1992

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

F.1. Beaches and Dunes

Good Harbor and Wingaersheek beaches are truly regional resources: beaches of unusual quality fully developed with parking, sanitary facilities, changing rooms and refreshment stands. Stage Fort Park's Half Moon and Cressy beaches are similarly developed and lie on the western side of Gloucester Harbor. Niles, Pavilion, and Plum Cove beaches are intended to serve a more local population, so offer only parking, but not sanitary or changing facilities. There are port-o-potties at these smaller beaches.

At Coffin's Beach, a long length of sand beach has been privately pre-empted. Only three sand beaches remain either undeveloped or lightly developed. These include part of Coffin's Beach, Brace Cove and Lighthouse Cove, where the private Eastern Point Beach Association is maintained.

Good Harbor, Wingaersheek, Coffin's and Brace Cove beaches are all designated as barrier beaches and are subject to the Coastal Barrier Resources Act. A barrier beach is a narrow low lying strip of land generally consisting of coastal beaches and coastal dunes which extend nearly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh, brackish, or saline water or a marsh system and may be joined to the mainland at one or both ends.



Good Harbor Beach
 (Good Morning Gloucester Photo)

F.2. Public Landings

Gloucester has 58 historic public landings overseen by its Waterway Board. Twenty-five landings and four sandy beaches provide ready access to the water for the public. See Attached Inventory List (Appendix B) for the current status of these landings. Given the importance of on-water recreation, commercial and recreational fishing and Gloucester's maritime traditions, maintenance of these access points is vital. The City of Gloucester also permits 1100 public moorings along its coast line through the Harbor Master's Office.

F.3. Unique Landscapes and Geological Features

Geologic features that abound in Gloucester include Cape Ann granite, hornblended granite, glacial erratics, glacial outwash, and moraine. Gloucester's unique landscapes have been an inspiration to all that have come to live and visit. Numerous landscape painters including Gloucester-born Fitz Henry Lane, Winslow Homer and Edward Hopper have painted scenes of Gloucester. More recently, during the development of Plan 2001 a photo essay contest helped identify 300 special places in Gloucester. (See Figure 17 and Appendix C). Some of the most unique landscapes include:

Mount Ann Area: Gloucester's highest point. Once an iconic entry point to Gloucester that included a tower with 360 degree views. Today's visitors pass a sweeping view of the Little River inlet at Stoney Cove on the approach to the A. Piatt Andrew Bridge over the Annisquam River.

West Gloucester Woods: Mount Ann, Red Rocks, Eagle Rock and the Tompson Street Reservation offer opportunities to hike through deep woods and access scenic vistas of the Harbor, Ipswich Bay, the Great Marsh and, on clear days, out 25 miles to the Isle of Shoals.

North Gloucester Woods: The protected and unprotected north woods of Dogtown offer 3000 acres that in the southern portion provide extensive watershed lands that are criss-crossed by historic footpaths accessed from the densely-settled northern villages of Gloucester.

Annisquam River: A unique tidal river that separates the island section of Cape Ann from the main land, the Annisquam has extensive salt marshes punctuated on its northern entrance to Ipswich Bay by the Annisquam Light House and at its southern entrance to Gloucester Harbor by the Blyman Canal and the "Cut Bridge". The river can also be viewed from Poles Hill and numerous landings such as Dunfugin' and Long Wharf.

Coastal Approaches: Numerous scenic vistas along the coast include Magnolia, Rafe's Chasm, the Ledge Hill Trail in Ravenswood Park and numerous landscapes. Stage Fort Park offers views of Gloucester Harbor and unique monuments to the founders of Gloucester.

Gloucester Harbor: Many unique views of the inner harbor including the Fisherman at the Wheel Memorial along Stacey Boulevard, views of Ten Pound Island and Lighthouse, view from the Harborwalk to the active fishing port. Framed to the east by Rocky Neck, the Eastern Point breakwater, lighthouse and wildlife sanctuary. These can be viewed from Governor's Park and Fisherman Memorial Park located in the neighborhood hills above Downtown Gloucester.

Bass Rocks: Rocky granite shore drive with view of the Twin Lighthouses located on Thatcher's Island. Also in East Gloucester is Seine Field owned by the Essex Greenbelt which is used to this day by fisherman to spread their "seine nets" to dry in the sun.

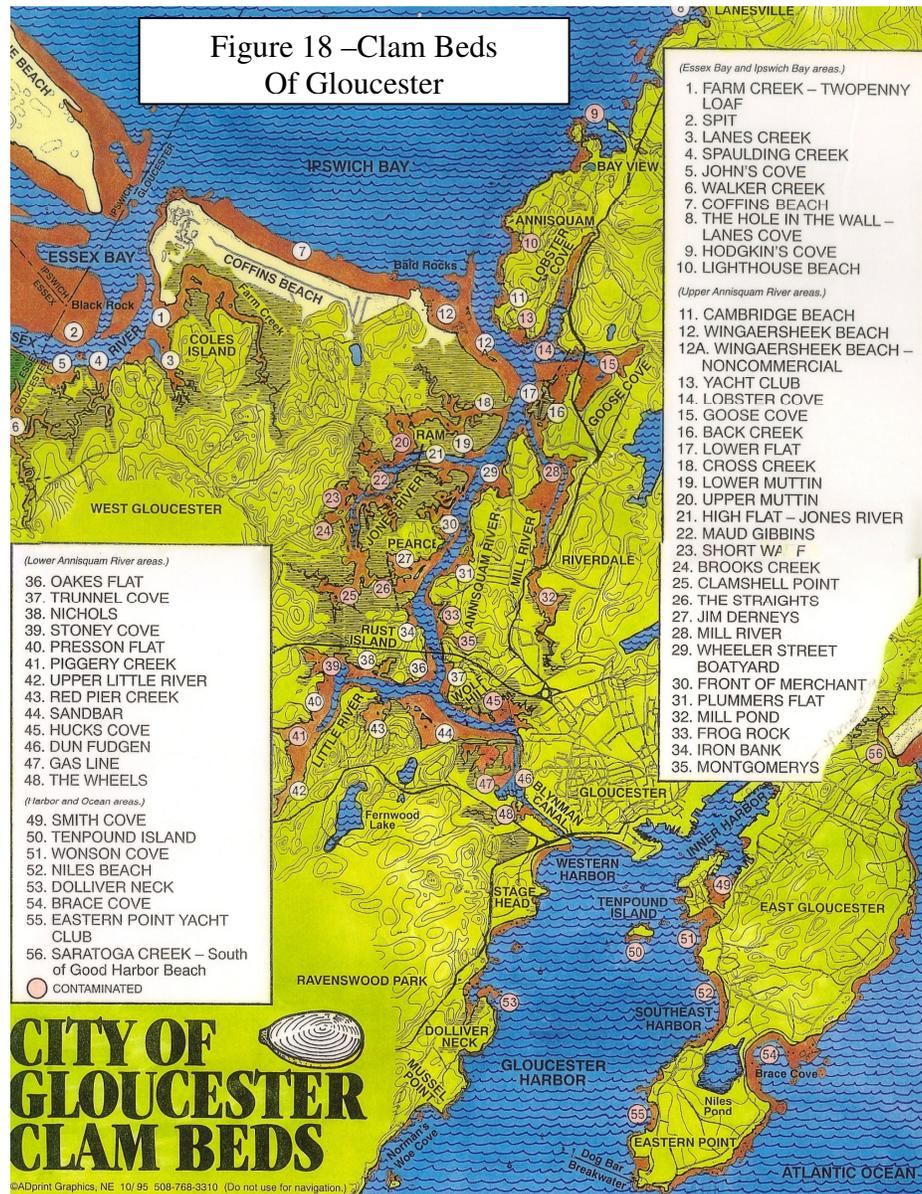
Good Harbor Beach: Offers view of rolling Atlantic Ocean waves crashing onto a sandy barrier beach and a scenic footbridge and salt marsh.

F.4. Shellfish Beds (Figure 18)

The portion of Gloucester along Essex Bay known as The Great Marsh Area has been designated as an Area of Critical Environmental Concern by the Massachusetts Executive Office of Energy and Environmental Affairs. Its marshes and clam flats are among the most pristine in the state. The ACEC serves as a stopover for migrating birds and a nursery for nesting birds.

The City of Gloucester has 64 miles of coastline (almost all of which is viable shellfish habitat) and 35 different shellfish growing areas that are grouped into seven general shellfish growing areas. The City issued 103 commercial and 300 recreational permits for shell fish harvesting in 2009.

The principal shellfish resources within the City of Gloucester are soft shell (steamer) clams *mya areanaria*, razor clams, *ensis directus*, blue mussel *mytilus edulus*, surf (or sea) clams *spisula soldissima*, ocean quahog *artica islandica*, quahog, *mercenaria mercenaria*, american oyster *crassostrea virginica*, and european oyster *ostrea edulis*.



F5. Cultural and Historic Areas

Site of significant historic and cultural interest include:

- Gloucester Fishermen's and Fishermen's Wives Memorials: Gloucester's most noted landmark is the harborside "Man at the Wheel" statue (also known as the "Gloucester Fisherman's Memorial Cenotaph"), dedicated to "They that go down to the sea in ships". The memorial sits along Stacy Boulevard overlooking Gloucester Harbor. Nearby the Fishermen's Wives Statute honors the wives and children left ashore.
 
- Historic Homes and Museums:
 - Beauport, Sleeper-McCann House: Containing unique collections from the colonial era, the house is the work of designer Henry Davis Sleeper and is arranged by color and light.
 - Cape Ann Museum: The museum exhibits the largest collection of paintings and drawings by Fitz Henry Lane, the Gloucester native is recognized as one of America's most important 19th Century artists.
 - Hammond Castle: John Hays Hammond, Jr. built his medieval-style castle between the years 1926 and 1929 to serve both as his home and as a backdrop for his collection of Roman, medieval, and Renaissance artifacts. In addition, the building housed the Hammond Research Corporation, from which Dr. Hammond produced over 400 patents and the ideas for over 800 inventions.
- Gloucester Waterfront and Harbor including
 - Gloucester Maritime Heritage Center: Occupying nearly 2 acres overlooking Gloucester Harbor, the center features the oldest continuously operating marine railway in the country.
 - Cape Pond Ice Company: Cape Pond Ice is located on the working waterfront. Tour this historic ice house and learn more about the 160 year old history of the company.
 - Historic buildings include the Fitz Hugh Lane House on Rogers Street near the Harbor Loop and the Paint Factory.
 - Rocky Neck Artist Colony: home of the first Art Colony in the country; some of the colony remains, with art studios and galleries open in the summer, attracting residents and tourists.

- Downtown Historic District:
 - Sargent House Museum: Once the home of sea merchants, American patriots and religious and community leaders, the home is a fine example of Georgian architecture built in 1782.
 - City Hall: Built in 1870 in the style of Independence Hall in Philadelphia a City Hall Preservation Committee has been formed to support the preservation of this historic public building.
- Historic Fishing and Quarrying Villages:
 - Annisquam: Established as a fishing village in 1631, the name is said to derive from Ann (as in Cape Ann) and squam, meaning harbor. In the late 19th-century, it was home to both granite quarrying and an artist colony, At the mouth of the Annisquam River on Ipswich Bay is Annisquam Harbor Light, perhaps the village's most historic edifice. The lighthouse has been in the same spot since 1801, having undergone significant repairs in 1850. (Source American Public University)
 - Plum Cove: One of many small fishing villages where fish houses, wharves and drying racks were built
 - Lanesville: This village served as the location where quarried granite blocks were hauled by oxen to nearby Lane's Cove where they were loaded onto sailing vessels for delivery by water to major cities in the Northeast.
- Magnolia: Originally known as Kettle Cove, the village name of Magnolia came into use during the 1870's as newly built inns began to cater to summer tourists. Magnolia refers to the native Magnolia trees now mainly found in nearby in Ravenswood Park.

A full list of "Special Places" in Gloucester was compiled as part of Plan 2001 and is provided in Appendix C.

G. ENVIRONMENTAL CHALLENGES

Gloucester faces a variety of environmental challenges including flooding, coastal and stream degradation, brownfield restoration, forest fires, groundwater and surface water pollution.

G.1. Flood Hazards (from the Gloucester Hazard Mitigation Plan 5-27-2010 Draft)

Flooding was the most prevalent serious natural hazard identified by city community development and department of public works department staff during preparation of the City's Hazard Mitigation Plan. Flooding is caused by hurricanes, nor'easters, severe rainstorms and thunderstorms. Gloucester is 26.66 square miles or 17,062 acres. Approximately 1,783 acres (10%) have been identified by city staff as areas of flooding.

Areas within the city that are subjected to storm action and flooding include the Atlantic Ocean along the coastline, the Mill River from the Babson Reservoir to the Mill Pond Bridge, and several low-lying areas adjacent to the Annisquam River. The coastal areas are subject to periodic flooding and wave surge that accompany coastal storms.

There have been a number of major storms that have resulted in significant flooding in northeastern Massachusetts over the last fifty years. Significant storms that triggered federal disaster declarations include:

1. August 1954
2. March 1968
3. January 1969
4. February 1978
5. April 1987
6. October 1991 ("The Perfect Storm")
7. October 1996
8. June 1998
9. March 2001
10. April 2004
11. May 2006
12. April 2007
13. January 2009
14. March 2010

The City of Gloucester participates in the National Flood Insurance Program enabling property owners to purchase insurance protection. A community must implement and enforce measures to reduce future flood risks to new construction in special flood hazard areas. The City's Draft Hazard Mitigation Plan being prepared by the MAPC identifies more specific mitigation measures for flood-prone areas of the City.

Section 5.5 of the zoning ordinance prohibits the issuance of building permits for principal buildings on land less than 10 feet elevation above U.S.G.S datum except on approval of a Special Permit for an exception by the City Council.

G.2. Sedimentation/Erosion

Sedimentation and erosion frequently occurs at the interface of stormwater structures and coastal resource areas including:

- Good Harbor Beach is a barrier beach which has experienced periodic erosion over the years. The barrier beach is flanked to the north and south by residential neighborhoods set on rocky headlands. A couple of homes have made repetitive damage claims due to damage from intense coastal storms.
- Coffins Beach is a barrier beach, part of which falls within the Great March ACEC. This area has had periodic losses of dunes due to wave and wind action although the long-term trend indicates that accretion is occurring;
- Mill River: The Mill River is silted in with 2 feet of silt. One potential mitigation measure would be to undertake stream restoration of Alewife Brook to Mill Pond.
- Newall Stadium: This football stadium sits below sea level on a filled salt marsh. There is a sea wall but the stadium still floods. The sea wall impacts a navigable channel, the Blynham Canal.
- The Boulevard was built on unconsolidated material and is subject to being washed out by wave action. here is no long term management plan for this area. The City needs to maintain the sea walls.
- Cedarwood/Fenley: Historical development of this neighborhood resulted in the loss of wetlands and floodplains. The flooding could be mitigated by floodplain restoration and improved maintenance of the culverts.
- Back Shore Inland – This area floods because of historic filled wetlands. One possible mitigation measure would be to construct wetlands to replace those that were lost.

G.2. Stream Habitat Degradation and Restoration (excerpted from the Stream Habitat Restoration Report , MA Audubon 2003)

In 2003 the Massachusetts Audubon Society developed an inventory of degraded river and stream habitats and anadromous fish runs in Gloucester, and a report to restore and promote the protection of healthy river systems through restoration, stewardship, and education.

This restoration report was a first step towards achieving one of the goals of the City of Gloucester's Community Development Plan 2001. The Community Development Plan states:

"Protect the environmental resources of Gloucester through regulation, vigilance, and actions that preserve water supply and water quality and conserve rare and sensitive natural environments and habitats." Two of the objectives to fulfill this goal include "make wetlands, anadromous fish, and shellfish bed restoration and protection priorities for action" and "inventory all rivers and streams and wetlands and establish restoration programs" (City of Gloucester, 2001).

Audubon's inventory and prioritization of sites provides a starting point for the city and stewardship groups to address the degradation of Gloucester's rivers and streams. Many of

the sites identified in this restoration report will need further study, especially if the maximum ecological benefit is to be obtained. A hydrologic study, for example, is an essential component of any project that proposes to alter flow, as the repercussions of a poorly planned and executed restoration may be devastating.

Results from the prioritization process have revealed that some potential restoration sites can be considered independently, without addressing upstream or downstream disturbances. Others must be done in conjunction with several projects in the same watershed or the full positive effect of the restoration will not be realized. Addressing multiple sites at the same time or in phases is usually the best way to restore anadromous and catadromous fish runs.

Figure 19 – Stream Restoration Quadrants

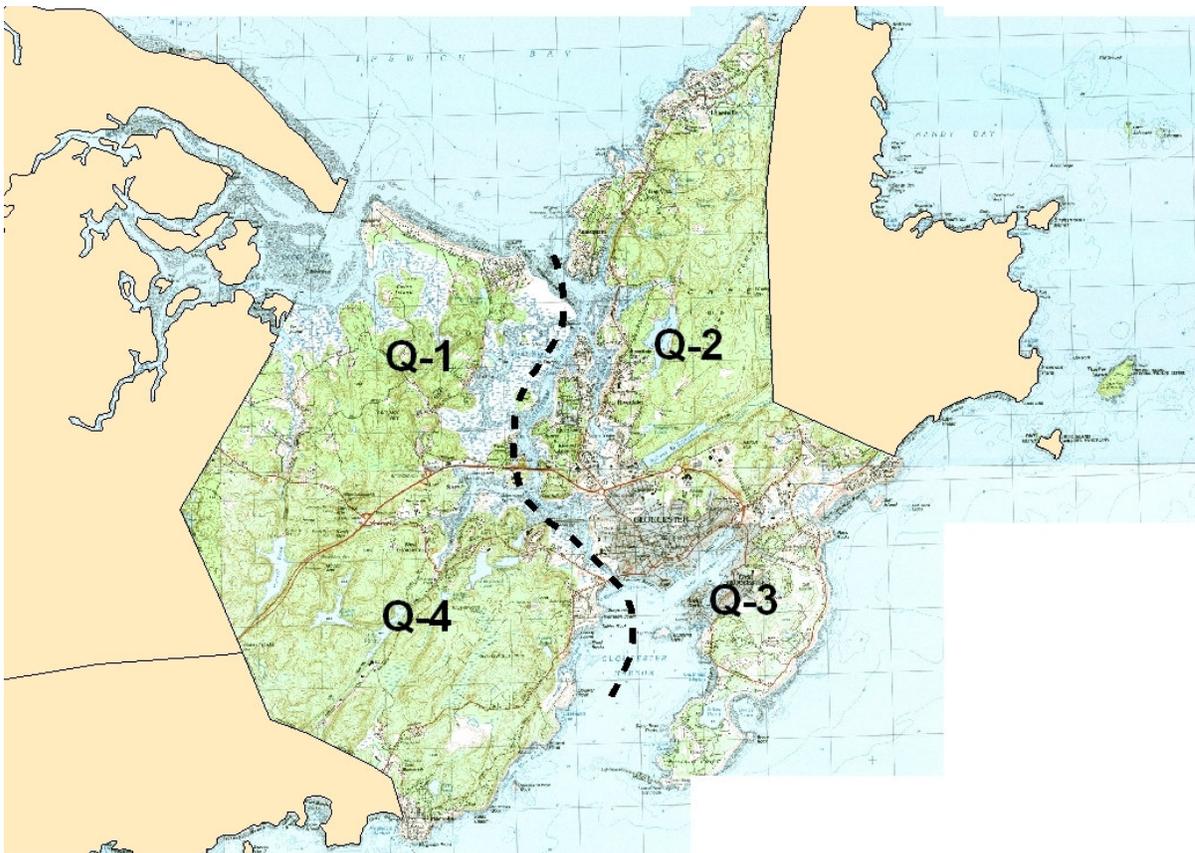


Table 4-3: Priority Stream Restoration Projects

Quad	Site#	Watershed Location	Score	%	Normalized Score
Q-1	61	Unnamed	175	76	100%
Q-1	45	Jones/AnnisquamRiver	170	74	97%
Q-1	7	WalkerCreek	165	72	94%
Q-2	48	MillRiver	165	72	94%
Q-1	36	SleepyHollowPond	160	70	91%
Q-1	65	WalkerCreek	155	67	88%
Q-3	26	Day'sPond	155	67	88%
Q-4	23	LittleRiver	155	67	88%
Q-4	24	LittleRiver	155	67	88%
Q-4	29	FernwoodLake	155	67	88%
Q-4	37	BlynmanCanal	155	67	88%
Q-2	46	MillRiver	150	65	85%
Q-1	64	AnnisquamRiver	145	63	82%
Q-2	43	MillRiver	140	61	80%
Q-3	3	BlynmanCanal	140	61	80%
Q-3	20	GoodHarborBeach	140	61	80%
Q-2	42	MillRiver	135	59	77%
Q-2	64	AlewifeBrook	135	59	77%
Q-3	14	SaratogaCreek	135	59	77%
Q-3	11	BlynmanCanal	130	57	74%
Q-2	59	AnnisquamRiver	125	54	71%
Q-3	6	EmeraldForest	125	54	71%
Q-3	46	Day'sPond	125	54	71%
Q-4	14	Norman'sWoeCreek	125	54	71%
Q-4	15	Norman'sWoeCreek	125	54	71%
Q-1	20	WalkerCreek	120	52	68%
Q-1	54	Unnamed	120	52	68%
Q-2	44	MillRiver	120	52	68%
Q-2	47	MillRiverTributary	120	52	68%
Q-2	45	MillRiver	115	50	65%
Q-3	43	GoodHarbor	110	48	62%
Q-3	28	SaratogaCreek	105	46	60%

Source: City of Gloucester Comprehensive River and Stream Habitat Restoration Report, MA Audubon Society, 2003

The tide gate at Washington Street along the Mill River has been replaced and the Mill Pond now receive daily tidal flushing. The City has received a grant to improve flow for Little Creek as well.

G.3. Harbor Contamination and Brownfields

Gloucester’s inner harbor has been in active use for over 300 years and has a number of known issues associated with industrial ports including:

1. Contamination of the water column and seafloor from land-based sources (storm water, raw and treated sewage, toxic spills, fish processing, incomplete combustion of fuel, etc.) and vessels (sewage, petroleum and fuel spills).

2. Degraded and lost habitat due to dredging, seafloor scouring from mooring chains and vessel traffic, pollution from vessels and land-based sources, filling of coastal and intertidal habitats, and rising sea levels.

3. Loss of biodiversity due to episodic low concentrations of dissolved oxygen, the introduction of non-indigenous species (via commercial and recreational boating), contaminated sediments and habitat degradation. Sediment samples taken a number of years ago revealed low levels of heavy metals in Gloucester Harbor, typical of older industrial ports. Copper and lead were prevalent in the Federal Channel. Elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) were measured in the north, south, and federal channels and detectable levels of polychlorinated-biphenyls (PCBs) were found throughout the federal channel and in Harbor Cove. Although much of the sediment in the Annisquam River was clean, some areas were characterized by low levels of PAHs, PCBs, copper and lead.

4. A former coal gasification site along Rogers Avenue near land currently owned by National Grid.

Source: Massachusetts Office of Coastal Zone Management (2004) and included in the 2009 Harbor Plan:

Contamination has also been identified on a former marina site along the Annisquam River north of Cape Ann Marina. This area has been proposed for development of a hotel with a waterfront walk.

G.4. Forestry / Fire Related Hazards (Gloucester Hazard Mitigation Plan 5-27-2010 Draft)

Brush fires are a fairly common hazard and tend to be concentrated in four areas: Great Magnolia Swamp, Dogtown, West Gloucester Watershed Land and the West Gloucester Woods. There have been some historically significant fires. In 1947 there was a fire that jumped the river. In 1997 there was a fire that burned for two weeks and shut down Route 128 for a period of time.

Dogtown – Frequent brush fires are often started by teens who start bonfires. The area has a lot of fuel including briar growth. In addition, the area is exposed to wind from all directions. The City used to do controlled burning in this area and the area does need to be managed to reduce the fire risk. What happens in Dogtown impacts water quality in the City.

Great Magnolia Swamp – This is a wooded area in the southwestern portion of the City situated in and near Ravenswood Park. The southern portion of the Great Magnolia Swamp abuts a residential neighborhood with the potential for fires to impact this neighborhood.

G.5. Landfills

Up until 1988, solid waste was brought to the municipal sanitary landfill off Western Avenue in Magnolia³. The capping of the landfill included the construction of the Magnolia Woods recreational facility featuring six soccer fields and one softball field. The City promotes recycling through curbside collection, pay-as-you-throw garbage collection and hazardous waste drop-off days. The City operates a compost facility near Dogtown Commons and is considering adding a facility in Magnolia Woods.

G.6. Groundwater Pollution

Gloucester relies on surface water for its drinking water supply so little attention has been paid to ground water pollution. Also, many areas of Gloucester sit on-top of granite ledge where groundwater is not present.

G.7. Surfacewater Pollution

G.7.a. Public Sewer System

In 2000, 9,400 of Gloucester's 12,600 households were served by its public sewer system. The City has a program to ensure proper connections to its sewer system, minimize leaky pipes in the system, and better track water and sewage conveyance in downtown Gloucester.

Historically, lack of access to sewage disposal infrastructure constrained development in the out-lying residentially zoned areas. In the late 1990s, the City was court-ordered to sewer extensive areas including a northern extension to Riverdale, Bayview, Annisquam, and Lanesville. The City also agreed to a sewer extension to the east along the Essex Avenue corridor through West Gloucester to the Town of Essex. These sewer extensions have radically changed the long-term development potential of several areas of the City. In North Gloucester, sewer extensions resulted in additional development on streets leading into the north Gloucester woods such as High and Quarry Streets and raises potential for further development into the rocky interior, perhaps most importantly, the undeveloped north Gloucester woods that abut Dogtown but have no preservation constraints on the lands. For now, due to funding constraints, several rural areas in West Gloucester remain without sewer.

The sewer extension up Route 133 allowed the residential land adjacent to the road corridor in West Gloucester to be connected in and raises the long-term potential for increased development should trunk lines be connected to more areas. .

In 2006 the City initiated a multi-year "Clean Water for a Better Gloucester" project to improve its existing sewer system concentrated around Downtown Gloucester and the Harbor. New pipes are being installed to keep stormwater separate from the pipes that collect and direct sewage to the City's the wastewater treatment plant. Project Clean Water for a Better Gloucester began in May, 2006 with the highest priority project, the Washington

³ The City now sends its solid waste to the RESCO incinerator in Saugus and has a pay-to-throw program that has increase recycling rates.

Street Drain. The project has nearly been completed as of February 2010. The project and associated improvements were estimated to cost \$12 million.

G.7.b. Private Septic Systems

Gloucester has approximately 3,200 private septic systems. Under the state septic system regulation (known as Title 5), inspections identify problems with these systems along with occasional reports by neighbors or septic system pumpers. Eighty-four failing systems have been identified in the West Gloucester study through these inspections. Failing systems must be upgraded within two years. The City’s Board of Health has staff dedicated to ensuring failed systems are upgraded to current standards.

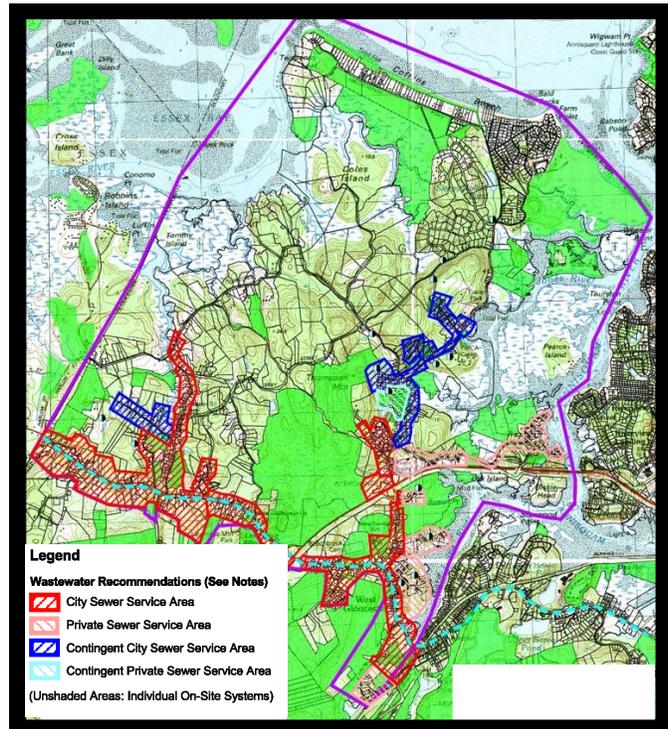
Septic systems exist throughout Gloucester even in water supply areas and in salt marshes. Title 5 ensures the gradual phasing out of antiquated systems in sensitive areas. Many septic systems have been upgraded near Lily Pond, an alternative drinking water supply.

Another factor in development patterns has been the passage of Title V Septic regulations in the early 2000s. These regulations make possible shared sewage systems and create the potential for new subdivisions in the most rural areas of the City.

G.7.c. West Gloucester Wastewater Plan

The City’s current sewer system improvements will not extend the system into outlying portions of West Gloucester that lack sewer lines and rely primarily on private septic systems to handle waste. In 2001 the City hired Daylor Associates to develop a Land Use and Wastewater Plan for West Gloucester in order to assess the potential impact of the sewer extension along Route 133 to the Town of Essex that was eventually built in 2005.

The wastewater plan proposed five wastewater treatment solutions targeted to specific areas in West Gloucester. These solutions proposed new sewer connections for areas that contain a concentration of known or suspected failing systems, contribute significantly to water quality problems, and/or are located adjacent to the proposed sewer main on Essex Avenue.



West Gloucester Sewer Plans

The land use recommendations of the West Gloucester Study focus on targeting new development into appropriate sewerred areas while protecting open space in the rural, unsewered areas.

Walker Creek in West Gloucester leads to shellfish beds and an Area of Critical Environmental Concern. The neighborhood homes surrounding Walker Creek primarily use septic systems, some which have failed.

G.7.d. Septic Issues at Recreation Facilities

Several recreational facilities have bathrooms that have on-site sewage facilities including:

- Wingersheek Beach: sewage stored in a 5000 gallon tight tank that needs to be pumped more than once a day during the summer peak period. A septic system may not be practicable due to high groundwater. Consideration is being given to adding another tight tank.
- Stage Fort: has a septic system with leach pits. The system has regular maintenance. The system works properly due to good soil characteristics and seasonal use.
- O'Maley athletic fields use a tight tank.

G.8. Environmental Equity

Community outreach at the City's Health Fair, with Riverdale Park residents and a review of the distribution of resources and facilities did not present any strong inequities in terms of the number and distribution of facilities. Residents at Riverdale Park indicate that they could access beaches and Dogtown. Children from through-out the City participating in a "Where do you Get Fit?" mapping exercise indicated that the centrally located Stage Fort Park was their favorite park. A review of the number and geographic distribution of playgrounds and fields indicated that all densely-populated neighborhoods had access to these facilities.

Equity issues arise more in the long-term maintenance and rehabilitation of playgrounds and fields. Playground equipment has been replaced in most neighborhoods of the City without consideration of handicap accessibility. The City uses wood chips as the base surface under this equipment. Wood chips must be 12-inches in depth to protect from falls and to allow ADA access. The DPW must frequently refresh these chips.

DPW staff strains to maintain existing parks and often relies on community groups such as sports leagues, PTOs and service organizations such as the Rotary Club to help maintain and upgrade facilities. This stretches scarce City resources and leverages the great volunteer energy in Gloucester. Weaknesses of this approach can be that facilities that serve the neediest groups or non-organized play become run down and areas become a collection of individual improvements that do not create a coherent park experience.