TOWN OF CHARLEMONT
OPEN SPACE
AND RECREATION PLAN
UPDATE 2024

Prepared by the
CHARLEMONT OPEN SPACE AND RECREATION PLAN UPDATE PROJECT TEAM

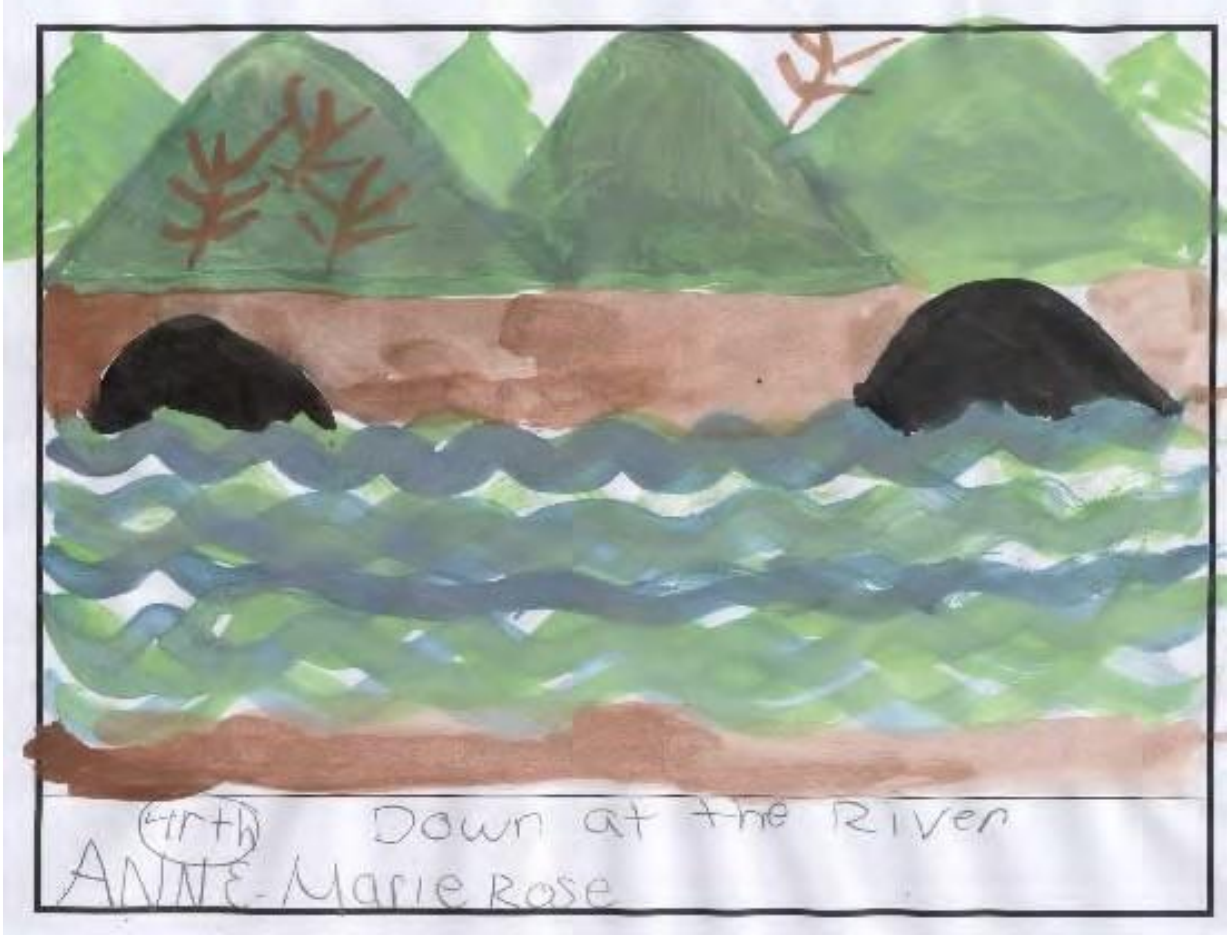


Table of Contents

SECTION 1

PLAN SUMMARY

The 2024 Charlemont Open Space and Recreation Plan is a comprehensive inventory of the town's natural, agricultural, cultural and recreational resources as well as a plan for their stewardship and conservation. It contains an analysis of the town's needs, goals and objectives. The plan is designed to help guide important decisions about the use, conservation and development of the land and resources within Charlemont. A five-year action plan provides real steps that residents are already engaged in implementing towards achieving their common goals. The Plan emphasizes the remarkable wealth of the town's resources, including:

- Prime farmland and fourteen working agricultural businesses;
- The only 10,000-acre block of contiguous forest in West County (shares with Heath and Colrain);
- The Mohawk Trail State Forest;
- BioMap Core Habitats for rare species;
- A rare high yield aquifer under the Deerfield River in the western portion of Charlemont;
- The historic Charlemont Fairgrounds; and,
- The Deerfield River's wildlife habitat, prized scenic views, and recreational and economic benefits.

These resources provide residents with clean air and water, a rural environment within which to live, jobs, and access to an abundance of recreational opportunities. Charlemont's forests and farmland give the town its rural character, contribute to the local property tax base, and are at the heart of what residents love about living here.

Compared to surrounding communities, Charlemont has very little (only 4.3 percent) of its farmland in the Agricultural Preservation Restriction Program. However, nearly 44 percent of all of the privately owned undeveloped land in town is enrolled in the Chapter 61, 61A, or 61B programs. These private property owners continue to maintain their land in farms and forest and practice good stewardship.

One important message contained within the plan, is that the town's natural, agricultural and recreational resources should not be taken for granted. Thousands of acres of farm and forestlands remain highly vulnerable to development. Actions to address common threats to the region's rural character can be taken jointly by towns that share common goals. Charlemont is a community that is actively learning about, promoting, and practicing good stewardship of its natural and cultural resources.

SECTION 2

INTRODUCTION

In 2001, the Massachusetts Executive Office of Environmental Affairs (EOEA) sponsored-Deerfield River Basin Team secured funding for a watershed-wide open space and recreation planning effort that included the development of several municipal Open Space and Recreation Plans (OSRP). EOEA staff met with town officials and residents to determine their interest in working towards the completion of their own plan. Charlemont agreed to participate. The grant to assist Charlemont, Colrain, and Leyden in the development of their own OSRP was awarded to the Franklin Regional Council of Governments (FRCOG) Planning Department. Charlemont's inaugural OSRP was successfully completed and approved in 2004, after 18 months of public meetings and collaborative efforts. This inaugural OSRP underwent an update in 2024, the results of which are presented in the following document.

A. STATEMENT OF PURPOSE

The purpose of this plan update is to provide an accurate and thorough basis for decision-making involving the current and future open space and recreation needs of the residents of Charlemont. This OSRP represents the most important community and natural resource needs in town and on the best solutions for addressing them. The Five Year Action plan, when carried out by town boards, commissions, and volunteers will successfully implement the town's open space and recreation goals and objectives.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

In August 2024, an OSRP Committee composed entirely of resident volunteers was formed to update the town's Open Space and Recreation Plan. Through a series of public meetings, an all-board meeting, surveys and written feedback, and a review of recent statistics and documents, the OSRP Committee developed a set of goals and objectives that reflected the feedback and desires of the residents.

Public participation was encouraged through various methods, including promoting the OSRP survey online, in print, and verbally. Key documents were made available on the town website, and informational emails were sent before and after the public meetings. This was a significant and consistent vehicle for public participation in the development of the Open Space and Recreation Plan.

Overall, twenty-five different residents participated in at least one meeting and 25 residents completed the survey. Members represented different town boards, committees, and stakeholders including:

- Select Board

- Planning Board
- Conservation Commission
- Board of Health
- Agricultural Commission
- Broadband Committee
- Finance Committee
- Town Assessors
- Historical Commission
- Business owners, landowners, and farmers

Any comments expressed in public meeting, via survey, or in written form were recorded and included in Section 10 – Public Comments as well as in the final version of the Action Plan. Any ideas, comments, and corrections pertaining to different sections of the plan and the action steps have also been included in the final version of the Charlemont Open Space and Recreation Plan.

SECTION 3

COMMUNITY SETTING

The Town of Charlemont contains rural landscapes that have been established, developed, and affected by its human inhabitants over the past several hundred years. Planning for open space and recreation in Charlemont must account for the complex relationships between people and the open spaces and natural resources upon which they depend. Continued growth without consideration of the natural systems that need to be protected will reduce the quality of life for current and future generations.

The information provided in this section, Community Setting, uses a variety of sources, two of which are the 1998 Charlemont Master Plan Background Document and the 2001 Charlemont Master Plan. Both of these documents helped to inform the inventories and analysis of the human and land use components of Charlemont's landscapes.

This section provides an inventory and assessment of land use and landscapes in Charlemont, moving from the present, to the past, and to the future based on current development trends. *Regional Context* gives a snapshot of Charlemont today, and identifies the ways in which the location of the town within the region has affected its growth and the quality of open space and recreational resources. *History of the Community* looks back at how early residents settled and developed the landscape. *Population Characteristics* explores who the people of Charlemont are today and how population and economic trends may affect the town in the future. Finally, *Growth and Development Patterns* describes how the town has developed over time and the potential impacts of current land use regulations on open space and municipal services.

A. REGIONAL CONTEXT

The Town of Charlemont is a highland town located at the foot of the Berkshire Hills in western Franklin County. Charlemont is bordered by the Towns of Rowe and Heath on the north, Colrain and Shelburne on the east, Buckland and Hawley on the south, and Savoy and Florida on the west. State Route 2, also known as the Mohawk Trail, is the principal highway running in an east-west direction through Charlemont, linking the Town to Greenfield and Interstate 91 to the east, and North Adams and New York to the west. The principal highway running north-south is State numbered Route 8A connecting Charlemont with Heath and Vermont to the north, and Hawley to the south.

A.1 Natural Resources Context

In order to plan for the protection of open space and natural resources in the Town of Charlemont, residents may want to consider the role these natural resources play across the region. There are several ways residents can view their town's landscapes. Two of these are important in both Charlemont and in surrounding communities: abundant and contiguous forestland and watersheds. The presence and relatedness of these significant resources presents both opportunities and challenges to open space and recreation planning.

A.1.1 Large Blocks of Contiguous Forestland

Forests constitute one of the most important natural resources in the Town of Charlemont and the region. The Commonwealth of Massachusetts owns 1,902 acres (MassGIS) of forestland as part of the Mohawk Trail State Forest in the western half of Charlemont. The Department of Conservation and Recreation oversees this forestland and approximately 6,500 acres in the neighboring Towns of Savoy, Florida and Hawley. Other protected open space and natural resources in the region include Savoy Mountain State Forest in Savoy, Kenneth Dubuque State Forest in Hawley, and Catamount State Forest in Colrain.

Large blocks of contiguous forestland such as these are important regional resources for several reasons. First they represent an area with a low degree of fragmentation. Wildlife species that require a certain amount of deep forest cover separate from people's daily activities tend to migrate out of fragmenting landscapes. New frontage lots and subdivisions can often result in a widening of human activity, an increase in the populations of plants and animals that thrive alongside humans (i.e. raccoons and squirrels) and a reduction in the species that have larger home ranges and unique habitat needs. When these large blocks of forest are protected from development they help to protect and provide clean water, air, and healthy wildlife populations. In addition, as development fragments forests, it also reduces the viability of some types of forest management and harvesting regimes. As woodlands, valued for their hardwood and softwood timber are broken up through subdivision and development, the resulting ownerships (acres/lot) may not be large enough to support commercial harvesting operations.

Contiguous forest constitutes the backbone of any greenway or wildlife habitat planning effort in the region simply because it is the dominant vegetative community. The forestlands in Charlemont are part of significant regional greenbelts that have been recognized by the Massachusetts Natural Heritage and Endangered Species Program as providing habitat to viable populations of rare and endangered plant and animal species as well as buffering these unique habitats from human impacts like roads and development. Contiguous forest in Charlemont is part of the bridge, the connection of undeveloped lands across the regional landscape. The importance of the town's forested land will be addressed in greater depth in Section 4.

A.1.2. Watersheds

Watersheds are the areas of land that drain to a single point along a stream or river. Subwatersheds contain first and second order stream tributaries. A first-order stream flows from a single source; a second order stream starts at the point where two first-order streams meet. These small streams are the most extensive component of any watershed. They are also the most sensitive to land use, both the negative impacts of runoff and the positive effects of forest cover.

Two of the most important reasons to protect forests within the watersheds are preserving the long-term integrity of wildlife habitat and maintaining the quality of surface and ground waters.

The Town of Charlemont is located in the south-central portion of the Deerfield River Watershed, which encompasses all or part of twenty western Massachusetts communities and sixteen towns in Vermont. From Stratton Mountain in Vermont to the confluence with the Connecticut River in Greenfield and Deerfield, Massachusetts, the Deerfield River drains a regional landscape that is 665 square miles in size, 347 of which are in Massachusetts (DRWA; 2002). Its total river length is 70.2 miles, forty-four of which are in Massachusetts. The Deerfield River, one of the coldest and cleanest rivers in Massachusetts, has a steep gradient, dropping 46.8 feet per mile from its headwaters to the USGS gauge near the Town of West Deerfield, a distance of 69.5 river miles. This feature has made the Deerfield River a magnet for hydroelectric power generation, with ten hydroelectric developments constructed on the river since 1911. Given its gradient and excellent water quality, the Deerfield River has seen a long history of use by fishermen and whitewater enthusiasts. The Commonwealth of Massachusetts actively stocks the river to augment native populations in addition to stocking juvenile salmon, as part of the Connecticut River restoration project.

The Deerfield River is a major tributary of the Connecticut River. The Connecticut River Watershed is the largest river ecosystem in New England. The River enters Massachusetts through the Town of Northfield and drains all or part of forty-five municipalities before entering the State of Connecticut where it eventually empties into Long Island Sound at Old Saybrook.

While the Deerfield River Watershed is a viable management unit for state agencies like the Department of Environmental Protection, the subwatershed may be a more appropriate unit for the town to use in its planning. The subwatershed is the unit of choice for tracking potential impacts from development on the biodiversity and water quality of first and second order streams within the stream network. Subwatersheds also typically play an important role in the recharge of Charlemont's sole high yield aquifer. The town’s subwatersheds are covered in detail in Section 4-Environmetal Inventory and Analysis.

The degree of forest continuity, pattern of residential development, and the purity of the water in the Deerfield River Watershed are beyond the control of any one community. The Town of Charlemont could promote the conservation of all its significant open space and natural resources, but if surrounding towns fail to protect land, plan growth, or continue to monitor and participate in the cleanup of brooks and rivers, their level of impact on the resources that disregard political boundaries (water, wildlife populations, scenic views, trails, etc.) will be insignificant. Charlemont needs to take an active role in the conservation of regionally important natural resources, whether they occur in town or not.

A.2 Socio-Economic Context

The Town of Charlemont’s economy shifted from agriculture and industry to primarily a tourist/ recreation-based economy since the early part of the 20th century. The opening of the Mohawk Trail as an auto route in 1914 through the Deerfield River corridor and along the southern part of Charlemont, allowed tourists from Boston to New York access to Charlemont’s natural resources

for recreational purposes. Although World War II and construction of the Interstate 90 slowed tourist-related activities in the region in the mid-20th Century, tourism and recreation continue to be key to the local economy with approximately 71 percent of the jobs in town in the related Service and Trade industries.

Charlemont's population grew significantly in the past thirty years, and it is projected the town will continue to gain residents through 2010. Although the tourist and recreation industry grew during the past decade, the unemployment rate in Charlemont was generally higher than that of the State for the same time period. In 2000, the per capita income was lower than that of both County and State. Additionally, 10.4 percent of individuals, for whom the percent was estimated, live below the poverty level as compared to 9.4 percent for Franklin County.

Like many of the communities in the western and eastern edges of Franklin County, there has not been the same level of pressure to develop the open spaces of Charlemont for residential development in comparison to communities along the Interstate 91 corridor. Thus the community has an opportunity to protect natural, open space, and recreation resources in advance of the next surge in development. Currently, due to the local economy and lower property values relative to other areas in the region, development rights may be purchased at much lower rates than would be possible if the town or local land trusts were to wait for the need for land protection to become more apparent.

B. HISTORY OF THE COMMUNITY

Given the excellent fishing opportunities of the Deerfield and Cold Rivers as well as the hunting resources of the surrounding woodlands, it is believed the Town of Charlemont was the likely site of Native American settlement. It is probable the Native Americans used the Deerfield River floodplain at the confluence of the Cold River as a site for seasonal hunting and fishing camps. Other hunting and fishing sites may have been the areas between Zoar and Charlemont villages, near the confluence of the Deerfield River and Hartwell Brook, and the village of East Charlemont. Given their proximity to Charlemont, the Pocumtucks of Deerfield were most likely to have used these sites to a great degree. The Mohawk Trail, which cuts through Charlemont, was a regional corridor for Native Americans who traveled between the Hudson River Valley and the Connecticut River Valley.

Colonial settlement began in Charlemont in 1740 with Moses Rice constructing the first home at the foot of Warfield Mountain. Shortly thereafter, Othniel Taylor built a home in East Charlemont. The attack of Fort Massachusetts by French and Indian forces necessitated the abandonment of these homes in 1746. Resettlement of the area did not occur until 1749, and no major expansion of settlement occurred until the early 1760s. Although agriculture was the primary economic activity of the early settlers, Moses Rice built the first gristmill soon after settling in Charlemont. Given the abundant water resources of the town, other mill operations including sawmills and gristmills, soon followed.

During the Federal Period (1775-1830), Charlemont's population grew significantly. There were two commercial village centers, the primary one being at Charlemont Center with the second

being in East Charlemont. East Charlemont was also the center of industrial activity. A smaller mill center was also located in the village of Zoar in the western section of town. Agriculture, in the form of dairy and sheep farms, was also important.

Charlemont in the Early Industrial Period (1830-1870) did not have access to the economic benefits of the Troy and Greenfield Railroad until 1868, which was thought to be one of the main reasons the town did not see the growth of industry as expected. This rail line later connected Charlemont to North Adams via the Hoosac Tunnel (c. 1875). In spite of this development, agriculture continued as the town's economic base.

By 1875, at the start of the Late Industrial Period (1870-1915), Charlemont's industrial base was limited to several sawmills, two scythe snathes shops and a chair making operation. With the opening and success of the nearby Davis iron pyrite and talc mine in Rowe in the 1880s, a prospecting craze developed in the area. Mining operations were also opened in Charlemont during this period and included the Massachusetts Talc Company in the village of Zoar. The merchants of Charlemont Center benefited greatly from this prospecting craze. Several merchant shops still present in town include Tyler's Store and Post Office (c. 1840s), Wells Corner Store (c. 1845), and the W.E. Niles House and Storefront (c. 1840). Two other shops opened in the early 1890s, which were important to the town's economy for a number of years. In 1891, W.M. Pratt established a rake handle factory and the following year, H.H. Frary opened a carriage shop, which also produced wooden spools for the silk mills in Northampton. In 1912, the Massachusetts Highway Commission approved the upgrade of the Mohawk Trail through the Deerfield corridor to accommodate automobiles. When construction was completed in 1914 the auto route, which extended along the Deerfield River in Charlemont to the base of Hoosac Mountain in North Adams, opened the steepest section of the Mohawk Trail to automobiles. This road also formed the connecting link of state highway from Boston to New York. Agriculture remained a primary economic activity in Charlemont through the mid- 20th century.

In modern times Charlemont's economy shifted from agriculture and industry to a tourist/recreation based economy based upon its natural resources. The second home and short–term rental movement, generated in part by the recreation and tourism industries, will continue to impact Charlemont. Today, recreation related businesses such as Berkshire East Mountain Resort, Crabapple Whitewater and Zoar Outdoor contribute greatly to the local economy. Going hand in hand with the recreation industry is the lodging and restaurant industry, which is also important to Charlemont's economy.

Charlemont's Town Center was designated as a National Historic District in 1985. The town's two other villages, Zoar and East Charlemont do not have their own historic districts but are home to many historical structures. The Charlemont Master Plan Background Document contains many records of historical structures and historic sites and these are included in the Appendix.

C. POPULATION CHARACTERISTICS

In this section, Charlemont's needs for open space and recreational resources are assessed based upon an analysis of demographic and employment statistics. The demographic information

includes changes in total population, changes in the relative importance of different age groups in town, and potential changes in development patterns due to shifts in the local economy.

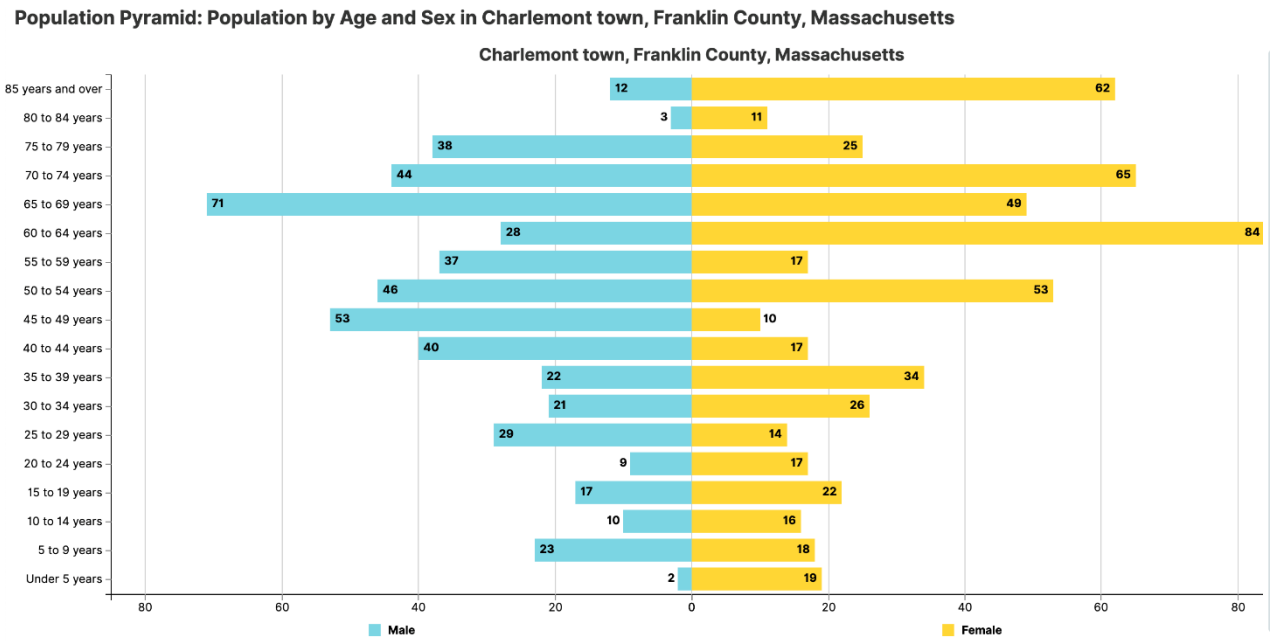
C.1 Demographic Information

C.1.1 Population and Population Change

Demographics can be useful for forecasting the potential need for open space and recreational resources that will be required by residents. During the ten-year period 1970-1980, the Town of Charlemont saw an increase in population from 897 in 1970 to 1,149 in 1980, an increase of 252 residents or 28.1 percent. The next two decades, 1980-2000 again saw a large increase in population of 209 residents or 18.2 percent. From 2000 – 2020, the population has decreased. According to the U.S. Census, Charlemont had 1,185 residents in the year 2020. Thus, over the previous twenty years, 2000-2020, the Town of Charlemont saw a total decrease of 12.74% percent in the number of its residents. Franklin County experienced a decrease in population of less than 1% in the same time period, while the Commonwealth of Massachusetts saw a 10% increase in population.

Using projections from the UMass Donahue Institute (UMDI), the town's population will experience a decrease during the ten-year period 2020-2030. UMDI projects the Town of Charlemont will decrease by 162 residents or 13.7 percent of its population (See Table 3-1). This will be in contrast to Franklin County, which are expected to have a population decrease of 2.4 percent and the Commonwealth of Massachusetts, projected to increase by 1.1 percent.

The UMDI methodology assumes the continuation of existing growth trends. There is significantly more uncertainty for smaller towns due to small sample size and random variability. The population trend of the growth of the elder segment of the population in the county and the state continues into 2020. Charlemont's median age of 56.7 years which is 20% higher than Franklin County and 104% higher than that of the Commonwealth. The median age was up by 10.5% across the Commonweath of Massachusetts, double that in Franklin County increasing 20.8%, and doubling again for Charlemont, which increased its median age by 47.7%!



Both the 45-64 year age group and the 65+ year group are both growing in the county and the state. In Charlemont, the 45-64 year age cohort decreased by 8.1 percent, while the 65+ age cohort grew by an astonishing 142 percent between 2000 and 2020 (See Table 3-2). The 65+ category was in fact the only age cohort that grew in Charlemont over the last 20 years and is the largest demographic age cohort. The Town of Charlemont needs to be concerned about providing for an aging population in its open space and recreation programming as well as programming to retain and draw younger age cohorts.

Table 3-2: Number of People by Age Cohort Between 2000 and 2020 in Massachusetts, Franklin County, and in Charlemont

	Massachusetts Population		% Change	Franklin County Population		% Change	Charlemont Population		% Change
Age Cohort	**2000**	**2020**		**2000**	**2020**		**2000**	**2020**	
0-19 years	1,675,113	1576509	-5.9%	18,502	13262	-28.3%%	381	127	-66.7%
20-44 years	2,394,062	2354931	-1.6%	28,635 24,303	20686	-14.9%	463	229	-50.5%
45-64 years	1,419,760	1857176	30.8%	18,550	20,586	11%	357	328	-8.1%
65+ years	860,162	1195589	39%	10,180	16446	65.6%	157	380	142%

Source: U.S. Census, 2000 and **ACS 2022 5-year*** ** The +/- error bars on all data derived from the 2020 U.S.Census are significant!

Seniors require different recreational facilities and services including accessible walking paths, arts, and leisure programs. Our open space and recreation objectives should support the development of parks, pedestrian facilities, and elder-friendly leisure activities.

Feedback points to the need for recreational facilities and programs for residents of all ages including access to open space. A well led Parks and Recreation Department, that visibly promotes the availability of the existing recreation facilities, could galvanize the varied interests in providing safe places, programs and access to activities and open spaces for the benefit of all residents.

Sites such as the Mohawk Trail State Forest (6,457 acres), Zoar Picnic Area (187 acres), Charlemont Fairgrounds (20 acres) are open to the public with an informal 'Dog Park' at the Charlemont Fairgrounds.

Charlemont has a diversity of recreational spaces and opportunities. Berkshire East Mountain Resort provides skiing programs for school children with subsidies available to Hawlemont students and bike trails open to the community. Zoar Outdoor offers afterschool programs for MTRSD and the Academy at Charlemont, as well as summer kayaking camps with low-income scholarships available. The town can continue to develop relationships with local businesses and organizations to encourage reduced rates for town residents.

In addition, there are a number of recreational activities that are open to the general public. Individuals, volunteers, and businesses sponsor these activities, which shows that there may be room for additional recreational opportunities for residents of all ages with a little leadership. Existing organized recreational activities include:

- Mohawk Trail Concert Series-Classical music in the summer and fall at the Federated Church
- Charlemont Reggae Fest-Music Concert at the Charlemont Fairgrounds in September
- American Whitewater Association Festival Riverfest
- Pickleball, basketball, and volleyball in the Hawlemont school
- Annual town picnic at the Charlemont Fairgrounds

Identifying the best location for new open space and recreation resources should consider where people live and the special needs of its citizens. As will be seen in the fourth part of Section 3, Growth and Development Patterns, future growth depends in large part on zoning, soil and groundwater related constraints, and on which lands are permanently protected from development. Town Officials could identify key parcels in town that might be future parks and walking trails close to neighborhoods and areas that could be developed for compact residential uses. Officials could be looking for opportunities to conserve land in Charlemont in a way that protects valuable scenic and natural resources and provides public access to trail networks and future parks and conservation lands.

Whatever the generational make up of the future community, recreation and open space needs may change over time. What would Charlemont's response be to potential increasing and changing needs? How can these services and facilities be created in an efficient, economical and sustainable manner? The answers to these questions may depend in part on the current and potential economic and financial well being of Charlemont and its residents.

C.1.2 Economic Wealth of Residents and the Community

Measures of the income levels of Charlemont residents as compared to the County and State are helpful in assessing the ability of the citizenry to pay for recreation resources and programs and access to open space through property taxes or directly through the use of fees.

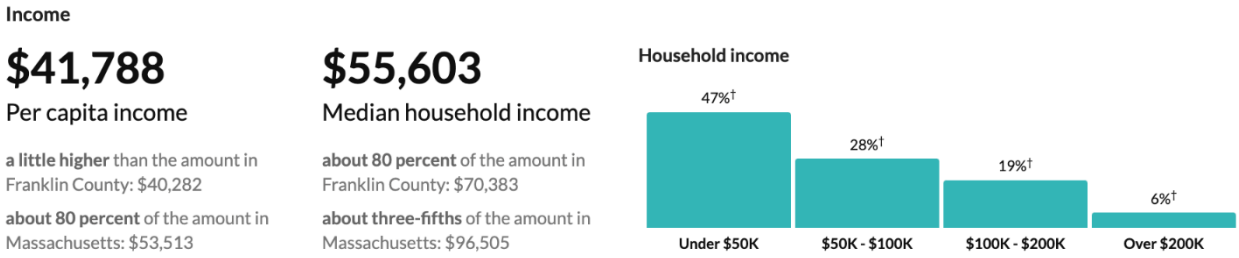


Table 3-3: Median Household Income, Per Capita Income, and Percentage Below Poverty Level in 2022 for Charlemont compared to Franklin County and the State

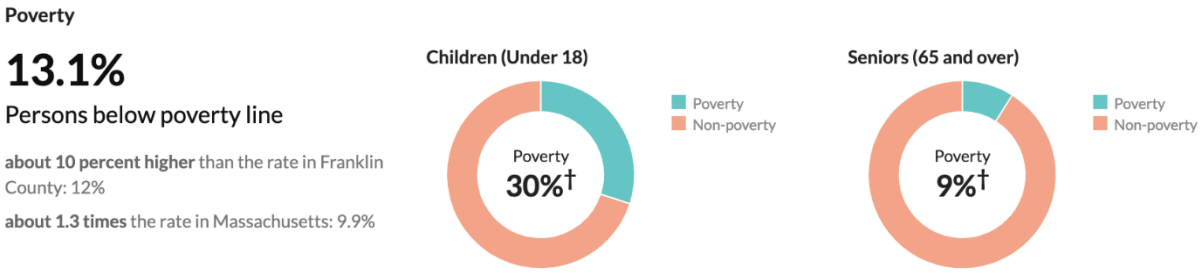
	Median Household Income	Per Capita Income	Percentage Below Poverty Level*
Charlemont	$55,603	$41,788	13.1%
Franklin County	$70,383	$40,282	12%
Massachusetts	$96,505	$53,513	9.9%

Source: U.S. Bureau of the Census, Census 2020. *Percentage of individuals living below poverty level for which the poverty status has been determined. ** All data related to the 2020 census have significant margins of error associated with the data.

Table 3-3 describes the earning power in Charlemont as compared to the County and the State. According to Census 2020 figures, Charlemont households earn incomes that are about 80 percent of the amount in Franklin County and about three-fifths of the amount in Massachusetts.

The per capita income for the town (total income for all residents divided by the total number of men, women, and children) is a little higher than the amount in Franklin County and about 80 percent of the amount in Massachusetts.

The percentage of people living below poverty level in Charlemont is about 10 percent higher than the rate in Franklin County and about 1.3 times the rate in Massachusetts. 30% of Charlemont children (under 18) and 9% of Charlemont Seniors (65 and over) live below poverty level.



Residents may be willing to consider spending limited tax dollars on targeted recreational programming and facilities.

Although Charlemont's resources today are clearly both its people and its natural landscapes, the status of the town's finances could be affected by an interdependent relationship that exists between the two. Costly community services provided to residents and businesses are paid for with the tax revenues generated by different kinds of property, both developed and undeveloped. In 2024, commercial and industrial property taxes accounted for 8.85% of taxes, personal property taxes of 10.55% with the remaining 80.6% paid by residential property owner. One reason that towns encourage economic development is to have some other type of property to share the tax burden carried by residential property owners and caused by associated education and public works costs. Protected open space provides a meager amount of tax revenues and reduces the amount of new construction that can occur.

C.2 Employers and Employment Statistics

C.2.1 Labor Force: Charlemont residents that are able to work

In the year 2023, the Town of Charlemont had a labor force of 650 with 623 residents employed and 27 unemployed (Massachusetts Division of Employment and Training). This is equal to a 4.2 percent unemployment rate for the town. The Commonwealth of Massachusetts' unemployment rate was lower at 3.4% percent while Franklin County's unemployment rate was lower still at 2.9 percent. Table 3-5 shows that the number of residents in the labor force and employed in Charlemont reached a peak in 2018 and that the town's unemployment rate increased by 0.3% percent between 2016 and 2023.

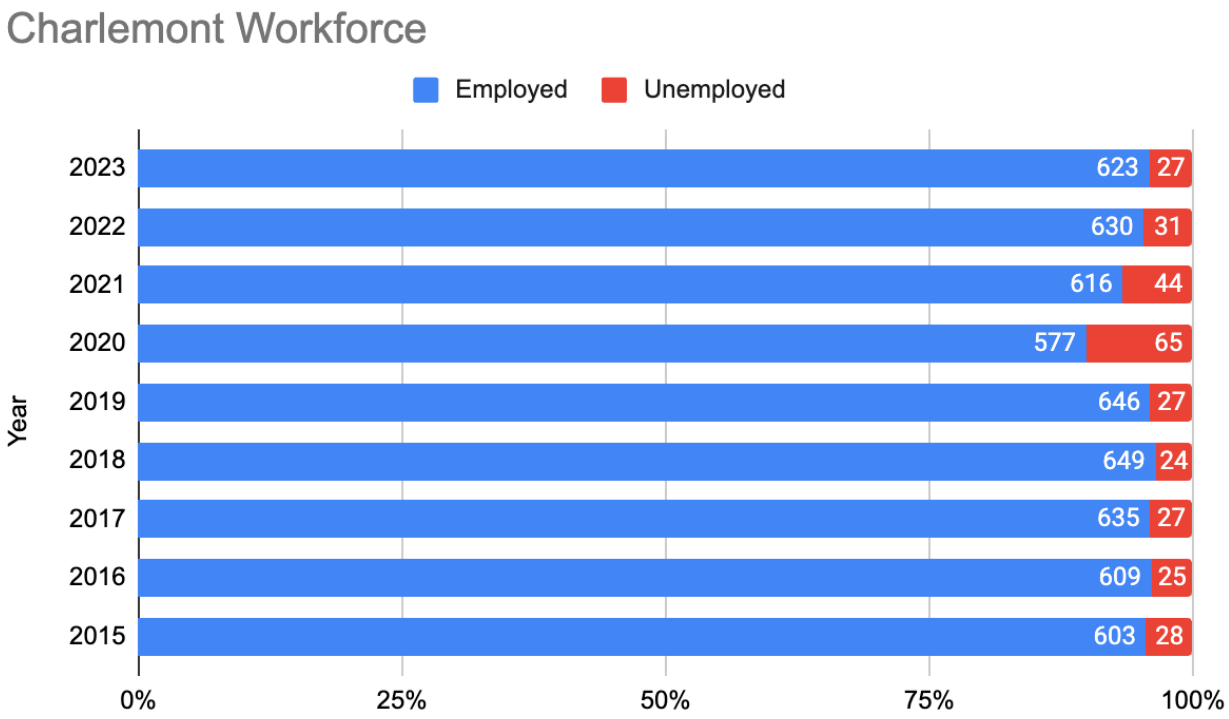


Table 3-4 also shows the unemployment rates for Franklin County and for the Commonwealth of Massachusetts during the same time period. Charlemont residents have been successful at gaining employment over the last decade, though the unemployment rate for the town exceeded the averages for the county and state most of the time. Overall, the town receives more benefits when residents are employed than not. When residents are employed, earning a decent wage, they are more apt to own homes, pay property taxes, and volunteer their time, skills and interest in the community. On the other hand, if the unemployment rate in town is very low, an expanding local business might need to consider the regional labor pool to fill new positions.

Table 3-4: Labor Force and Unemployment Rate in Charlemont, Franklin County and the Commonwealth of Massachusetts 2016-2023

	2016	2017	2018	2019	2020	2021	2022	2023	2016-2022 Change	% Change
Number of People in the Labor Force and Employed	609	635	649	646	577	616	630	623	21	3.4%
Number of People in the Labor Force and Unemployed	25	27	24	27	65	44	31	27	6	25%
Charlemont Unemployment Rate	3.9%	4.1%	3.6%	4.0%	10.1%	6.7 %	4.7%	4.2%	0.3%	N/A

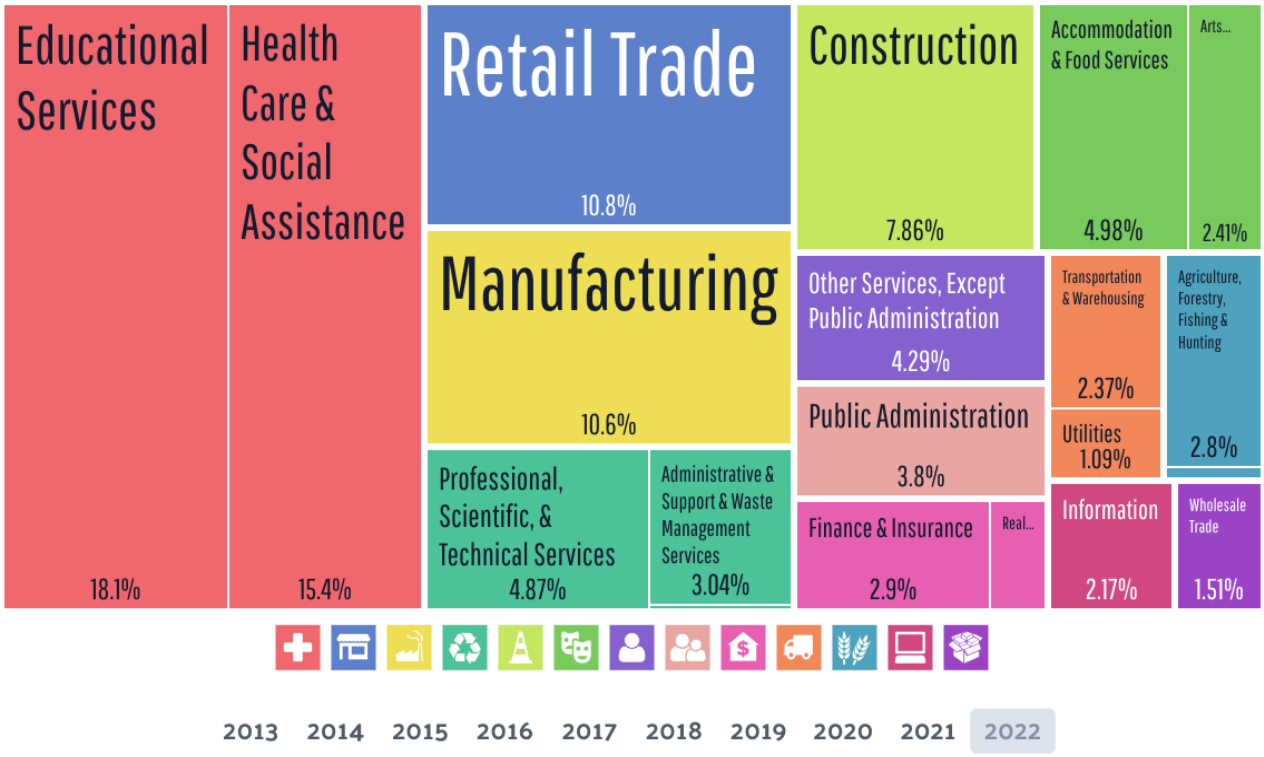
Franklin County Unemployment Rate	3.6%	3.4%	3.1%	2.8%	7.9%	4.7 %	3.3%	2.9%	--0.7%	N/A
Massachusetts Unemployment Rate	4.0%	3.8%	3.5%	3.0%	9.3%	5.4 %	3.7%	3.4%	-0.6%	N/A

Source: Commonwealth of Massachusetts, Division of Employment and Training (Local Area Unemployment Statistics), 2023.

C.2.2 Employment in Charlemont: People who work in town, whether they are residents or not.

Table 3-5 depicts sector employment in the County and State as a percentage of total employment. The table demonstrates that the Educational Services, & Health Care & Social Assistance, Professional and Administrative Services, Trade and Manufacturing sectors on both the State and the County levels produced the highest percentage of total employment in 2022, together combining for over 70 percent in the state and county. It can be said that the county has a strong manufacturing sector, since it has a higher percentage, or share, of total employment in this sector than the state average. In other words, Franklin County employs more people in manufacturing jobs than the average in other counties in Massachusetts. The county has slightly increased the percentage of jobs in manufacturing since 2016, the sector still employed 10.6% of the people in the country in 2022. Whereas, the state, employed only 9.3% percent of its total workers in industries in the manufacturing sector (See Table 3-5). Using the same comparative analysis, other competitive sectors in the county are Agriculture and Construction. Since these sectors are employing more people in the county than in the state, it is likely that they are producing more goods and services than their counterparts in other areas of the state. Therefore, it can also be said that these sectors are most likely exporting their goods and bringing money into the region.

Franklin County



Another important technique for determining the relative strengths and weaknesses of the county employment sectors as compared to the state is to analyze the shifts in employment over time. This method also shows that manufacturing is relatively strong in Franklin County. For example, during the period from 2014 to 2022, the county's manufacturing sector gained 0.2 percent of its jobs, while the sector in the state as a whole lost 0.3 percent. Agriculture and Construction increased more significantly in the county than in the state as a whole in the same time period.

Table 3-5: Employment by Industry Sector for Franklin County and State of Massachusetts as a Percentage of Total Employment, 2014 and 2022

Industry Sectors	2014 Franklin County	2022 Franklin County	2014 Massachusetts	2022 Massachusetts
Agriculture, Forestry, Fishing & Hunting, & Mining	2%	2.9%	0.3%	0.4%
Recreation, Accommodation, Dining, Arts, Entertainment	8.4%	7.4%	8.8%	7.8%
Educational Services, & Health Care & Social Assistance	34.3%	33.5%	28.6%	28.6%
Services: Professional, Information, Scientific, Other	13.9%	14.4%	18.7%	19%
Trade (Retail/ Wholesale)	13%	12.3%	13.3%	13.5%
Manufacturing	10.4%	10.6%	9.6%	9.3%
Construction	6.3%	7.9%	4.6%	5.4%
Public Administration	4%	3.8%	4.3%	4%
Finance & Insurance, and Real Estate, Rental & Leasing	4.1%	3.7%	7.6%	7.3%
Transportation, Warehousing, and Utilities	3.6%	3.5%	3.7%	4.2%

Source: County Business Patterns 2014 and 2022, Bureau of the Census.

Local employment information provided by the Massachusetts Division of Employment and Training is incomplete.

Charlemont's economy was once dominated by agriculture and to a lesser extent, commerce and manufacturing, both of which relied on the town's natural resources. Today, the economy continues to be dependent upon these natural resources, but the dominant sector is clearly the service sector comprised of recreation and tourism-based businesses.

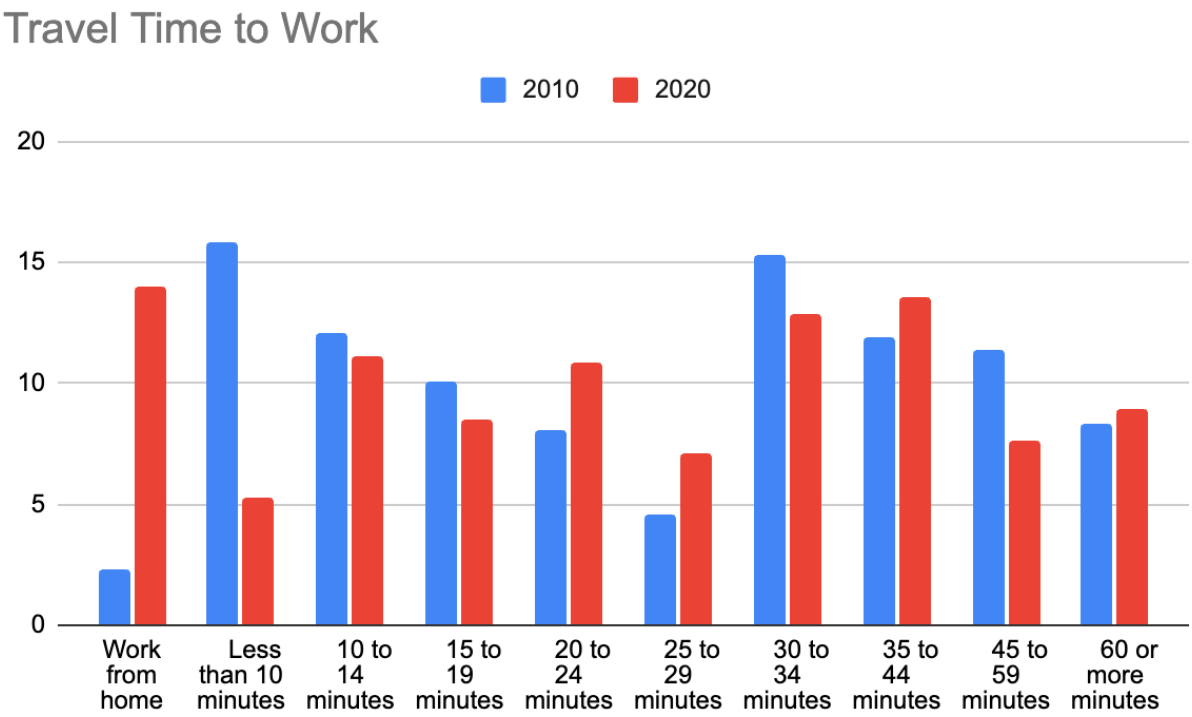


Table 3-6: Travel Time to Work for Workers 16 and over, 2010, 2022

Travel Time to Work		
	2010	2022
Total Workforce over 16	603	449
Total Commuting Workforce	589	386
Work from Home	2.3%	14%
Less than 10 minutes	15.8%	5.3%
10 to 14 minutes	12.1%	11.1%
15 to 19 minutes	10.1%	8.5%
20 to 24 minutes	8.1%	10.9%
25 to 29 minutes	4.6%	7.1%
30 to 34 minutes	15.3%	12.9%
35 to 44 minutes	11.9%	13.6%
45 to 59 minutes	11.4%	7.6%
60 or more minutes	8.3%	8.9%
Mean travel time to work for commuters (minutes)	29.3	32.7

According to the 2020 U.S. Census, Charlemont residents were far more likely to work from home than in 2010 (See Table 3-6), a rate similar to the county and slightly ahead of the country while lagging behind the state rate by about 10%. From 2010 to 2022 there have not been significant shifts in commuting patterns when factoring in the growth of the work at home segment.

What are the implications of commuting time changes to open space planning? If people are more willing to commute longer distances to go to work, are able to tele-commute, or have their own home business, they are less likely to choose their place of residence based on its proximity to a regional employment center. Places that offer a high quality of life with plenty of forests, farms and scenic views like Charlemont may become more in demand by these types of workers, which could result in added development pressures.

C.2.3 Employers in Charlemont

The FRCOG staff published a list major employers with at least ten employees and determined the types of employment offered at each business (See Table 3-7). Government, and educational services businesses provide the most full-time employment, which is more likely to include benefits and additional training opportunities while retail trade and service sector businesses provide mostly part time or seasonal employment.

Table 3-7: Major Employers in Charlemont, 2022

MAJOR EMPLOYERS IN COMMUNITY 2022	
Employer	Employment
Berkshire East Mountain Resort	100-249
Crab Apple Whitewater	20-49
Town of Charlemont	20-49
Hawlemont Regional Elementary	20-49
Academy At Charlemont	20-49

Source: https://frcog.org/wp-content/uploads/2023/03/charlemont.pdf, Data Axle 2022

Opportunity exists to encourage existing recreational-based tourism businesses as well as expand locally owned small businesses in the service fields. Whenever town resources are applied to economic development, no matter the sector targeted for support, it is important to consider the types of jobs to be created. Full time jobs typically pay more and provide benefits. Part time and seasonal jobs provide flexible employment and less pay. Both types of jobs may be in demand but clearly full-time jobs create a more stable economy.

D. GROWTH AND DEVELOPMENT PATTERNS

The Town of Charlemont has a population density of 48 people per square mile (Commonwealth of Massachusetts Department of Housing and Community Development).

Households

540

Number of households

Franklin County: 31,234

Massachusetts: 2,740,995

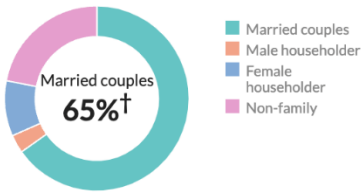
2

Persons per household

about 90 percent of the figure in Franklin County: 2.2

about 80 percent of the figure in Massachusetts: 2.5

Population by household type



D.1 Patterns and Trends

The Town of Charlemont developed from a sparsely populated agricultural community to one with several early commercial and industrial centers dependent both on the waterpower of rivers and wood and mineral deposits from local forests. These commercial and industrial activities helped to establish the villages of Charlemont Center, Zoar and East Charlemont. The Troy and Greenfield Railroad and Rte. 2 both provided access for residents and visitors to move in and out of the region. Despite the development of manufacturing and transportation facilities, agricultural remained the basis of the economy well into the 20th century.

By the early 20th century, Charlemont had become a rural recreational center as use of the Rte. 2 Mohawk Trail by tourists peaked. Berkshire East Ski Area began in the 1950s while Zoar Outdoor started in 1989. According to the 1998 Master Plan Background Document, these two businesses combined with another recreational-based business, Crab Apple Whitewater (established in 1990), grossed between 17.5 and 35 million dollars in 1997. Charlemont has primarily a tourist-based economy. One example that shows the importance of tourism in Charlemont is reflected in its 1999 zoning by-laws. Criteria for granting a special permit by the Planning Board includes the impact the activity, site plan, and building design may have on existing and future tourism.

Computer mapping technology called Geographic Information Systems (GIS) can be used to develop and display spatial information helpful for analysis in many types of planning. Land use GIS maps show where forest, cropland, residential, commercial, and industrial development occur within a town or region. The shapes depicted on a land use map are called polygons and are created from aerial photographs. For example, a single-family home built on a lot with frontage on a main road and surrounded by forest, or cropland, could be described as a polygon of a ½ acre of residential use. By comparing land use maps from two different years, in this case 1971 and 1999, it is possible to see the areas of land that changed uses, from pasture to forest, and from forest to residential uses. Over the past thirty years there were changes in land use at the following locations:

- Tower Road: Conversion of open land to pasture and cropland.
- Western Charlemont: Pasture and open land converted to forest, expansion of mobile home park, and residential development of ½ acre in size or more on frontage lots (referred in the following bullets as approval-not-required (ANR) large lot development).
- Rowe Rd.: Expansion of mining areas.
- Schaefer Way: Large lot ANR.
- At base of Legate Hill Rd. and Rte. 2: Conversion of cropland to large lot residential uses.

- Legate Hill from Rte. 2 to town's border with Rowe: Conversion of forest to ANR development.
- Potter Rd.: Conversion of forest and pasture to large lot residential uses.
- Warner Hill Rd.: A fair amount of crop and pasture converted to ANR development and some pasture returned to forest.
- In Charlemont Center, south of Hawlemont School: Conversion of urban open land and spectator recreation land to participatory recreation land.
- North of Charlemont Center, off Warfield Rd.: Conversion of cropland to pasture and ANR uses and, of forest to pasture.
- Off North Heath Road: Land converted from spectator to participatory recreation uses, reduction in mining uses, conversion of forest and cropland to ANRs, some crop to forest changes, and the development of large lot residential uses within forestland back off the road.
- Near the Academy: Expansion of ANR developments off Burrington Rd.
- Mountain Road: Conversion of forest and cropland to ANR development and from cropland to pasture.
- Traveling east along Rte. 2: Conversion of pasture to cropland, forest to large lot ANR uses, and forest to participatory recreation.
- Off Avery Brook: Very little change, except for the development of two ANR house lots within forest.
- West Oxbow Rd.: Near Rte. 2, the conversion of cropland to participatory recreation land and from forest to ANR uses.
- East Oxbow Rd.: Most significant conversion of forest to large lot residential development on Hawks Hill and Deer Run Lane.
- Heath Stage Terrace and River View Rd.: Conversions of cropland to ¼ to ½ acre residential uses, open land to commercial uses, and forest to large lot ANR uses.
- North River Rd.: Conversion of spectator recreation uses to open land and of forest to ANR development.

Between 1971 and 1997 the predominant land use change in the Town of Charlemont has been the conversion of forest to residential development on ANR frontage lots. Another important change is the increase in participatory recreational uses. The locations of the ANR lots are spread throughout town with an atypical concentration in East Charlemont off Hawk Hill and Deer Run Lane. Between 1985 and 1999, the loss of forest was equal to 166 acres while the gain in large lot residential development was 190 acres. According to the U.S. Census, there was a gain of only 27 housing units between 1990 and 2000, which implies that much residential development happened in the late 1980s.

Charlemont is likely to continue seeing the trend of large lot residential development on ANR lots, scattered throughout the town. From 2016 to 2024, 20 new ANR lots were created, including 9 lot splits, 2 fully developed and sold properties, and 1 lot split from a parcel later enrolled in Chapter 61B (forestry use). If this trend continues, the town may face ongoing distributed development unless efforts are made to direct growth to more concentrated areas.

D.2 Infrastructure

Infrastructure plays a vital role in current and future development patterns.

D.2.1 Transportation Systems

There are two principle highways in the Town of Charlemont, State Route 2 and State-numbered 8A. State Route 2, also known as the Mohawk Trail, is the primary east-west highway in Northern Massachusetts. It passes through Charlemont Center and the southern section of the town. Route 2 connects Charlemont to Greenfield and Interstate Route 91 to the east, and with North Adams and New York to the west. State numbered Route 8A, is a town-owned route with state designations, which travels in a north-south direction and connects the Town of Charlemont to Heath and Vermont to the north and Hawley to the south. It too passes through Charlemont Center.

Charlemont is serviced by the Franklin Regional Transit Authority (FRTA), which provides fixed route service between Charlemont and Greenfield. The FRTA also provides on-demand service for people with disabilities and the elderly.

The Springfield Terminal Railway (the former Boston and Maine Corp.) passes through the Town of Charlemont along Route 2. It does not, however, service commercial or industrial interests in town.

According to the Massachusetts Department of Housing and Community Development website, the nearest airport servicing the Town of Charlemont is located in North Adams. The Harriman and West Airport is a general aviation facility capable of accommodating small aircraft.

D.2.2 Water Supply Systems

The Town of Charlemont does not have a municipal water supply. All residences and businesses are served by private wells.

D.2.3 Wastewater Treatment and Sewage Systems

The Charlemont Wastewater Treatment Facility serves approximately 110 houses and a handful of small businesses in the downtown area. The facility presently has a maximum capacity of 50,000 gallons of influent per day and utilizes biological processes to treat received wastewater in recirculating pebble filters to provide a clean effluent which is released into the Deerfield River. Since the construction of the Charlemont Wastewater Treatment Facility in 1991, the system has played a major role in keeping the Deerfield River clean which has contributed to an increase in river-related recreational activities and businesses. Conversely, the limited capacity of the system places a cap on potential development and use.

The last evaluation of the facility indicated that the system was at 65% capacity and in the past the Charlemont Sewer District had refused connection to large businesses and new construction outside the district. With this in mind, the Charlemont Sewer District is currently researching ways to increase the capacity of the facility while remaining within its small footprint to ensure that this is not an obstacle for future development.

Charlemont also has approximately twenty home septic systems available at Berkshire East as part of a system located in the Berkshire East Parking Lot. This project was to allow Berkshire East to use capacity on the system and allow for Charlemont Residents in the vicinity of South River Road and East Hawley Road to use the excess capacity which equates to 6,600 gallons of flow available for 20 ANR lots or 60 Bedrooms. This will be available on a first come first serve basis, with the connecting parties bearing the cost of the connection, and the proportionate share of the future costs of operations.

D.3 Long-term Development Patterns

Long-term development patterns in Charlemont will be affected by both existing and future land use controls, including zoning; by the permanent protection of more land; and, by potential changes in transportation and sewerage infrastructure.

D.3.1 Land Use Controls

Residential development of frontage lots on existing roads will likely be the dominant short-term development pattern given current zoning. Charlemont's zoning includes a single Residential/Agricultural district. The zoning bylaws also include several measures that may influence long-term development patterns: Minimum lot area with conditions; Special Permit Criteria; Erosion Control; and Cluster Development.

Table 3-9: Selected Features of the Residential Agricultural District

Dimensional Requirement	Slope, Soil,Percolation Rate Conditions Adequate	One or more of the Slope, Soil, Percolation Rate Conditions Inadequate
Min. Lot Area (sq. ft.) for Single-Family	45,000 sq. ft.	66,000 sq. ft.
Min. Lot Area (sq. ft.) for Two-Family	60,000 sq. ft.	88,000 sq. ft.
Min. Lot Area (sq. ft.) for Three-Family	75,000 sq. ft.	110,000 sq. ft.
Min. Lot Area (sq. ft.) for Non-Residential Use with capacity of <2,000 gal. on-site waste water /day	45,000 sq. ft.	66,000 sq. ft.
Min. Lot Area (sq. ft.) for Non-Residential Use with capacity of ≥2,000 gal. on-site waste water /day	90,000 sq. ft.	132,000 sq. ft.
Min. Lot Frontage for all Lots & Uses	150 ft.	150 ft.
Min. Front Yard off Rte. 2	75 ft.	50 ft.
Min. Front Yard off all other roads	50 ft.	50 ft.
Min. Side Yard	25 ft.	25 ft.
Min. Rear Yard	25 ft.	25 ft.

Source: Town of Charlemont Zoning By-Laws; October 19, 1999.

Minimum Lot Area with Conditions

The basic minimum lot size is 45,000 sq. ft. if certain conditions are present (See Table 3-9). The ground that will be disrupted due to construction should have an average slope of 15 percent or less. Depth to bedrock, hardpan or the high water table should be at least six feet. Finally the soils should percolate at rates of ten minutes per inch or less. If any one of these conditions is not present, the basic minimum lot size of 66,000 sq. ft. is applied. The general purpose behind such measures is likely to ensure that on-site septic systems do not contaminate groundwater and private wells.

Increases to the basic minimum lot size, whether the lot has constraints or not, are also applied to residential development of two and three-family units, to mobile home parks, campgrounds, and motels. Non-residential uses enjoy the basic minimum lot size as long as the capacity of their on-site septic systems is less than 2,000 gallons per day. If not, the commercial, industrial, or institutional use must be built on lots at least 90,000 sq. ft. in size were none of the site constraints present.

The single minimum frontage (150 ft.) and the basic minimum lot size ensure that new lots will be in one consistent pattern all over town, despite traditional changes in density between rural outlying areas and the villages. Villages tend to have a variety of structures on lots smaller than an acre in size, while working farms and forests typically produce a sparsely developed rural landscape. In the future, there may be a desire for smaller frontage requirements (e.g. 75 or 100 ft.) in village areas and larger frontages (200-300 ft.) in the rural areas. Another interesting measure in the zoning rests in the requirement that two-and three-family homes, even where connected to sewer, would still be required to be on 60,000 sq. ft. and 75,000 sq. ft. lots with frontages of 150 ft. Typically, communities interested in promoting development patterns that result both in economic vitality and the preservation of open space seek a variety of development densities, including dense mixed use traditional village centers where residents can support nearby commercial businesses.

Special Permit Criteria

The Special Permit Criteria listed in the Zoning By-Laws identify factors that would be considered in the Planning Board's decision to grant a use that is not allowed by right in Charlemont. These uses are varied from three-family homes, mobile home parks, structure heights greater than 32 ft., to accessory scientific research or development. The Special Permit Criteria provide the Planning Board the basis for protecting undeveloped lands with special or unique cultural, ecological, or recreational values as well as the town's rural character and environmental quality overall. The Special Permit Criteria include impacts on:

- Development of tourist activities;
- Capacity of the town to meet service needs;
- School facilities;
- Abutting lands in regards to sound, light, odor, noise, etc.;
- The natural landscape including habitats, trees and plants; and whether the project causes erosion, siltation and increased stormwater runoff;
- Safety;

- Neighborhood and community character; and,
- Employment and fiscal integrity.

Erosion Control
This measure authorizes the Building Inspector to require any development to ensure that soil erosion and excessive stormwater runoff will be minimized. In addition, the measure requires a special permit for any grading or construction on land with slopes over 25 percent. This does not restrict all development along ridgelines but does provide the town with an opportunity to focus development in more appropriate upland areas.

Cluster Development
The Cluster Development measure requires a special permit to be granted by the Planning Board for the development of parcels at least 5.2 acres for lots with no constraints or 7.6 acres for lots with constraints. The measure allows for a 20 percent increase in density beyond the basic minimum lot size, as long as the amount of open space created by the development is at least 30 percent of the total parcel size. For a 5.2-acre parcel, a developer would need to set aside 1.6 acres. No minimum lot size applies, but the 20 percent increase in density would result in only four 36,000 sq. ft. lots. A 5.2-acre roadside parcel with the necessary frontage could fit five 45,000 sq. ft. lots, while a traditional subdivision of the same size would likely provide the same number of lots as the cluster, but at the minimum lot size. In addition, there is no mention of the protection status of the open space or of a minimum upland percentage requirement. Charlemont may want to consider revising the cluster development measure to ensure that it provides more incentives for its use, and at the same time, ensures upland is protected, not wetlands, which are already protected from development.

Charlemont's zoning by-laws will create a pattern of development very different from its historical patterns. It encourages scattered residential development on all roadways including Rte. 2. Charlemont's zoning by-laws are designed to retain the town's rural character while encouraging much needed residential development. Unless this occurs, Charlemont will likely experience distributed development of predominantly single-family residential development on lots of 1 –1 ½ acres in size over much of the developable acreage. The potential results of this type of development pattern are reflected in the following build-out analysis.

D.3.2 Build-out Analysis

To illustrate the long-term effects of current zoning, results of a 1997 build-out study are included here. An updated analysis will be pursued as one of the action items in this 5 Year Action Plan.

This aforementioned study is part of a State-wide effort funded by the Executive Office of Environmental Affairs. The methodology and results of the build-out study and associated GIS mapping is explained below.

The purpose of the build-out analysis is to determine potentially developable land areas for residential, commercial, and industrial development. The process starts with identifying development that already exists based on 1997 Mac Connell Land Use data and new subdivisions

built since that time. Already developed areas are subtracted from the town's total acreage and the remaining area is classified as undeveloped. Undeveloped areas are then screened for environmental constraints such as steep slopes in excess of 25 percent, wetland areas, Rivers Protection Act buffer areas, and Zone I Recharge areas to public water supplies. In addition, protected open space is removed from consideration, but only those areas that are permanently protected, such as farmland in the Agricultural Preservation Restriction Program. Interestingly, some areas which you would expect to be screened, such as those held by water districts to protect public water supplies, may not be if a conservation restriction or some other legal mechanism is not placed on the deed to permanently protect the land as open space. Slopes between 15 and 25 percent are considered a partial constraint, since certain types of land use typically do not occur on relatively steep slopes. For purposes of this build-out analysis, it was assumed that commercial and industrial development, and residential districts with small lot sizes would not occur on slopes of 15 and 25 percent. However, it was assumed that large lot residential zoning could occur on slopes of 15 and 25 percent given greater flexibility to grade and site structures. The areas that remain after the screening process are considered potentially developable.

The zoning district is then overlaid on to the potentially developable areas and a "build factor" is calculated. The build factor is calculated based upon the requirements of each zoning district in terms of minimum lot size, frontage, setbacks, parking required and maximum lot coverage permitted. Once calculated, the build factor is used to convert potentially developable acreage into either residential house lots, or commercial or industrial square footage depending on the zoning district. Once house lots are calculated, this can be translated into estimated population growth, miles of new roads, and additional water consumption and solid waste generation. Commercial and industrial square footage is calculated and its associated demand for water is estimated.

Table 3-10: Summary Build-out Statistics of New Development and Associated Impacts

Potentially Developable Land (acres)	8,336
Total Residential Lots	5,916
Total Residential Units	6,270
Comm./Ind. Buildable Floor Area (sq. ft.)	2,131,182
Residential Water Use (gallons per day) [2]	1,272,521
Comm./Ind. Water Use (gallons per day) [2]	159,839
Non-Recycled Solid Waste (tons/year) [3]	6,190
New Residents [4]	16,967
New Students [5]	3,208
New Residential Subdivision Roads (miles)	108

Notes:

1. All wetlands removed from potentially developable land;
   No development on slopes in excess of 25%;
   No development in Zone I Water Supply Protection Areas;
   No development in permanently protected open space; and,
   No development within 150-foot buffer of transmission lines.
2. Estimate from the Department of Housing & Community Development's Growth Impact Handbook
3. Statewide Average
4. 1990 Census; Population/Housing Units
5. MISER; 1997 School Children/Population

The results of the build-out analysis are often quite startling. Table 3-10 describes the results of the build-out in numerical terms. While it might take many decades to reach "build-out," it is quite clear that current zoning will not protect the community's rural character or natural resource base. Open Space and Master Planning can help to identify key resources to protect and the areas most suitable for development. Once completed, Open Space and Master Plans should be translated into zoning revisions and land protection programs in order to realize the balance desired by a community between natural resource protection and development.

Although Charlemont has zoning that contains measures that seek to protect natural landscapes, sprawl of roadside frontage lots is the current development pattern occurring today. This development pattern will diminish the differences between the village and rural areas of town. Charlemont's zoning encourages the development of homes on large lots. Even with slope and soil constraints, the build-out analysis estimates there is room for 6,270 new dwelling units in town. This could result in over 17,000 more people and 3,200 more school-aged children.

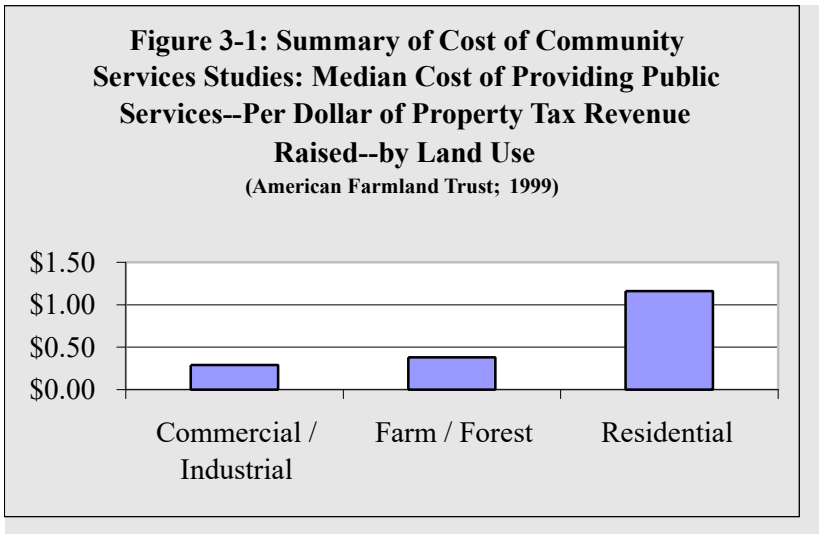
The analysis assumes that after all frontage lots are developed, backland will be developed as subdivisions. New subdivisions could result in the creation of more than 108 new miles of roads that would need to be maintained. Fire and police services would have to expand to protect the increased population. Before the last acre was developed, Charlemont would need community water supplies to satisfy an estimated additional daily water demand of 1.4 million gallons.

It is clear that this degree of population growth and development would result in ecological as well as economic impacts. The impacts could include a reduction in available clean drinking water, decreases in the quantity and quality of wildlife and fisheries habitat, a reduction in the water quality of streams, lower air quality, less biodiversity, increases in erosion and loss of open spaces. Full development would also result in the loss of agricultural businesses and rural character as well as a reduction in the viability of the town's recreation and tourism-based economy.

The economic impacts of this level of population growth and development would be felt well before maximum build-out was reached. The challenge for Charlemont and other communities is to find a model for growth that protects vital natural resource systems and maintains a stable property tax rate. In designing the model, it is important to understand the fiscal impact of different land uses, which can be calculated based on the relationship of property tax revenues generated to municipal services used.

Although protected open space typically has a low assessed value and thus generates low gross tax revenues, municipal expenditures required to support this use are typically much lower than the tax revenue generated. In 1991, the American Farmland Trust (AFT) conducted a Cost of Community Services (COCS) analysis for several towns in Franklin County. A COCS analysis is a process by which the fiscal impacts of different land uses within a town are compared to determine whether a use has a positive or negative net fiscal impact. The results of the 1991 AFT study showed that protection of open space is an effective strategy for promoting a stable tax base. It found that for every dollar generated by open space, the municipal services required by that land cost on average only 29 cents, resulting in a positive fiscal impact to the town. In 1995, the Southern New England Forest Consortium (SNEFC) commissioned a study of eleven southern New England towns that confirmed the findings of the earlier AFT study. These

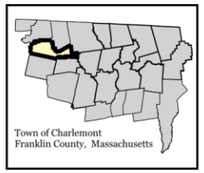
findings were confirmed by another 47 COCS analyses across the country conducted in the 1990s. Figure 3-1 demonstrates the summary of the 58 COCS studies. For every dollar of property tax revenues received from open space, the amount of money expended by the town to support farm and forest land is typically less than a dollar.



Source: American Farmland Trust; 1999.

The second component of a balanced land use plan concerns the development of other tax-generating land uses. Both the AFT and the SNEFC studies showed that for every dollar of taxes generated by commercial and industrial uses, the cost to towns for these uses resulted in a positive net gain. Patterns of commercial and industrial uses vary considerably between towns, and positive fiscal impact is only one of several important factors that need to be considered when encouraging this type of development. It is just as critical for communities to consider the impact of commercial and industrial development on quality of life. Viewed in this light, the best types of commercial and industrial development for Charlemont to encourage might have one or more of the following characteristics: Being a business in the recreation and tourism based services sector; locally owned and operated; use of a large amount of taxable personal property; a "green industry" that does not use or generate hazardous materials; businesses that add value to the region's agricultural and forestry products; and, businesses that employ local residents. It is also important to consider that successful commercial and industrial development often generates increased demand for housing, traffic congestion and pollution. Therefore, the type, size and location of industrial and commercial development require thorough research and planning.

By pursuing strategies that combine active land protection, zoning measures that direct development while protecting natural and historical resources, and sustainable economic development, Charlemont can continue to grow and stabilize its property tax rate while maintaining its historic villages and rural character.



FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
Main Office: 413-774-3167
425 Main Street
Greenfield, Massachusetts 01301

April 26, 2004

Legend

- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Water
- Wetland

Zoning

- Residential/Agricultural (RA)

Map Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

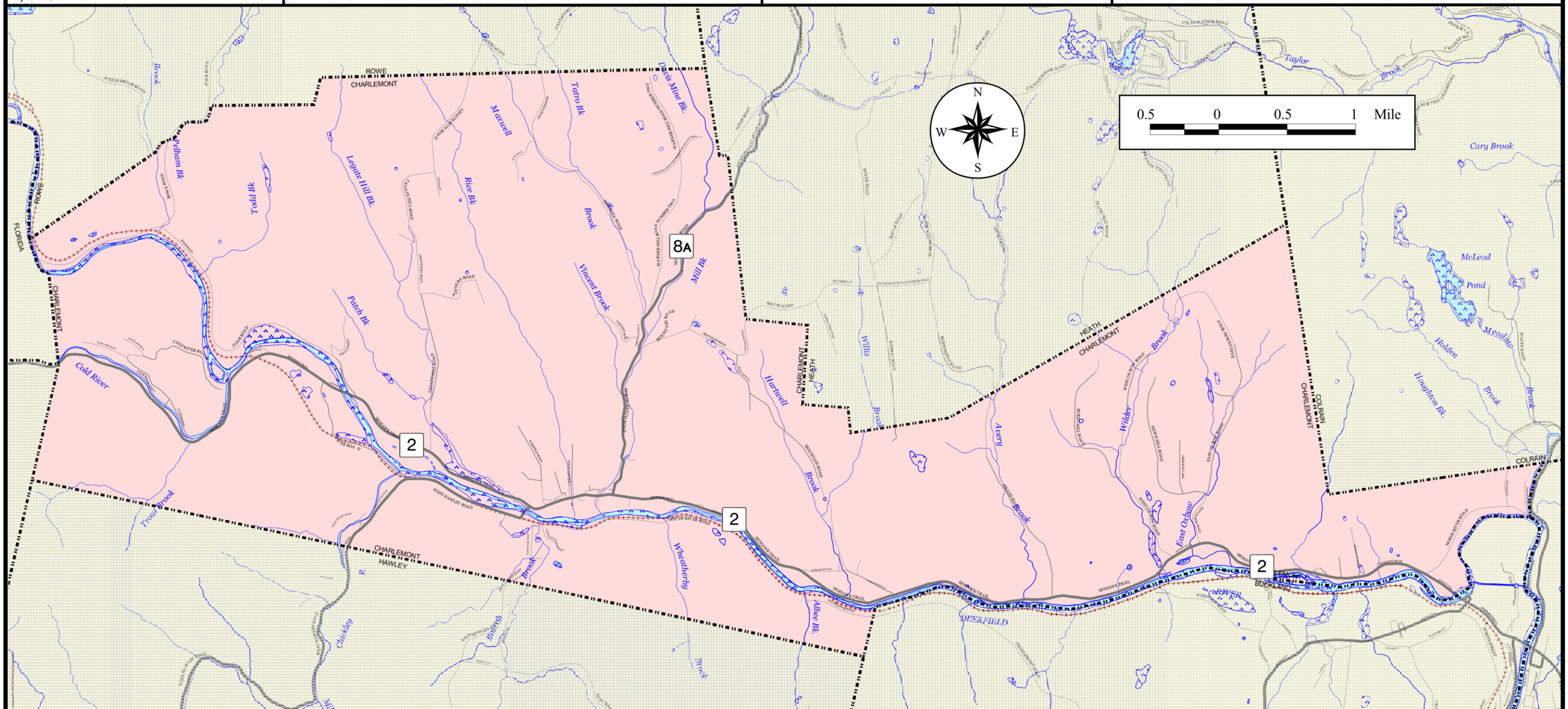
Road data provided by Massachusetts Highway Department.
Town line, rail line, river, stream, wetland, and lake data provided by MassGIS.
Zoning provided by FRCOG.

Note: Depicted boundaries are approximate and are intended for planning purposes only.
Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.

Town of Charlemont

Open Space and Recreation Plan

Zoning



Legend

- Town line
- Rail lines
- Roads
- Streams and rivers
- Transmission lines
- Water body
- National Wetland Inventory wetland
- Potentially developable, has no absolute constraints

Potential constraints for development

- Slope 15-25%
- Prime farmland soil
- Interim wellhead protection areas
- Estimated Habitats of Rare Wildlife (NHESP)
- Priority Habitats of Rare Species (NHESP)
- NHESP BioMap Core Habitat

Developed land (1999)

- Residential
- Commercial
- Industrial
- Urban open
- Transportation

Map Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

Road data provided by Massachusetts Highway Department. Town line, rail line, transmission line, river, stream, pond, National Wetlands Inventory, slope, soil, interim wellhead protection area, aquifer, land use, NHESP, and outstanding water resource data provided by MassGIS. Prime farmland soils digitized by FRCOG staff.

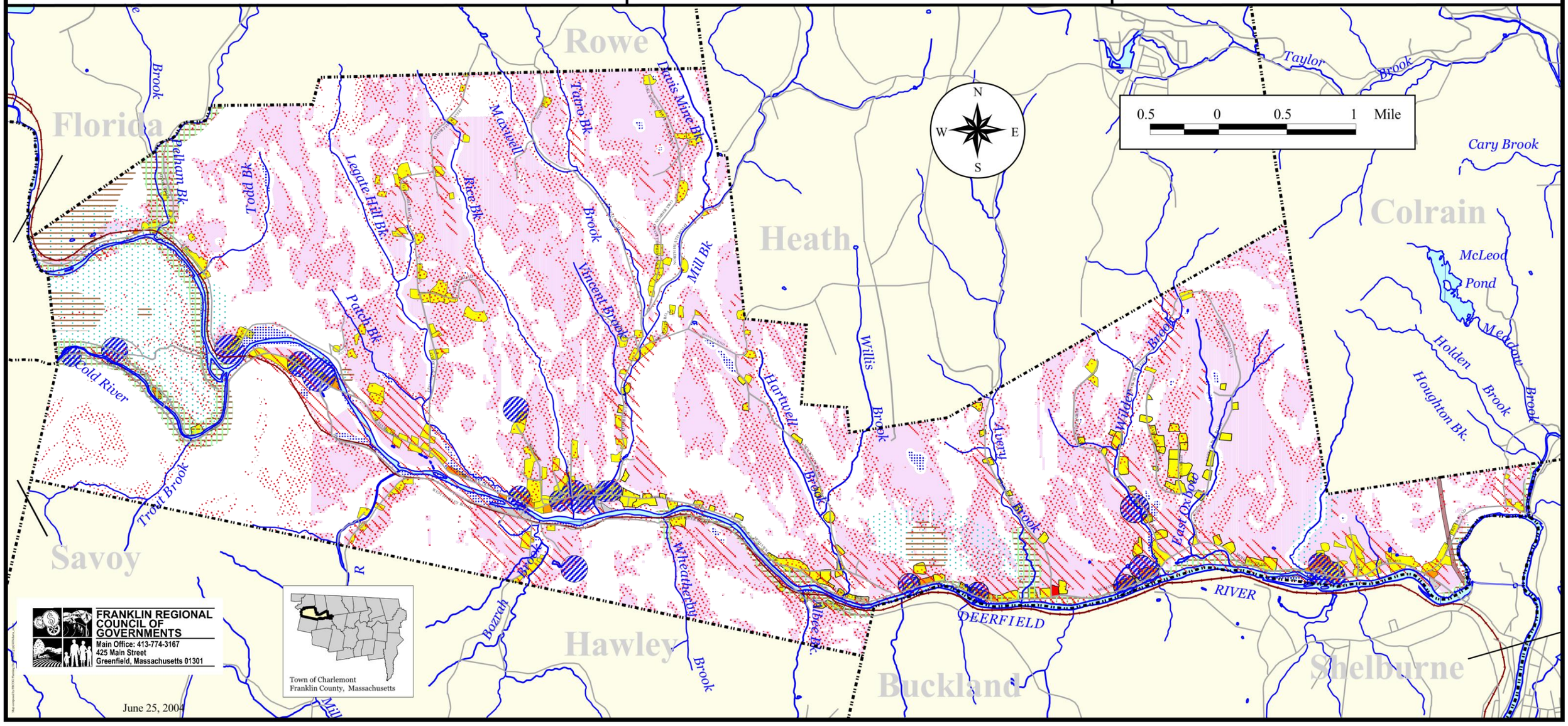
NHESP 2003 Estimated Habitats of Rare Wildlife: For use with the Massachusetts Wetlands Protection Act regulations (310CMR 10).
NHESP 2003 Priority Habitats for State-protected Rare Speicies: NOT equivalent to 'Significant Habitat' as designated under Massachusetts Endangered Species Act.
NHESP BioMap Core Habitat.

Note: Depicted boundaries are a approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.

Town of Charlemont

Open Space and Recreation Plan

Land Use Suitability



FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
Main Office: 413-774-3167
425 Main Street
Greenfield, Massachusetts 01301

Town of Charlemont
Franklin County, Massachusetts

June 25, 2004

SECTION 4

ENVIRONMENTAL INVENTORY AND ANALYSIS

The scenic landscape of the Town of Charlemont has been cherished by its residents for generations. This Open Space and Recreation Plan is intended to help residents protect the town's scenic value and natural resources in the face of increased development pressure, while recognizing that people need places to live, learn, work and play. These needs require infrastructure: homes, roads, power, water, wastewater systems, etc. Infrastructure, in turn, both depends upon and impacts critical natural systems like the water cycle. One way to understand the impact of development on natural resources is to study the *ecosystems* of the town and the region.

An ecosystem is a concept that describes how a group of living organisms (plants, animals and microorganisms) interacts with each other and their physical environment (soil, climate, water, air, light, etc.). Ecosystems exist at different scales. A large forest can be an ecosystem and so can a decayed tree trunk. The integrity of ecosystems depends on the relationship between living beings and their environment. Wetlands, for example, are ecosystems consisting of plants and animals that depend on water from the surface and the ground. Wetland vegetation grows where soils are saturated by water for at least several weeks a year. This vegetation provides shade, food and habitat for a wide variety of insects, birds and fish.

Ecosystems provide a variety of "services" that are very important to human communities. Wetlands, for example, trap and remove sediments, nutrients and toxic substances from surface water. They store floodwaters during and after storms, preventing damage to public and private property, and recharge water to the ground, and retain it during droughts. These functions are vulnerable to the impacts of land development. Construction in and around wetlands not only displaces the animals that depend on this ecosystem, it may also result in increased flooding, storm damage, and reduction in the quality and quantity of drinking water.

The information provided in this section explores the biological and physical components of the town's ecosystems. These components include air, surface and ground water, soils, vegetation, fisheries and wildlife. *Topography, Geology, and Soils* provides a general understanding of the ways different soil characteristics can impact land use values. *Landscape Character* provides an overall scenic context. *Water Resources* describes all of the water bodies in town, above and below ground, including their recreational value, public access, and any current or potential quality or quantity issues. Charlemont's forest, farmland and wetland vegetation types are documented including rare, threatened, and endangered species. In *Fisheries and Wildlife*, wildlife, habitat, special corridors, and rare, threatened, and endangered species are discussed. Charlemont's *Scenic Resources and Unique Environments* are identified and described. Finally, *Environmental Challenges* addresses current and potential problems that may influence open space or recreation planning.

A. TOPOGRAPHY, GEOLOGY, AND SOILS

Decisions about land use must take into consideration the inherent suitability of a site for different kinds of development. Geology, soils, and topography are essential to determining potential sites for future residential, commercial and industrial development and for new parks, hiking trails and open space.

A.1 Topography

The topography of the Town of Charlemont consists of steep and rolling hills, open fields, numerous streams and the "crown jewel", the Deerfield River, which flows the entire length of the town. The Deerfield River enters the Town of Charlemont in the northwestern corner of the town and flows southeastward to its eventual confluence with the Connecticut River in the Town of Deerfield. The steep and rolling hills of Charlemont lie on both sides of the Deerfield River, with the highest elevations in the southwestern and northeastern corners of town. The town's highest point is Pocumtuck Mountain, at 1,872 feet, located in the northeastern corner. Within much of Charlemont, the Deerfield River Valley is fairly broad and flat and encompasses a significant portion of the town's prime agricultural land.

A.2 Geology

The Town of Charlemont as we know it today is the result of millions of years of geologic history: great upheavals of the earth's crust and volcanics, and the sculpting power of moving water, ice and wind. This distinctive physical base has determined the distribution of the town's water bodies, its soils and vegetation and its settlement patterns, both prior to and since colonial times. Understanding Charlemont's current landscape requires a brief journey back in time and a review of some basic geological concepts.

The earth's crust is a system of plates whose movements and collisions shape the surface. As the plates collide, the earth's crust is compressed and forced upward to form great mountain ranges. In the northeastern United States, the plates move in an east-west direction, thus the mountains formed by their collisions run north to south.

The pressure of mountain building folded the earth, created faults, and produced the layers of metamorphosed rock typically found in New England. Collision stress also melted large areas of rock, which cooled and hardened into the granites that are found in some of the hill towns in Massachusetts today. Preceding the collisions, lines of volcanoes sometimes formed, and Franklin County shows evidence of this in bands of dark rock schist metamorphosed from lava flows and volcanic ash.

Hundreds of millions of years ago, a great continent, known as Pangaea, formed through the collisions of plates. Pangaea began to break apart almost 200 million years ago, and continues to

do so as the continents drift away from each other today. This "continental drift" caused earthquakes and formed large rift valleys, the largest of which became the Atlantic Ocean. The Connecticut Valley was one of many smaller rifts to develop. Streams flowing into the river from higher areas to the east brought alluvium, including gravels, sand and silt. At the time, the area that is now the Town of Charlemont was located south of the equator. The Dinosaur era had begun, and the footprints of these giant reptiles are still visible in the rock formed from sediments deposited on the valley floor millions of years ago.

By the close of the Dinosaur age, the entire eastern United States including Charlemont was part of a large featureless plain, known as the peneplain. It had been leveled through erosion, with the exception of a few higher, resistant areas. Today, these granite mountaintops, called monadnocks, are still the high points in this region. Local examples include Mt. Wachusett, Mt. Greylock, and Mt. Monadnock in New Hampshire.

As the peneplain eroded, the less resistant rock eroded to form low-lying areas, while bands of schist remained to form upland ridges. By this time, the Connecticut Valley had been filled with sediment, while streams that would become the Deerfield, Westfield and Farmington Rivers continued to meander eastward. The westward-flowing streams would become more significant later on.

A long period of relative quiet in geologic terms followed the Dinosaur era. Then, as the Rocky Mountains were forming in the west eight million years ago, the eastern peneplain shifted upward a thousand feet. As a result of the new, steeper topography, stream flow accelerated, carving deep valleys into the plain. Today, the visible remnants of the peneplain are the area's schist-bearing hilltops, all at about the same 1,000-foot elevation.

Mountain building, flowing water, and wind had roughly shaped the land; now the great glacial advances would shape the remaining peneplain into its current topography. Approximately two million years ago, accumulated snow and ice in glaciers to the far north began advancing under their own weight. A series of glaciations or "ice ages" followed, eroding mountains and displacing huge amounts of rock and sediment. The final advance, known as the Wisconsin Glacial Period, completely covered New England before it began to recede about 13,000 years ago. This last glacier scoured and polished the land into its final form, leaving layers of debris and landforms that are still distinguishable.

The glacier picked up, mixed, disintegrated, transported and deposited material in its retreat. Material deposited by the ice is known as *glacial till*. Material transported by water, separated by size and deposited in layers is called *stratified drift.* (Natural Resource Inventory for Franklin County, University of Massachusetts Cooperative Extension; May 1976) The glacier left gravel and sand deposits in the lowlands and along stream terraces. Where deposits were left along hillsides, they formed kame terraces and eskers. Kames are short hills, ridges, or mounds of stratified drift, and eskers are long narrow ridges or mounds of sand, gravel, and boulders.

A.3 Soils

Soil is the layer of minerals and organic material that covers the rock of the earth's crust. All soils have characteristics that make them more or less appropriate for different land uses. Scientists classify soils by these characteristics, including topography; physical properties including soil structure, particle size, stoniness and depth of bedrock; drainage or permeability to water, depth to the water table and susceptibility to flooding; behavior or engineering properties, and biological characteristics such as presence of organic matter and fertility (Natural Resource Inventory for Franklin County, University of Massachusetts Cooperative Extension; May 1976). Soils are classified and grouped into associations that are commonly found together.

As Charlemont plans for the long-term use of its land, residents should ask: 1) Which soils constrain development given current technologies? 2) Which soils are particularly suited for recreational opportunities and wildlife habitat? and 3) Which soils are best for agriculture? The answers to these questions can help lay a foundation for open space and recreation planning in Charlemont. The following sub-section provides a description of the soils in Charlemont based on their impact on agriculture, drinking water issues, wastewater issues, recreation opportunities, erosion and wildlife habitat.

Which soils constrain development given current technologies?

Soils in Charlemont found on the moderate to steep slopes are of the Lyman, Westminster and Colrain series. The Westminster and Lyman soils are found on the moderate to steep slopes in town. They are extremely rocky and are well to excessively drained. They develop in thin deposits of glacial till over bedrock. Due to their shallowness, they are droughty. Depth to bedrock is generally less than twenty inches, but can be at a depth of three feet in some places. The Colrain soils can be found in nearly level to very steep slopes, but are limited in use due to their extreme stoniness. They are moderately to well drained soils that are found in loose to compact glacial till. The Colrain soils have a moderate to high moisture holding capacity. Other soils that constrain development are those that are either shallow or wet. Both wet and shallow soils do not provide for adequate filtration of wastewater pollutants associated with private septic systems. Shallow soils are often associated with steep slopes or hilltops while wet soils are often found along floodplains and wetland systems.

Which soils are particularly suited for recreational opportunities and wildlife habitat?

Outside of flat areas for sports fields, the soils best suited for rural recreational purposes are the same as those that provide upland wildlife habitat. Different recreational uses are constrained by different soil and topographical characteristics. Sports fields require well-drained soils and level topography, whereas lands with slopes greater than 25 percent are attractive to mountain biking and hiking enthusiasts. The level topography of the Deerfield River Valley makes it well suited for walking, birding and mountain biking, as well as appealing to all-terrain vehicles and snowmobiles, however, the soils in the Valley are also considered prime farmland soils.

Erodability of soils has important implications for the impact of recreational uses. Erodable soils include those that are shallow, wet, sandy, or sloped, or those with a combination of these characteristics. Hikers, mountain bikers and ATVs can create and exacerbate erosion on steep slopes and in sandy soils.

In other areas of town, there is a good correlation between soils that support wildlife habitat and soils that present the most constraints to development. These soils include the extremely rocky loam type soils of the Westminster, Lyman, and Colrain series found on the moderate to steep slopes in the town.

Which are the best soils for agriculture?

The Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service of the U.S. Department of Agriculture is responsible for classification of soils according to their suitability for agriculture. NRCS maintains detailed information on soils and maps of where they are located.

NRCS defines prime farmland as the land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops and that is available for these uses (USDA, NRCS, National Soil Survey Handbook; 2001). Prime soils produce the highest yields with the fewest inputs, and farming in these areas results in the least damage to the environment. Unique farmland is land other than prime farmland used for the production of high-value food and fiber crops. Unique farmland has a special combination of soil quality, location, growing season and moisture supply. These agricultural soils are a finite resource. If the soil is removed, or the land is converted to another use, the capacity for food and fiber production is lost.

Prime farmland soils have contributed to the town's economic stability throughout its history. According to the Charlemont Master Plan Background Document, 14 percent of total land area in Charlemont is Prime Farmland, including other Farmland of Statewide importance. The more common soils that constitute these prime agricultural lands include those of the Agawam, Merrimac, and Suncook series (Charlemont Master Plan; 1998). Prime farmland soils are primarily located within the Deerfield River floodplain and along Avery Brook, Wilder Brook, the Chickley River, the lower portion of Mill Brook from Mountain Road south, Legate Hill Road and Potters Road (USDA; 1979).

The characteristics that make prime farmland soils suitable for agricultural also make them easy to develop. Large tracts of level, well-drained farmland are attractive to developers because the cost of installing roads and other infrastructure is relatively low. Residents interested in conserving these lands can consider all farmland soils to be rare, valuable, and vulnerable to development.

B. LANDSCAPE CHARACTER

The diverse landscape character of the Town of Charlemont distinguishes it from surrounding communities. The town is one of steep forested hills, agricultural lands, numerous streams, and abundant wildlife. The Deerfield River, a focal point within Charlemont, flows southeastward along the entire length of the town. Many of the town's agricultural lands can be found within the Deerfield River floodplain as well as within the floodplains of its many tributaries. The town's villages, including Charlemont Village, are also located along the Deerfield River.

C. WATER RESOURCES

C.1 Watersheds

Charlemont is rich in water resources, including brooks, streams, vernal pools, wetlands, and aquifers *(See the Water Resources Map)*. As described in Section 3, all the land in town drains into the Deerfield River, which is an important sub-watershed within the Connecticut River Watershed. Information on water quality in the main stem of the Connecticut River within Massachusetts and the Deerfield River is presented in Section 3. This section focuses on waters within the Town of Charlemont, but it is important to keep in mind that improvements in water quality in the Deerfield River and the other brooks and streams in town have impacts beyond town borders.

Deerfield River (sub-watershed of the Connecticut)

The Deerfield River Watershed is a sub-watershed of the Connecticut River Watershed that drains approximately 665 square miles of the Southern Green Mountains in Vermont and the Northern Berkshires in Massachusetts. Three hundred and forty-seven square miles of this land is located in all or part of twenty western Massachusetts towns. From its headwaters at Stratton Mountain in Vermont, the Deerfield River flows southeastward for approximately seventy (70.2) miles through the steep terrain of the Berkshires to its confluence with the Connecticut River.

The northern portion of the watershed from Somerset to Route 2 in Massachusetts is primarily forested and steep, accounting for approximately 78 percent of the total watershed area. Much of the land along the remaining length of the river is open and agricultural land.

The Deerfield River drops 1,000 ft. in elevation along its length in Massachusetts. This feature has resulted in the management of the Deerfield River for hydroelectric power generation with ten hydroelectric developments constructed on the river since 1911.

Despite the River's regulation by hydroelectric facilities, the Deerfield River's cold and clean waters makes it one of the best fisheries in the State. As part of the Connecticut River restoration project, the Massachusetts Division of Fisheries and Wildlife (DFW) is responsible for the Atlantic salmon restoration effort. The stocking program releases Atlantic salmon fry into tributaries of the Connecticut River. The Deerfield River Watershed (in twenty-one tributaries) is stocked with 700,000 Atlantic salmon fry each spring (Slater; 2001). The River also supports native and stocked trout, making the Deerfield River one of the premier rivers for fishing in the New England.

Recreational opportunities within and along the Deerfield River abound. Whitewater sports, hiking, biking, hunting, fishing, cross-country skiing, and snowshoeing are some of the activities enjoyed by residents and visitors alike.
According to the Mass. Department of Environmental Protection, the Deerfield River from the Vermont-Massachusetts State Line to its confluence with the Connecticut River is given a Class B water quality designation. Given a Class B designation, a water body is considered suitable

habitat for fish, other aquatic life and wildlife. It is also safe for primary and secondary contact recreation and has overall consistent aesthetic quality.

The Deerfield River, from the confluence of the Cold River in the Town of Charlemont to its confluence with the North River at the Charlemont/Shelburne Falls line is one of the water bodies in the state that the Massachusetts Department of Environmental Protection (DEP) has placed on its Section 303(d) List of Waters (Segments Needing Confirmation List). A report of the DEP, Final Massachusetts Section 303(d) List of Waters, 1998, states that the "Section 303(d) of the Federal Clean Water Act requires states to identify those water bodies that are not expected to meet surface water quality standards after the implementation of technology –based controls and, as such, require the development of total maximum daily loads (TMDL)." A TMDL is the greatest amount of a pollutant that a water body can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. TMDL's also describe a report prepared by DEP for each impaired water body that identifies the steps and technologies needed to reduce the pollutant or source of impairment to meet water quality standards. The TMDL reports reflect DEP's strategy for cleanup of all of the water bodies in Massachusetts.

The Deerfield River Watershed Association (DRWA) has been monitoring the Deerfield River and several of its tributaries in Massachusetts for water quality since 1990. The results of its 2002 Volunteer Monitoring Program note that the alkalinity levels in the watershed are low which can stress the native trout fishery. Dissolved oxygen levels have been historically high and were found to continue to be so. After five years of collecting bacteria data, the DRWA has concluded that dry spells in the watershed do not pose a bacterial threat to the Deerfield River and the tributaries it monitors and thus, these waters are safe for contact recreation during times of drought. Conversely, it was found that runoff, as a result of storms, does pose a bacterial threat at several of the monitored sites, making them unsafe for swimming at those times.

Surface Water Resources in the Deerfield River Watershed

Flowing into the Deerfield River from the north side of the River are the following:

Pelham Brook

Pelham Brook originates at Pelham Lake in the Town of Rowe. It joins the Deerfield River in Zoar Village at the intersection of Zoar and Rowe Roads.

Todd Brook

Todd Brook originates near the top of Coon Hill and flows to its confluence with the Deerfield River near the Zoar Village cemetery.

Patch Brook
Patch Brook is a tributary of Legate Brook, which originates in the uplands below Blueberry Peak.

Legate Brook
Legate Brook originates in The Basin and flows southeasterly to its confluence with the Deerfield River in Charlemont Village.

Rice Brook
Rice Brook originates in the uplands west of Tatro Road just across the town line in the Town of Rowe. It converges with the Deerfield River in Charlemont Village.

Vincent Brook
Vincent Brook is a tributary of Mill Brook. It originates in the uplands east of Riddell Road and flows southeasterly to join Mill Brook approximately one half mile north of the Bissell Bridge on Route 8A.

Maxwell Brook
Maxwell Brook originates in the uplands of the Town of Rowe north of Tatro Road. It flows southeast to join Mill Brook just southeast of the intersection of Warner Hill Road and Route 8A.

Tatro Brook
Tatro Brook is a tributary of Maxwell Brook. It originates in the uplands of the Town of Rowe near the town line.

Davis Mine Brook
Davis Mine Brook is a tributary of Mill Brook originating in an area of wetlands south of the intersection of Cyrus Stage Road and Dell Road in the Town of Rowe. Davis Mine Brook is listed on the Massachusetts Section 303 (d) List of Impaired Waters (Segments Needing Confirmation List), for pH and habitat alteration.

Mill Brook
Mill Brook originates in the uplands of the Town of Heath. It flows southwesterly along Route 8A and is joined by Maxwell and Davis Mine Brooks before it converges with the Deerfield River in Charlemont Village.

Hartwell Brook
Hartwell Brook originates in the Town of Heath and flows along either side of Mountain Road. It enters the Deerfield River in East Charlemont near the Leavitt Cemetery.

Willis Brook
Willis Brook is a tributary of Hartwell Brook. It originates in the Town of Heath, west of South Cemetery.

Avery Brook
Avery Brook originates in the Town of Heath in the uplands just south of the village of Heath. It flows southeasterly to its confluence with the Deerfield River near Heath Road.

Wilder Brook
Wilder Brook originates in the uplands east of Burnt Hill in the Town of Heath. As it enters the Town of Charlemont it follows West Oxbow Road in East Charlemont to its confluence with the Deerfield River across from the intersection of West Oxbow Road and Route 2.

East Oxbow Brook
East Oxbow Brook originates along the southeast side of Pocumtuck Mountain and flows into the Deerfield River in East Charlemont.

Flowing into the Deerfield River from the south side of the River are the following:

Albee Brook
Albee Brook originates in an area of wetlands west of Dodge Corner in the Town of Hawley. It flows northward to its confluence with the Deerfield River in the central section of Charlemont.

Wheatherby Brook
Wheatherby Brook originates in the uplands of northeastern Hawley, to the east of Mount Institute. If flows northward to its confluence with the Deerfield River near Charlemont Center.

Bozrah Brook
Bozrah Brook drains an area of wetlands located west of East Hawley Road in the Town of Hawley. The Brook flows northward to its confluence with the Deerfield River, across from Charlemont Center.

Chickley River
The Chickley River originates in Savoy State Forest in the Town of Savoy in Berkshire County. It flows eastward, then northward to its confluence with the Deerfield River, near Route 8A on the southern shore of the River. The Chickley River, from its confluence with Tilton and Horsefords Brooks in Savoy to the River's confluence with the Deerfield River, is on the 1998 Massachusetts Section 303 (d) List of Impaired Waters (Segments Needing Confirmation List), for pathogens.

Cold River
The Cold River originates in the Hoosac Range in the Town of Florida. It flows southeastward. For a portion of its length, the Cold River runs through Mohawk Trail State Forest, where it is enjoyed for swimming and whitewater boating, in season. The Cold River's confluence with the Deerfield River is also located in Mohawk Trail State Forest in the southwestern section of town.

Trout Brook
The headwaters of Trout Brook are located on Hawks Mountain in Mohawk Trail State Forest in the Town of Hawley. It is a tributary of the Cold River and is located in the southwestern corner of the town.

C.2 Flood Hazard Areas

Flooding along rivers is a natural occurrence. Floods happen when the flow in the river exceeds the carrying capacity of the channel. Some areas along rivers flood every year during the spring, other areas flood during years when spring runoff is especially high, or following severe storm events. The term "floodplain" refers to the land affected by flooding from a storm predicted to occur at a particular interval. For example, the "one hundred year floodplain," is the area predicted to flood as the result of a very severe storm that has a one percent chance of occurring in any given year. Similarly, the 500-year floodplain is the area predicted to flood in a catastrophic storm with a 1 in 500 chance of occurring in any year.

The 100- and 500-year floodplains are mapped by the National Flood Insurance Program (NFIP) after study of waterways. The 100-year floodplain is used for regulatory purposes. According to the NFIP maps effective 1980, one hundred year flood plains in Charlemont occur along:

- The entire length of the Deerfield River in Charlemont;
- Pelham Brook from its confluence with the Deerfield River north approximately 500 ft.;
- Legate Brook from its confluence with the Deerfield River to its confluence with Patch Brook;
- Mill Brook from its confluence with the Deerfield River north to approx. 0.4 miles past the intersection of North Heath Road and Warner Road;
- Bozrah Brook;
- The Chickley River from its confluence with the Deerfield River to a point approximately 1,500 ft. upstream; and
- Along the Cold River.

C.3 Wetlands

Wetlands are transitional areas where land-based and water-based ecosystems overlap. Inland wetlands are commonly referred to as swamps, marshes and bogs. Technically, wetlands are places where the water table is at or near the surface or the land is covered by shallow water. Sometimes, the term "wetlands" is used to refer to surface water as well.

Historically, wetlands have been viewed as unproductive wastelands, to be drained, filled and "improved" for more productive uses. Over the past several decades, scientists have recognized that wetlands perform a variety of extremely important ecological functions. They absorb runoff and prevent flooding. Wetland vegetation stabilizes stream banks, preventing erosion, and trap sediments that are transported by runoff. Wetland plants absorb nutrients, such as nitrogen and phosphorus, which would be harmful if they entered lakes, ponds, rivers and streams. They also absorb heavy metals and other pollution. Finally, wetlands are extremely productive, providing food and habitat for fish and wildlife. Many plants, invertebrates, amphibians, reptiles and fish depend on wetlands to survive. Wetlands have economic significance related to their ecological functions: it is far more cost-effective to maintain wetlands than build treatment facilities to manage stormwater and purify drinking water, and wetlands are essential to supporting lucrative outdoor recreation industries including hunting, fishing and bird-watching.

In recognition of the ecological and economic importance of wetlands, the Massachusetts Wetlands Protection Act is designed to protect eight "interests" related to their function: public and private water supply, ground water supply, flood control, storm damage prevention, prevention of pollution, land containing shellfish, fisheries, and wildlife habitat. To this end, the law defines and protects "wetland resource areas," including banks of rivers, lakes, ponds and streams, wetlands bordering the banks, land under rivers, lakes and ponds, land subject to flooding, and "riverfront areas" within two hundred feet of any stream that runs all year. Local Conservation Commissions are responsible for administering the Wetlands Protection Act; some towns also have their own, local wetlands regulations.

Many of Charlemont's wetlands can be found in its forested upland areas. Some of these wetlands are mapped by the National Wetlands Inventory (NWI) (*See Water Resources Map*).

Vernal Pools

Vernal pools are temporary bodies of fresh water that provide critical breeding habitat for many vertebrate and invertebrate wildlife species. They are defined as "basin depressions where water is confined and persists for at least two months during the spring and early summer of most years, and where reproducing populations of fish do not survive". Vernal pools may be very shallow, holding only 5 or 6 inches of water, or they may be quite deep. They range in size from fewer than 100 square feet to several acres (Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, *Massachusetts Aerial Photo Survey of Potential Vernal Pools;* Spring 2001). Vernal pools are found across the landscape, anywhere that small woodland depressions, swales or kettle holes collect spring runoff or intercept seasonal high groundwater, and along rivers in the floodplain. Many species of amphibians and vertebrates are completely dependent on vernal pools to reproduce. Loss of vernal pools can endanger entire populations of these species.

The state's Natural Heritage and Endangered Species Program (NHESP) has predicted the location of vernal pools statewide based on interpretation of aerial photographs. NHESP believes that its method correctly predicts the existence of vernal pools in 80 to 90 percent of cases. They acknowledge, however, that the method probably misses smaller pools. In Charlemont, NHESP has identified thirty-two potential vernal pools.

In addition to identifying potential vernal pools, NHESP certifies the existence of actual vernal pools when evidence is submitted to document their location and the presence of breeding amphibians that depend on vernal pools to survive. Certified vernal pools are protected by the Massachusetts Wetlands Protection Act and by additional state and federal regulations.

Vernal pools are magical places in early spring. They are easiest to find by listening for the mating choruses of frogs and toads. The pools teem with life, and are wonderful places to teach children about the natural world. The town should continue its efforts to identify vernal pools, provide landowners with information on their ecological importance, and encourage certification to protect these unique ecosystems.

C.4 Potential Aquifers and Recharge Areas

Aquifers are composed of water-bearing soil and minerals, which may be either unconsolidated (soil-like) deposits or consolidated rocks. Consolidated rocks, also known as bedrock, consist of rock and mineral particles that have been welded together by heat and pressure or chemical reaction. Water flows through fractures, pores and other openings. Unconsolidated deposits consist of material from the disintegrated consolidated rocks. Water flows through openings between particles.

As water travels through the cracks and openings in rock and soil, it passes through a region called the "unsaturated zone," which is characterized by the presence of both air and water in the spaces between soil particles. Water in this zone cannot be pumped. Below this layer, water fills all spaces in the "saturated zone." The water in this layer is referred to as "groundwater." The upper surface of the groundwater is called the "water table" (Masters, Gilbert. *Introduction to Environmental Engineering and Science, Second Edition*; 1998).

The route groundwater takes and the rate at which it moves through an aquifer is determined by the properties of the aquifer materials and the aquifer's width and depth. This information helps determine how best to extract the water for use, as well as determining how contaminants, which originate on the surface, will flow in the aquifer.

Aquifers are generally classified as either unconfined or confined (EPA and Purdue U.; 1998). The top of an unconfined aquifer is identified by the water table. Above the water table, in the unsaturated zone, interconnected pore spaces are open to the atmosphere. Precipitation recharges the groundwater by soaking into the ground and percolating down to the water table. Confined aquifers are sandwiched between two impermeable layers (Masters; 1998). Almost all the public wells in Massachusetts and many private wells tap unconfined aquifers (Mass. Audubon Society; 1985). Wells that rely on confined aquifers are referred to as "artesian wells."

According to MassGIS and US Geological Service (USGS) documents, Charlemont contains a high-yield aquifer, defined as an aquifer with the potential to provide a pumping volume 50 to 200 gallons per minute. In Charlemont, this aquifer is located along the Deerfield River approximately from Todd Brook to the Chickley River *(See Water Resources Map)*.

Charlemont's surficial geology has characteristics that would support low to medium yield aquifers as well. A low-yield aquifer provides a yield of between 0 and 50 gallons per minute. According to MassGIS and the USGS, these low to medium yield aquifers are located along:

- The Deerfield River;
- Pelham Brook;
- The lower portion of Legate Brook;
- The lower portion of Maxwell Brook;
- Mill Brook;
- Mountain Road between Route 8A and Hartwell Brook;
- Avery Brook;
- Wilder Brook;
- Bozrah Brook;

- Chickley River; and • The Cold River.

D. VEGETATION

Plants are a critical component of ecosystems in Charlemont. Plants convert solar energy into food, which supports all animal life. Plants cycle energy through the ecosystem by decaying, by removing carbon from the atmosphere and by shedding oxygen. Plants help moderate temperatures and act as shelter and feeding surfaces for herbivores, omnivores, and carnivores.

Plants and animals together make up *natural communities*, defined as interacting groups of plants and animals that share a common environment and occur together in different places on the landscape (NHESP; 2001). Over the past decade, ecologists and conservationists in Massachusetts have devoted increasing effort to studying and protecting these natural communities, rather than focusing on individual species. This section and the following section will address both natural communities and their component species.

Forests make up 83 percent of Charlemont's total land area and are one of the town's most important natural resources. The town's forests include Northern hardwoods and conifers, as well as floodplain forests. This section describes vegetated areas in town with ecological and economic significance.

D.1 Forests

Northern Hardwoods Forest

Charlemont is located in the Northern Hardwoods Forest Region (DeGraaf, R.M et. al; 1992). This forest type commonly occurs up to an elevation of 2,500 ft. above sea level and prefers fertile, loamy soils and good moisture conditions. In New England, the Northern Hardwoods can be found in Massachusetts in the glacial till soils west of the Connecticut River and in small portions of Maine and Connecticut, as well as most of the forested areas in New Hampshire and Vermont. The predominant species of the Northern Hardwoods are American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis)* and sugar maple (*Acer saccharum*). Associated species include red maple (*Acer rubrum*), white ash (*Fraxinus americana*), eastern hemlock (*Tsuga canadensis*), paper birch (*Betula papyrifera*), quaking and big tooth aspen (*Populus tremuloide*s and *P. grandidentata*), eastern white pine (*Pinus strobes*), red spruce (*Picea rubens*) and red oak (*Quercus rubra*).

Northern Hardwood – Hemlock – White Pine Forest

According to the Massachusetts Natural Heritage and Endangered Species Program, the Town of Charlemont is home to old growth Northern Hardwoods-Hemlock-White Pine forests, a good example of which is located in the Mohawk Trail State Forest (NHESP; 2002). The Northern Hardwoods-Hemlock-White Pine forest is a variant of the Northern Hardwood Forest which

occurs in dry to moderately moist and acidic conditions on north facing slopes and ravines. This community varies from pure stands of hemlock to deciduous forests scattered with hemlocks. Various combinations of hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), black cherry (*Prunus serotina*), red oak (*Quercus rubra*), and white pine (*Pinus strobus*). Scattered throughout this forest type one can also find paper birch (*Betula papyrifera*), aspen (*Populus tremuloides*), red maple (*Acer rubrum*), and yellow birch (*Betula alleghaniensis*).

High-Terrace Floodplain Forest

The high-terrace floodplain forests can also be found in Charlemont. Typically, they occur on raised banks adjacent to rivers and streams, on steep banks along high gradient rivers particularly in western Massachusetts, on high alluvial terraces and on raised areas within major-river and small-river floodplain forests. The high-terrace floodplain forest is not subjected to annual spring flooding as it is above the flood zone.

The high-terrace floodplain forest in Massachusetts has a mixture of hardwoods generally associated with floodplains. These include red and silver maple (*Acer rubrum* and *saccharinum*) as well as sugar maple (*Acer saccharum*), shagbark hickory (*Carya ovata*), black cherry (*Prunus serotina*), American elm (*Ulmus americana*), and basswood (*Tilia americana*). Ironwood (*Carpionus caroliniana*) is present in the sub-canopy and is a good indicator of this community. Within the shrub layer one can find arrowwood (*Viburnum dentatum*), nannyberry (*Viburnum lentago*) and winterberry (*Ilex verticillata*). The herbaceous layer is a mixture of forest ferns and upland herbs characteristic of floodplain forests.

D.2 Unusual Natural Communities

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife has noted the Town of Charlemont as having a number of uncommon ecologically significant natural communities within its borders, which support a number of the state-listed rare and endangered species (NHESP correspondence; 2002). These communities include:

Rich, Mesic Forests

Rich, mesic forests are one type of unusual natural community known to occur in the Town of Charlemont. The rich, mesic forest is nutrient-*rich*, moderately moist (*mesic*) variant of the Northern Hardwood forest. It is found in areas of calcium-rich bedrock and alkaline groundwater. In the Northeast, these forests occur at low to moderate elevations below 2,400 feet and usually on the north or east-facing, concave, middle to lower slopes. Within the Commonwealth of Massachusetts only a limited number of rich, mesic forests can be found. Sugar maple (*Acer saccharum*) and/or basswood (*Tilia americana*) are the dominant species of this forest. White ash (*Fraxinus americana*), yellow birch (*Betula alleghaniensis*), butternuthickory (*Carya cordiformis*), and sweet birch (*B. lenta*) also occur in small numbers.

Rocky Summit/Rock Outcrop Community

The Rocky Summit/Rock Outcrop community is found on the rocky summits of hills and mountains where bedrock is exposed or on rock outcrops of upper to mid-slope areas. Most of these communities are small in size, usually less than one-quarter acre. Grasses, sedges, herbaceous plants and shrubs dominate them.

High-Energy Riverbank

High-energy riverbank communities are rare in Massachusetts, however they are found in steep gradient, high flood areas on fast-flowing rivers. They typically occur on riverbeds and the upstream ends of islands. These communities are created by cobbles, sand and silt being deposited during spring floods. Plants associated with this community vary depending upon the composition of the substrate and the severity of annual flooding. On open cobbles, false dragonhead (*Physostegia virginiana*), cocklebur (*Xanthium strumarium*), beggar's ticks (*Bidens* spp.) and lady's thumb (*Polygonum persicaria*) are dominant. As the amount of sand increases, water horsetail (*Equisetum fluviatile*) and clasping dogbane (*Apocynum sibiricum*) occur. There is also definitive band of switchgrass *(Panicum virgatum*). In the sandiest environments, mixed grasses of switchgrass, big and little bluestem (*Andropogon gerardii* and *Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*) and goldenrods (*Solidago* spp.) are found. Due to the intense flooding, trees and/or tall shrubs are not able to establish themselves in the high-energy riverbank environment. However, short shrubs such as shadbush (*Amelanchier sanguinea*), silky dogwood (*Cornus amomum*), sandbar willow (*Salix exigua*) and sandbar cherry (*Prunus pumila var. depressa*) can be found on the sandiest sections, which typically border floodplain forests.

Riverside Seep

Riverside seeps occur at the base of steep riverbanks where groundwater seeps out of the bottom of the slope. These seepages are usually mineral rich leading to great plant diversity. Periodic flooding helps to prevent woody shrubs from establishing themselves. The riverside seeps known to occur along the Deerfield River are not calcareous (limey), which is common with the seeps along the Connecticut River in Vermont and New Hampshire. Riverside seeps are often associated with riverside outcrop communities and high-energy riverbanks.

Vegetation is that of a mixed herbaceous community with the wettest spots being mossy with a mixture of herbs and sedges. The muskflower (*Mimulus moschatus*), a threatened species, utilizes riverside seeps as habitat.

Bat Hiberaculum

According to the NHESP, the Town of Charlemont is home to a bat hibernaculum. Several bat species in the United States spend winter hibernating in caves or abandoned mines (bat

hibernaculums). Cave bats return yearly to the same hibernaculum and often to the same location within the hibernaculum (U.S. Fish and Wildlife Service Website; 2003).

D.3 Agricultural Land

In 1997, agricultural land in Charlemont comprised 8.7 percent of the town's total land area (MassGIS; 2002). The 1997 U.S. Census of Agriculture indicated that Charlemont had twentyfour farms, twenty-two of which were over forty-nine acres in size. They do not however, provide municipal-level data for the specific amount of land in farms. According to the Agricultural and Forestry Lands Map of the Town of Charlemont's Master Plan (2001), the town's agricultural land is located primarily along:

- The Deerfield River;
- Warner Hill;
- Tower Road;
- Burrington Road;
- Legate Hill and Tatro Roads;
- Maxwell Road;
- Warfield Road;
- Route 8A and Vincent Road;
- Mountain Road;
- Heath Road;
- Burnt Hill Road; and
- Along East and West Oxbow Roads.

D.4 Rare, Threatened and Endangered Plant Species

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife has designated several "Priority Habitat" areas in the Town of Charlemont. A Priority Habitat is an area where plant and animal populations protected by the Massachusetts Endangered Species Act Regulations (321 CMR 10.00) may occur. These areas include:

- A small circular area on the eastern slope of Todd Mountain;
- An oval shaped area from the summit of Todd Mountain west across the town line into the Town of Florida;
- Along the entire length of Pelham Brook in Charlemont;
- Along the Deerfield River from the Florida town line to the confluence with the Cold River;
- Along the Cold River;
- A small area on the eastern side of Zoar Road just past the intersection of Route 2;
- Along the Deerfield River from the confluence with Wheatherby Brook east to the Charlemont town line;

- Along Avery Brook from the confluence with the Deerfield upstream one-half mile; and
  • A small area in the wetlands and uplands between Willis and Avery Brooks. *(See Open Space Map).*

NHESP has identified 241 native plant species as rare in the Commonwealth, and a number of rare plants have been documented in the Town of Charlemont (See Table 4-1). These plants occur in some of the Priority Habitats identified above. Plants (and animals) listed as *endangered* are at risk of extinction (total disappearance) or extirpation (disappearance of a distinct interbreeding population in a particular area). *Threatened* species are likely to become endangered in the foreseeable future. Species of special concern have been documented to have suffered a decline that could result in its becoming threatened, or occur in very small numbers and/or have very specialized habitat, the loss of which could result in their becoming threatened (NHESP and The Nature Conservancy, *Our Irreplaceable Heritage: Protecting Biodiversity in Massachusetts;* 1998).

Table 4-1: Rare Plant Species in the Town of Charlemont

Scientific Name	Common Name	State Status
Aplectrum hyemale	Putty Root	Endangered
Triphora trianthophora	Nodding Pogonia	Endangered
Trisetum triflorum spp. molle	Spiked False Oats	Endangered
Carexl lenticularis	Shore Sedge	Threatened
Viola nephrophylla	Northern Bog Violet	Threatened
Platanthera flava var. herbiola	Pale Green Orchis	Threatened
Mimulus moschatus	Muskflower	Threatened
Alnus viridis spp. crispa	Mountain Alder	Special Concern
Panax quinquefolius	Ginseng	Special Concern
Ribes lacustre	Bristly Back Currant	Special Concern
Aster tradescantii	Tradescant's Aster	Special Concern
Corallorhiza odontorhiza	Autumn Coralroot	Special Concern
Prunus pumila var depressa	Sandbar Cherry	Special Concern

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2002.

E. FISHERIES AND WILDLIFE

Charlemont's upland forests, rivers, wetlands, and open farmland provide habitat for a variety of common and rare wildlife species. This section discusses wildlife species and their habitats from the perspective of natural communities, individual species, and patterns of wildlife distribution and movement across the landscape.

The BioMap Project of the Natural Heritage & Endangered Species Program has identified areas throughout the state that are critical to supporting the maximum number of terrestrial and wetland plant and animal species and natural communities. The BioMap uses Estimated Habitat and other records to identify the areas most in need of protection to safeguard the native

biodiversity of the Commonwealth. It focuses primarily on state-listed rare species and exemplary natural communities and was developed to promote strategic land protection.

The BioMap divides the state into thirteen distinct ecological regions based on geology, soils and plant and animal communities. Within each region, scientists have designated "Core Habitat" and "Supporting Natural Landscape." Core Habitat areas include the most viable habitat for rare plants and animals and exemplary natural communities. Supporting Natural Landscape includes buffer areas around Core Habitat, large undeveloped patches of vegetation, large areas without roads and undeveloped watersheds. In Charlemont, there are several Biomap areas, which include both Core Habitat and Supporting Natural Landscape. These areas include much of the eastern section of Charlemont from Willis Brook east to the town line. In the western part of town, the area includes the Todd Mountain area of the Mohawk Trail State Forest, part of the Deerfield River, and the Legate Brook area.

E.1 General Description and Inventory of Wildlife and Wildlife Habitats

The Town of Charlemont contains a significant amount of upland and floodplain habitat. Forests in Charlemont consist of large unbroken tracts, which allow for wildlife species movement within the town and the surrounding region.

Based on the forest type, individuals of the following species of wildlife are likely to be found in Charlemont at least once as members of migrating, wintering, or breeding populations. The lists are based on information presented in New England Wildlife: Management of Forested Habitats by R.M. DeGraaf et. al., published in 1992, which correlates wildlife with the major forest type in the area. The species are listed by category (amphibians, reptiles, birds, or mammals), then by type of habitat and by size of home range. It is by no means a complete inventory of all species that may be found in Charlemont.

E.1.1. Amphibians

These species are found in forest, wetland, and open upland habitats and require a home range 110 acres in size:

Red-spotted Newt, Four-toed Salamander, Red-backed Salamander, Eastern American Toad, Northern Spring Peeper, Bullfrog, Green Frog, Wood Frog, Gray Tree Frog, Northern Leopard Frog, and Pickerel Frog.

This species is found in forest habitats and requires a home range 11-50 acres in size: Spotted Salamander

E.1.2. Reptiles

These species are found in forest, wetland, and open upland habitats and require a home range 110 acres in size:

Wood Turtle, Spotted Turtle, Eastern Painted Turtle, Eastern Box Turtle, Eastern Garter Snake, Northern Redbelly Snake, Eastern Ribbon Snake, Northern Ribbon Snake, Eastern Hognose Snake, Northern Ring-neck Snake, Eastern Smooth Green Snake

This species is found in forest, wetland, and open upland habitats and requires a home range 1150 acres in size:

Common Snapping Turtle

This species is found in forest, wetland, and open upland habitats and requires a home range >50 acres in size:

Eastern Milk Snake, Black Rat Snake

E.1.3. Birds

These species are found in forest /nonforested habitats and require a home range 1-10 acres in size:

Common Goldeneye, Hooded Merganser, Common Merganser, Ruby-throated Hummingbird, Yellow-bellied Sapsucker, Downy Woodpecker, Hairy Woodpecker, Northern Flicker, Eastern Wood-Pewee, Yellow-bellied Flycatcher, Willow Flycatcher, Least Flycatcher, Eastern Phoebe, Black-capped Chickadee, Tufted Titmouse, House Wren, Carolina Wren, Winter Wren, Golden Crowned Kinglet, Ruby Crowned Kinglet, Blue-gray Gnatcatcher, Eastern Bluebird, Bobolink, Veery, Hermit Thrush, Wood Thrush, American Robin, Brown Thrasher, Cedar Waxwing, Solitary Vireo, Yellow-throated Vireo, Warbling Vireo, Philadelphia Vireo, Red-eyed Vireo, Blue-winged Warbler, Tennessee Warbler, Nashville Warbler, Northern Parula, Yellow Warbler, Chestnut-sided Warbler, Blackthroated Blue Warbler, Yellow-rumped Warbler, Black-throated Green Warbler, Blackburnian Warbler, Prairie Warbler, Blackpoll Warbler, Black-and-White Warbler,
American Redstart, Worm-eating Warbler, Ovenbird, Louisiana Waterthrush, Northern Waterthrush, Song Sparrow, Lincoln Sparrow, White-throated Sparrow, Dark-eyed Junco, Common Grackle, Brown-headed Cowbird, Northern Oriole, Rufous-sided Towhee, Purple Finch, Scarlet Tanager, Northern Cardinal, Rose-breasted Grosbeak, Indigo Bunting, Great Crested Flycatcher, Eastern Kingbird, Tree Swallow, Blue Jay, Mourning Warbler, Common Yellowthroat, Wilson's Warbler, Canada Warbler, Chipping Sparrow, Field Sparrow, Grasshopper Sparrow, Henslow's Sparrow, American Goldfinch, Gray Catbird, Great Blue Heron, Green-backed Heron, Wood Duck, American Black Duck, Green-winged Teal, Mallard, Northern Pintail, Blue-winged Teal, Northern Shoveler, Common Egret, American Wigeon, Canvasback, Ring-necked Duck, American Goldfinch, Evening Grosbeak, American Redstart, Red Crossbill, European Starling, Sora, Killdeer, Spotted Sandpiper, Common Snipe, Northern Mockingbird, Eastern Pheoebe, Mourning Dove, Pine Siskin, Northern Waterthrush, Virginia Rail, Eastern Kingbird, Pine Siskin.

These species are found in forest/nonforested habitats and require a home range 11-50 acres in size:

Ring-necked Pheasant, Ruffed Grouse, Upland Sandpiper, Black-billed Cuckoo, Yellowbilled Cuckoo, Common Nighthawk, Whip-poor-will, Northern Rough-winged Swallow, Bank Swallow, Barn Swallow, Purple Martin, Red-breasted Nuthatch, White-breasted Nuthatch, Brown Creeper, American Woodcock, Horned Lark, Muted Swan, Canada Goose.

These species are found in forest/nonforested habitats and require a home range >50 acres in size:

Turkey Vulture, Bald Eagle, Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Redshouldered Hawk, Broad-winged Hawk, Red-tailed Hawk, Golden Eagle, American Kestrel, Peregrine Falcon, Wild Turkey, Great Horned Owl, Eastern Screech-Owl, Great Gray Owl, Barred Owl, Northern Saw-whet Owl, Pileated Woodpecker, American Crow, Common Raven, Chimney Swift, Belted Kingfisher, Northern Harrier.

These species are found in forest/nonforested habitats with unknown home ranges:

American Tree Sparrow, Bohemian Waxwing, Northern Shrike, Common Redpoll.

E.1.4. Mammals

These species are found in forest habitats and require a home range 1-10 acres in size: Eastern Cottontail, Snowshoe Hare, Eastern Chipmunk, Gray Squirrel, Red Squirrel, Northern Flying Squirrel, Beaver, Deer Mouse, White-footed Mouse, Shrew, Northern Shorttailed Shrew, Hairy-tailed Mole, White-footed Mouse, Meadow Vole, Star-nosed mole, Eastern mole, Muskrat.

These species are found in forest habitats and require a home range 11-50 acres in size: Virginia Opossum, Porcupine, Ermine.

These species are found in forest habitats and require a home range >50 acres in size:

Woodchuck, Coyote, Red Fox, Grey Fox, Black Bear, Raccoon, Marten, Fisher, Striped Skunk, River Otter, Lynx, Bobcat, White-tailed Deer, Moose.

These species are found in forest/nonforested habitats with unknown home ranges: Little Brown Myotis, Big Brown Bat.

E.2 Rare, Threatened and Endangered Wildlife Species

NHESP has mapped several "Priority Habitats of Rare Species" and "Estimated Habitats of Rare Wildlife" in the Town of Charlemont. Rare species habitat is located in the following areas:

- Along the entire length of Pelham Brook in Charlemont;
- Along the Deerfield River from the Florida town line to the confluence with the Cold River;
- Along the Cold River;

- Along the Deerfield River from the confluence with Wheatherby Brook east to the Charlemont town line; and,
- Along Avery Brook from the confluence with the Deerfield upstream one-half mile.

These habitats provide for wildlife species that are endangered, threatened and of special concern. Charlemont's rare, threatened and endangered wildlife species are listed in Table 4-2.

Table 4-2: Rare, Threatened and Endangered Wildlife Species found in Charlemont

Scientific Name	Common Name	State Status
Invertebrates		
Rhodoecia aurantiago	A Noctuid Moth	Threatened
Cincindela duodecimguttata	Twelve-Spotted Tiger Beetle	Special Concern
Cincindela purpurea	Purple Tiger Beetle	Special Concern
Vertebrates		
Haliaeetus leucocephalus	Bald Eagle	Endangered
Oporornis philadelphia	Mourning Warbler	Special Concern
Ambystoma jeffersonianum	Jefferson Salamander	Special Concern
Catostomus catostomus	Longnose Sucker	Special Concern
Clemmys insculpta	Wood Turtle	Special Concern
Gyrinophilus porphyriticus	Spring Salamander	Special Concern

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2002.

E.3 Conserving Charlemont's Biodiversity

There are two concepts that can be used to help explain Charlemont's options for pursuing the conservation of the town's biodiversity: Island Biogeography and landscape ecology.

The theory of Island Biogeography is based on observations that biodiversity is greater on large islands than on small ones, and greater on islands that are close to the mainland. The concept of islands surrounded by water has been applied to the idea of "islands" of protected open space surrounded by developed areas. Based on this theory, ecologists predict that increasing the size of a protected area increases its biodiversity (MacArthur and Wilson; 1967). Therefore, connecting two protected areas via a protected corridor to create one large area should also increase natural biodiversity (Wilson and Willis; 1975).

Another model for wildlife habitat protection aggregates similar land uses while allowing other uses in discrete areas (Forman; 1997). This model is reflected in Charlemont in that the several villages and the floodplain areas concentrate development, agriculture is concentrated where prime farmland soils occur along river corridors, and large blocks of forest remain intact.

Individual animals move within a landscape. When and where wildlife and fish species move is not well understood by wildlife biologists. However, we do know that animals pay little attention to political boundaries. Wildlife seek natural cover for shelter and food, but some species willingly forage where human uses, such as farm fields, gardens and even trash cans, provide browse or food. As the land within Charlemont continues to be fragmented by

development, it is reasonable to expect that remaining large blocks of undeveloped forest and the parcels of land connecting them will become more important to area wildlife, and that conflicts between the needs of wildlife and residents will become more common.

Many species of wildlife in Charlemont have home ranges greater than fifty acres in size. Even those species with smaller home ranges move across the landscape between sources of shelter, water, food and mating areas. Some animals, including white-tailed deer and black bear, seek both interior forest habitat and wetland edges where food sources may be more abundant.

Roads are a form of connection for humans but they can be an impediment to some wildlife movement. Wildlife benefit from having land to move within that is isolated from human uses. Conservation planning that recognizes this need often focuses on the development of wildlife corridors. Permanently protected wildlife corridors are particularly critical in a landscape which is experiencing development pressures to ensure that animals have the ability to travel across vegetated areas between large blocks of habitat.

Connections between bodies of water and sub-watersheds are also important for wildlife and fisheries species. Some of the more common animals that use river and stream corridors are beaver, muskrat, raccoon, green heron, kingfish, snapping turtle, and many species of ducks, amphibians, and fish. Since many species rely on a variety of habitats during different periods of their life cycle, species diversity is greatest in areas where several habitat types occur in proximity to each other. With this in mind, the protection of all habitat types is vital for maintaining and enhancing biodiversity in Charlemont.

How will the Town of Charlemont determine the most appropriate conservation strategies for wildlife habitat? There are three general paths to follow in conserving the health of wildlife populations. One is to protect the habitat of specific species that are rare, threatened, or endangered. It is thought that other species will also benefit from this strategy. A second path is to conserve landscape-level resources such as contiguous forest or riparian areas. This helps to protect the habitats of a large number of species, but it might not meet the needs of all rare and endangered species. The third method is a combination of the first two. Maintaining the biodiversity of Charlemont over the long term will likely require the protection of both unique habitats for specific species and networks of habitat across the landscape. Conservation strategies for the town to consider include monitoring of species locations, numbers, and movements; the protection of core habitat areas as identified by the NHESP BioMap (*see Open Space Map*); the continued protection and linkage of large blocks of contiguous forestland; the retention of early successional habitats like fields and grasslands; and the protection of vernal pools, wetlands, and riparian corridors that sustain the greatest diversity of life in Charlemont.

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

The characteristics that allow a stranger to distinguish Charlemont from other towns in the region may be different than the unique qualities and special places that only residents can really know. This section identifies the scenic resources and unique environments that most Charlemont residents would agree represent the essence of Charlemont's character.

In many ways the history of Charlemont--how people came to settle the land, use its resources, and enjoy its forests, streams, and bodies of water--can be seen in the landscapes that have retained a sense of the past. The unique environments in Charlemont play a very important role in providing residents with a sense of place. Brooks, mountains, wetlands, and village centers provide markers on the landscape within which we navigate our lives.

Scenic landscapes often derive their importance from location relative to other landscape features. The purpose of inventorying scenic resources and unique natural environments in Charlemont is to provide a basis for setting resource protection priorities. To this end, the following section includes information about the different values associated with each scenic resource and natural environment, and indicates areas where multiple values are represented in one landscape. Those landscapes that contain, for example, scenic, wildlife, and cultural values may be given higher priority for protection than a landscape that contains only one value (See Table 4-3).

These documented resources include historic landscapes and special places. This inventory is based on a formal survey done in 1992 for the Franklin County Rural Historic Landscape Preservation Plan Report, as well as sources listed following the table. This document distinguishes between types of landscapes, identifies in general terms the locations of rural historic landscapes in each town, and provides examples of different preservation strategies. The methodology for identifying significant historical landscapes was based on National Park Service criteria including area of significance, period of significance and historical integrity. NPS classifies landscapes into four different categories: landscapes that reflect major patterns of a region's history (e.g. agricultural landscapes), landscapes that are associated with historically significant individuals (e.g. institutional grounds and buildings), landscapes that are important due to their design or physical characteristics (e.g. an 18th century Colonial Period Connecticut Valley rural farm), and landscapes that yield or have the potential of yielding significant information on pre-history or history (e.g. a native American encampment site).

Table 4-3: Significant Scenic/Ecological/ Recreational/and Historic Landscapes/Environments in Charlemont

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
	Stream Corridors			
1	Deerfield River	Priority habitat of rare species; High and low yield aquifers	High value; Non-motorized boating, fishing	Historic Native American trail; Hawk's, Rice's & Taylor's Forts, c.1740s
2	Pelham Brook	Priority habitat of rare species; Low yield aquifer		
3	Todd Brook			
4	Patch Brook	High yield aquifer in southern section		
5	Legate Hill Brook	Low yield aquifer in southern section		

6	Rice Brook			Prehistoric site
7	Vincent Brook			
8	Maxwell Brook	Low yield aquifer		
9	Tatro Brook			
10	Davis Mine Brook			
11	Mill Brook	Low yield aquifer		Historic sawmills site c. 1790s
12	Hartwell Brook	Low yield aquifer		
13	Willis Brook	Low yield aquifer		
14	Avery Brook	Priority habitat of rare species (southern end); Low yield aquifer		Historic sawmills, c. 1790s
15	Wilder Brook	Low yield aquifer		
16	East Oxbow Brook	Low yield aquifer (southern end)		
17	Albee Brook			
18	Wheatherby Brook			
19	Bozrah Brook	Low yield aquifer (northern end)		
20	Chickley River	Low yield aquifer		
21	Cold River	Priority habitat of rare species; Low yield aquifer		Prehistoric sites
22	Trout Brook			
	Wetlands			
23	Zoar Road wetlands	Diverse habitats		
24	Mountain Road wetlands (north of Bald Mt.)	Diverse habitats		
25	West Oxbow Road wetlands	Diverse habitats		
26	Tea Street Wetland	Diverse habitats		
27	Feder Wetlands	Diverse habitats		
28	Avery Brook Wetlands	Diverse habitats		

Map #	**Scenic Resources**	**Ecological/ Geological Resources**	**Recreational Value**	**Historical Value**
29	Windy Hill Wetland	Diverse habitats		
	Agricultural Lands			
30	Route 2, multiple farmstead sites			*Historical Agricultural Landscapes*
31	Heath Road, multiple farmstead sites			*Historical Agricultural Landscapes*
32	Route 8A, multiple farmstead sites			*Historical Agricultural Landscapes*

33	Kirin Farm, Mountain Road			*Historical Agricultural Landscapes*
34	Hawk Farm			*Historical Agricultural Landscapes*
35	Harris Farm			*Historical Agricultural Landscapes*
36	Griffin Farm			*Historical Agricultural Landscapes*
37	Hicks Farm			*Historical Agricultural Landscapes*
38	Blue Heron Farm, Warner Hill Road			*Historical Agricultural Landscapes*
	Historic Industrial Area			
39	Hall Tavern Farm, Route 2			*Historical Agricultural/ Industrial Landscape*
	Villages			
40	Charlemont Center	Low yield aquifer	Concerts, boating, art exhibits	National Historic District, structures dating from 1749
41	East Charlemont			*Historical Community Development Landscape*
42	Zoar Village			*Historical Community Development Landscape*
	Recreational Areas			
43	Mohawk Trail State Forest	Priority habitat of rare species; High yield aquifer	Hiking, swimming, fishing, cross country skiing, horseback riding	Indian encampment; Historic trail sites
44	Zoar Outdoor / Deerfield River		Non-motorized boating	
45	Crabapple Whitewater/ Deerfield River		Non-motorized boating	
46	Mohawk Park, Route 2 (Early Modern Tourist Cabins)		Cabins	c. 1930
47	Charlemont Fairground, Route 8A		Yankee Doodle Days, Reggae Fest	Established 1850
48	Hawlemont School		Baseball fields	Historic Structure
49	Indian Plaza		Native American Powwows	c. 1930

Map #	**Scenic Resources**	**Ecological/ Geological Resources**	**Recreational Value**	**Historical Value**
50	Campground		Camping	
51	Berkshire East Ski Resort		Skiing, snowboarding	
	Transportation Corridors			

52	Route 2 (Historic Mohawk Trail)	Priority habitat of rare species; High and low yield aquifers	High value; Scenic views	Indian trail to Hudson Valley; Multiple historic sites; County Rd. laid out in 1754; 1914 auto highway
53	Railroad Depot and related system, Route 8A			Tracks through historic Hoosac Tunnel, 1875
54	Mahican Mohawk Trail	Priority habitat of rare species	High value; Scenic views	Historic Native American trail with native encampment sites
55	Route 8A			Historic 1760s highway to Heath
56	Legate Hill Road			Fort Pelham Highway (1750s)
57	Avery Brook Road			Road built to Heath in 1763
58	Old Center Heath Road			Road built to Heath in 1753
59	East Oxbow Road			Military Rd between Forts Morrison & Taylor
	Cultural Sites			
60	Little Red Schoolhouse			Oldest one room brick schoolhouse in Massachusetts
61	Shunpike			Site of toll road bypass
62	Moses Rice Monument and Grave Site			Grave site of the first settler of the Town of Charlemont
63	Hawks Cemetery			
	Unusual Natural & Geologic Features			
64	Blueberry Peak	Bald rock hilltop		
65	Burnt Hill	Bald rock hilltop		
66	Pocumtuck	Bald rock hilltop		
67	Buttonball Tree			Historic tree at Warner homestead
68	Historic Old Oak			Historic meeting place
	Scenic Views			
69	Mohawk Trail Scenic Byway		Scenic views	
70	Deerfield River		Scenic views	
71	Berkshire East Ski Resort		Scenic views	
72	Legate Hill Road		Scenic views	
73	Warfield Road		Scenic views	
Map #	**Scenic Resources**	**Ecological/ Geological Resources**	**Recreational Value**	**Historical Value**
	Unusual Natural Communities			

74	Rich, Mesic Forest	Rare habitat; Old growth forest		
75	Rocky Summit/Rock Outcrop Community	Rare habitat		
76	High Energy Riverbank	Rare habitat		
77	Riverside Seep	Rare habitat		
	Bat Hibernaculum	Rare habitat		

Sources: *Franklin County Rural Landscape Preservation Plan Report*, Franklin County Commission, 1992; Natural Heritage and Endangered Species Program, Correspondence, 2002; *Charlemont Master Plan Background Document*, Center for Rural Massachusetts, 1998; Charlemont*, Massachusetts; Frontier Village and Hill Town*, Allen Healy, 1986; *Reconnaissance Survey Report for Charlemont,* Mass. Historic Commission, 1982, *Mohawk Trail Scenic Byway Corridor Management Plan*, FRCOG & Berkshire RPC, 2002. MassGIS, 2003.

G. ENVIRONMENTAL PROBLEMS

According to the Open Space Planning Committee, there are three main types of environmental problems in Charlemont: non-point source pollution, other potential impacts of development, and threats to the ecological integrity of the Deerfield River. Non-point source pollution occurs when pollutants are generated not by a single source like an outflow pipe from a factory but from improper land use across landscapes both suburban and rural. For example, Charlemont residents can unknowingly contaminate groundwater by failing to update their private septic systems to limit leaching into rivers and streams and by improperly disposing of household hazardous materials like petroleum products, wood preservatives, and pesticides. Non-point source pollution can result in the contamination of both surface and groundwater and involve other types of pollution. Sources of pollution thought to be of greatest concern to residents include the Charlemont Landfill, road salt, used car dumps, gravel roads, contamination from the railroad corridor, motor vehicle traffic and trash and litter. Other environmental problems in Charlemont include threats to the ecological integrity of the Deerfield River including acid mine drainage from the Davis Mine in Rowe, invasive plants, and flow peaking problems caused by the use of the river to generate power.

G.1 Non-point Source Pollution Problems

Charlemont Landfill

According to the Massachusetts Department of Environmental Protection's Bureau of Waste Prevention, the Charlemont Landfill, located off of Rte. 8A at the base of Warner Hill on the Heath town line, is uncapped, unlined, and of an unknown acreage. Closed in 1972, residents are concerned about this inactive landfill, which may be leaching potential pollutants. Any town actions to be taken toward protecting local wetlands, streams, and groundwater from potential leachate down slope of the landfill may be constrained by the cost of properly containing the material at the site.

Roadside De-icing Materials

Another example of non-point source pollution of concern by residents is the use of road salt along Rte. 2. Although, road salt on other roads in town may be of concern, its use on Rte. 2 is particularly worrisome due to the fact that the town's only potential high yield aquifer runs parallel to and beneath portions of both the Deerfield River and the state highway in the western portion of town. The use of wintertime de-icing materials can result in road salt runoff and groundwater contamination. For example, the Deerfield Fire District lost use of its Wapping Well due to sodium contamination from road salt use along Rte. 5/10. For this reason, Charlemont residents are interested in exploring the use of alternatives to road salt as a deicing material. According to Larry Salvatore, Maintenance Operations Engineer for MassHighway, District 1, some alternatives to road salt use include a lower salt/sand ratio, a low salt/calcium chloride mix, and the use of hops. Hops have been used in place of a straight salt and sand mix by some communities including Pittsfield. Although the type of hops used are a byproduct of the beer making process, they are thought to be more expensive than road salt. Even if hops do cost more than salt per unit volume, the benefits in reduced risk of groundwater and surface water contamination may be worth the price.

Used Car Dumps

Unfortunately, used car dumps and junkyards are not uncommon throughout Franklin County. Cars can leak hazardous materials that can contaminate the groundwater overtime. Charlemont could develop a water resource protection overlay district to help minimize the risk of groundwater and aquifer contamination. One example of a water resource protection overlay district, which has been approved by the Massachusetts Department of Environmental Protection (DEP) where a town has received grant funding for aquifer land acquisition, includes the prohibition of automobile graveyards and junkyards.

Gravel Roads

Gravel roads, if not properly maintained, can produce impacts to local wetlands and surface waters due to erosion and sedimentation. There are no statewide standards for the design of gravel roads mainly because the Massachusetts Highway Department does not maintain any. The DEP administers the Massachusetts Wetlands Protection Act to ensure that any wetlands within 100 feet of a gravel road project would be protected. The Wetlands Protection Act protects these resource areas and typically a permit is required for any highway project that might impact them. If the impact, erosion and siltation for example, had been caused in the absence of a formal project, the Conservation Commission can still initiate action to protect the resource area.

Guilford Transportation Systems, Inc.

According to Charlemont residents, Guilford Transportation Systems, Inc., which runs the railroad line through the town, has been less than helpful in its communications with the Select Board. Select Board members, motivated in part by the frequency of derailments along a

particular ½ mile stretch of track, have sought information from Guilford relating to the type of materials transported on their lines. Staff at the Region 1 Office of the Federal Railroad Administration in Cambridge, Massachusetts referred to the Code of Federal Regulations as the ultimate source of information relating to materials transported by Guilford. Code 49, part 172.101 tabulates the substances subject to federal regulations, which can therefore be transported by carriers. The 55-page long table includes all types of hazardous materials and the manner in which they need to be transported.

Automobile-Related Non-point Source Pollution

Two other types of environmental problems may be attributed to the traffic caused by people passing through Charlemont from surrounding areas. A lack of public transportation has helped to ensure that as the population and the popularity of the region increases the vehicular traffic and its associated impacts will also rise. Non-point source pollution associated with automobiles include leaking petroleum products and other hazardous materials, air pollutants, and trash. Trash and litter are considered to be environmental problems by residents. Litter can be an eyesore as well as a health hazard.

G.2 Other Potential Impacts of Development

Although there may not be agreement as to its severity or solution, another environmental problem for Charlemont is the potential for future growth in the region and the negative impacts of the development of approval-not-required frontage lots. The build-out analysis in Section 3 forecasts that residential development will produce negative fiscal impacts on the municipal budget. In a growing community, the costs of community services including public education can be greater than the revenues generated through real estate taxes.

Some people argue that current development constraints, mainly related to soil characteristics, are sufficient to control development. The depth to the groundwater, depth to bedrock, and the steep slopes are three characteristics, which restrict where people may build. Others would point to changes in technology and regulations, which have the potential for reducing those limitations on development.

New residential development across town would likely increase the prevalence of non-point source pollution, reduce the rural character and cause a reduction in the acreage in, and value of, remaining wildlife habitat. Sprawl would also increase runoff (potentially including contaminants such as road salt), decrease the recharge to ground water, decrease stream flow, and increase erosion. Increases in runoff would diminish biodiversity in first and second order streams. One solution to the problem could be a combination of zoning techniques to encourage development in suitable areas and open space protection to minimize development in areas with the greatest scenic, ecological, cultural, and historical values. The Community has already started to pursue grants to revive old subdivision roads to allow for growth in areas that will accommodate development while addressing concerns over open space.

G.3 Threats to the Ecological Integrity of the Deerfield River

The following information under subsection G.3 is from text prepared by Gisela Walker of the Deerfield River Watershed Association.

Acid Mine Drainage from the Davis Mine in Rowe

Davis Mine Brook, a tributary of the Deerfield River, is a 303d listed segment (3.8 miles) that is impaired by acid mine drainage from Davis Mine. The entire length of the brook below where the mine drainage enters appears to be devoid of aquatic life. The University of Massachusetts has received a National Science Foundation grant to study the biology, chemistry and hydrology of the site. The UMass study and other existing data from the site could be used to develop a §319 project to reduce the impacts of acid mine drainage to Davis Mine Brook.

Invasive Japanese Knotweed

The invasive plant, Japanese knotweed, is pervasive along the main stem of the Deerfield and in some sub-watersheds. Japanese knotweed is native to Eastern Asia and is one of the first plants to appear on volcano slopes after volcanic activity. It was introduced to the United Kingdom as an ornamental in 1825, and from there to North America in the 19th Century.

It appears to be shade intolerant and does very well along roadways and rivers. It reproduces by seed and large rhizomes, which may reach a length of 40 to 60 feet. A small piece of rhizome can float down a river and begin to grow once it is deposited on land.

This plant is a threat to native vegetation because it often forms dense patches, which shade out all other plants. It is a particular threat in riparian areas where it can survive floods and quickly colonize scoured streambanks. Japanese knotweed is difficult to eradicate once it has become established.

Flow Peaking Problems Caused by the Use of the River to Generate Power

The cold, clean water of the Deerfield River and its tributaries support a native fish community and stocked trout. Because of its high gradient, the Deerfield River also has hydropower dams. A 2023 FERC hydro re-licensing settlement established minimum flows in 12 miles of river that were previously bypassed, required maintenance and monitoring of dissolved oxygen and temperature conditions, and provided commitments for future fish passage facilities. Nevertheless, the effects of fluctuating water levels created by hydro peaking on fish communities and other stream biota in the river continue to be a concern to local watershed groups, fishing organizations, and others.

Rapid changes in flow caused by hydroelectric power generation create unstable habitats that can reduce the abundance and diversity of riverine fish. Changes in water levels displace shallow shoreline zones, forcing fish in those areas to relocate, stranding fish, or exposing trapped fish to predation. Flow fluctuations can also degrade the quality of shoreline habitat by altering macro invertebrate communities, aquatic and riparian vegetation, and availability of structure such as woody debris. A study in the Deerfield River prior to the establishment of minimum flows (Bain; 1988) demonstrated that variable stream flows modified the fish community composition in the River. The study demonstrated that small fish and size classes that use relatively shallow habitats (habitats slow in velocity and concentrated along stream margins in pools and riffles) were eliminated from sites in the Deerfield River that had the greatest fluctuations in flow.

Legend

Table 9-1 continued

- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers

River Protection Act

- 0-100 feet from river bank
- 100-200 feet from river bank

- Water body
- National Wetland Inventory wetland
- Interim Wellhead Protection Area
- Surficial Geology: sand/gravel and floodplain alluvium (low yield aquifer)
- Aquifer: Potential yield 25-1,000 gallons per minute (medium yield aquifer)
- Public water supply sources
- Deerfield River Watershed

Map Sources:

Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.

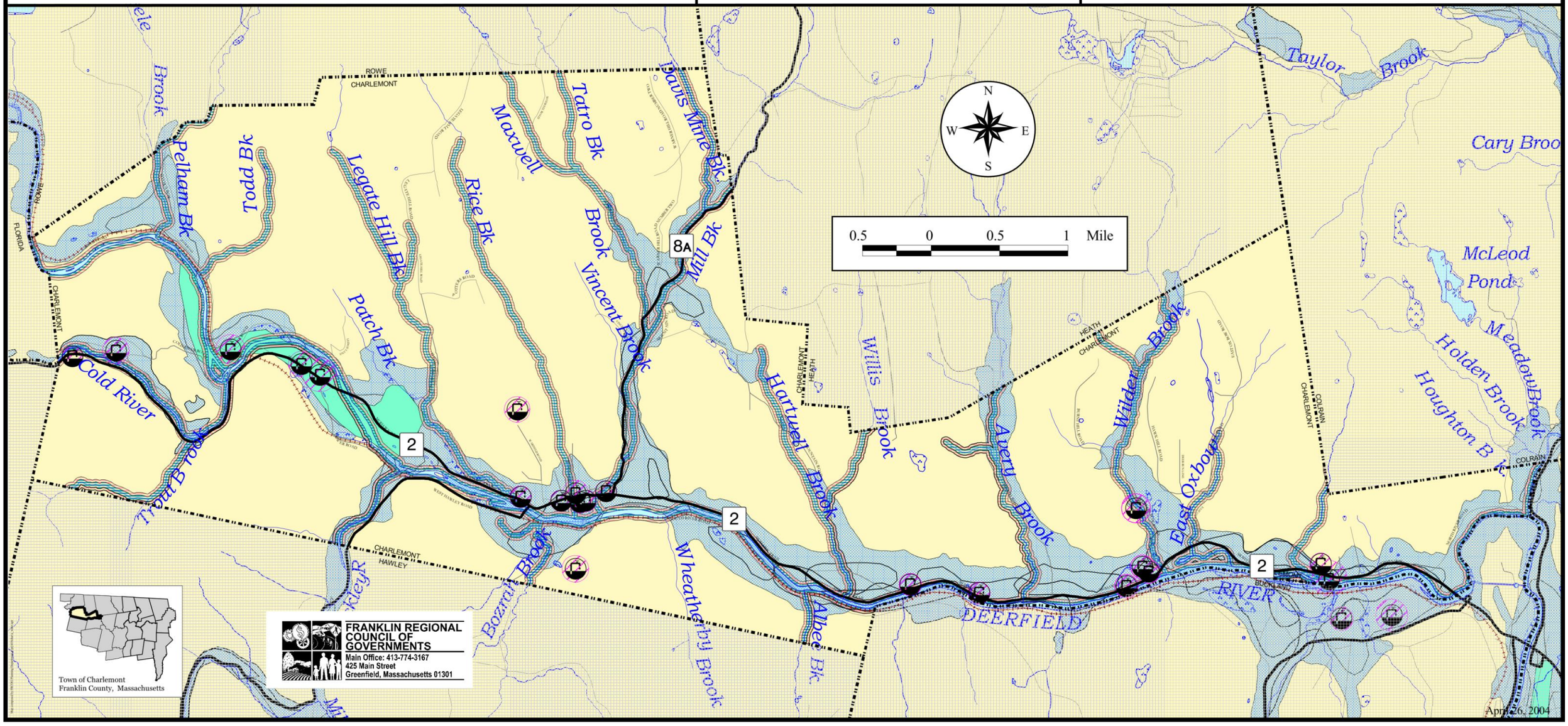
Road data provided by Massachusetts Highway Department.
Town line, rail line, zone II and interim wellhead protection area, public water supply, aquifer, surficial geology, River Protection Act, National Wetlands Inventory, major basin, river, stream, and pond data providedby MassGIS.

Note: Depicted boundaries are approximate and are intended for planning purposes only.
Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.

Town of Charlemont

Open Space and Recreation Plan

Water Resources



SECTION 5

Inventory of Lands of Conservation and Recreation Interest

Open space in Charlemont encompasses a variety of land types such as farms, forests, parks, and recreational areas, which are managed by both public and private entities. This section provides an overview of the lands that offer important ecological, recreational, and scenic benefits while being protected from development to varying degrees.

Definition of Open Space and Protection

In general, "open space" refers to land that is undeveloped. The focus of an Open Space and Recreation Plan is on those undeveloped areas that provide numerous benefits to the community, such as wildlife habitat, farmland, forest products, groundwater recharge, recreational opportunities, and the preservation of scenic views and important cultural landscapes. "Natural resources" include the elements of the environment—air, water (surface and groundwater), soil, vegetation, wildlife, and fisheries—that people depend on for both their livelihood and quality of life.

Open space and recreational lands can be protected from development through several mechanisms, which vary in the level of legal protection they provide. When land is described as "protected," it means that the land is intended to remain undeveloped for the long term. This protection may be achieved through ownership by a state conservation agency, a local conservation commission, or a nonprofit land trust, or through the attachment of a legal conservation restriction to the deed.

Levels of Protection

- **"Protected" land** refers to land that is preserved from development either through direct ownership by a public agency or nonprofit organization, or by a legally binding conservation restriction that limits certain uses of the property, such as development.
- **"Limited protection"** applies to land where there is some level of legal safeguard, but it may be subject to change, such as land owned by municipalities or water districts with more flexible use options.
- **"Temporary protection"** is provided through mechanisms like the Massachusetts Chapter 61 programs, which offer tax relief to landowners in exchange for maintaining the land in agricultural, forest, or recreational use. However, this protection is subject to expiration or conversion to other uses.

Protected Lands in Charlemont

Approximately **55.7%** of Charlemont's total land area is considered open space with some level of protection from development. This includes both privately and publicly owned lands, and the protection status ranges from permanent to temporary safeguards.

Private Open Space
Privately owned open space in Charlemont includes farmlands, forestlands, and other lands with conservation restrictions. This open space is protected in various ways, such as through **Agricultural Preservation Restrictions (APR)** or **Conservation Restrictions (CR)**, or by being enrolled in Chapter 61 programs that provide temporary tax relief.

Privately Owned Open Space	Acres	% of Total Land Area in Charlemont
Farmland		
- Protected by Agricultural Preservation Restriction	714.09	4.3%
- Temporarily Protected Farmland under Chapter 61A	2,514.34	15.2%
Forestland		
- Protected by Conservation Restriction	390.45	2%
- Temporarily Protected Forestland (Chapter 61)	3,159.60	19.1%
- Temporarily Protected Forestland (Chapter 61B)	511.99	3%
Other Protected Land		
- Cemeteries	11.1	0.07%
Total Privately Owned Open Space with Protection	**7,301.51**	**44%**

Public Open Space
Publicly owned open space in Charlemont includes state-managed forestlands and lands owned by the town. This space is primarily protected by state conservation agencies like the **Department of**

Conservation and Recreation (DCR), but some town-owned land may have more limited protection, especially if it is under the authority of the Select Board rather than the Conservation Commission.

Publicly Owned Open Space	Acres	% of Total Land Area in Charlemont
Forestland		
- Protected by State Conservation Agencies	1,910.30	11.5%
Land with Limited Protection (Town of Charlemont)	31.10	0.2%
Total Publicly Owned Open Space with Protection	**1,938.95**	**11.7%**

Total Open Space with Protection

The total area of open space with some level of protection in Charlemont is **9,240.46 acres**, which represents approximately **55.7%** of the town's total land area.

Total Open Space with Protection	Acres	% of Total Land Area in Charlemont
Total	9,240.46	55.7%

These protected open spaces play a crucial role in preserving the town's natural resources, supporting local wildlife, and providing areas for recreation and public enjoyment. However, it is important to note that some lands are under temporary protection and may be subject to change, so continued vigilance and advocacy are necessary to ensure the long-term preservation of these valuable lands.

A.1. Privately Owned Agricultural Land

Agricultural land, including farm woodlots, makes up approximately **29%** of the privately owned open space in Charlemont that is under some level of protection from development. This represents about **21%** of the town's total open space and **9%** of Charlemont's entire land area. The following tables (5-2 and 5-3) provide details on the privately owned agricultural land in Charlemont, highlighting properties that are protected from development, as well as the size, ownership, and management of these lands.

Table 5-2: Privately Owned Agricultural Land Protected from Development in Charlemont

Location	Holder of the Conservation Restriction	Map	Lot	Acres	Value
Legate Hill Road	Franklin Land Trust	12	59, 60	100	Prime Farmland Soils
Route 2 and Tower Rd.	Department of Agricultural Resources	6	19.1, 20	46.85	Prime Farmland Soils
Route 2	Department of Agricultural Resources	4	83	440	Agricultural Use

Location	Holder of the Conservation Restriction	Map	Lot	Acres	Value
Warner Hill	Department of Agricultural Resources	13	9	80.24	Agricultural Use
Route 2	Department of Agricultural Resources	7	19, 20	38	Agricultural Use
Hicks Road	Department of Agricultural Resources	12	68	9	Agricultural Use
Total				**714.09**	

Approximately **10%** of Charlemont's agricultural land, with some level of protection, is permanently safeguarded through the **Agricultural Preservation Restriction (APR) Program**, administered by the Massachusetts Department of Agricultural Resources. These properties are protected against development and are maintained for agricultural purposes. The protected agricultural land in Charlemont is shown in Table 5-2.

Land enrolled in the **Chapter 61A** program is considered **temporarily protected**. This program offers landowners a reduction in property taxes if the land remains in active agricultural use. Nearly **90%** of Charlemont's farmland, including valuable **prime farmland soils**, is enrolled in Chapter 61A (see Table 5-3). While this land is not permanently protected, it is still safeguarded from immediate development and often helps preserve agricultural uses over time.

In some instances, farmland enrolled in Chapter 61A is located adjacent to land that is permanently protected under the APR program. While this temporary protection is valuable, conversion of even a small portion of these lands to residential development could threaten the viability of farming in the area. Residential developments near active farming operations often result in conflicts between farmers and new homeowners, particularly concerning noise, dust, and odors associated with agricultural activities. Additionally, increased traffic on rural roads can hinder farmers' ability to move equipment or manage their crops effectively.

Table 5-3: Privately Owned Agricultural Land Enrolled in Chapter 61A in Charlemont

LOCATION	Map	Lot	Acres
West Hawley Road	1	1	17.00
West Hawley Road	2	6	3.50
West Hawley Road	2	8	11.50
West Hawley Road	2	13	13.80
South River Road	3	7.1	46.50
Route 2	3	25	5.82
Route 2	3	26	1.70
Avery Brook Road	4	14	14.09
Route 2	4	36	128.60
Route 2	4	37.3	45.38
West Oxbow Road	4	37.3	36.70
West Oxbow Road	4	54.1	13.93

LOCATION	Map	Lot	Acres
Route 2	4	61	14.30
Route 2	4	62	8.01
Route 2	4	82	221.54
Route 2	4	84	240.35
North River Road	4	84	39.40
Tower Road	6	19.1	26.35
Tower Road	6	20	17.50
Tower Road	7	1.1	27.50
Tea Street	7	19	15.90
Tea Street	7	20	20.52
Warfield Road	7	86.2	467.52
Riddell Road	7	93	15.25
Route 8A North	7	93	91.36
Harris Mountain Road	8	35.1	17.39
Harris Mountain Road	8	38	0.99
Avery Brook Road	9	6	31.13
Burnt Hill Road	9	19.1	76.62
Burnt Hill Road	9	19.2	34.40
West Oxbow	9	40.1	34.77
East Oxbow	9	44	58.50
East Oxbow	9	45	3.20
East Oxbow	9	46	48.20
East Oxbow	9	48	61.90
East Oxbow	10	4	35.00
East Oxbow	10	5	85.00
Laurel Lane	11	28	7.09
Laurel Lane	12	5	19.30
Legate Hill Road	12	60	54.50
Legate Hill Road	12	63	1.30
Hicks Road	12	68	207.74
Warner Hill Road	13	3	112.78
Warner Hill Road	13	12.1	22.85

LOCATION	Map	Lot	Acres
Total			**2,514.34**

Benefits and Stewardship

Even though farmland enrolled in Chapter 61A is only **temporarily protected**, it still provides significant value to Charlemont. These agricultural lands often feature **prime farmland soils** that should be preserved for long-term agricultural use. Additionally, these lands contribute to the local tax base and generate essential revenue, employment, and food products. Some landowners also allow access to their properties for recreational activities such as hiking or snowmobiling, providing further benefits to the public.

Landowners enrolled in Chapter 61A are typically committed to responsible stewardship, helping to preserve the rural character of Charlemont and contributing to the overall stability of the community. The continued protection of agricultural land—whether through permanent or temporary means—ensures that these lands will remain available for future generations, preserving the town's agricultural heritage and its sense of place.

A.2 Privately Owned Forested Land

In Charlemont, privately owned forested land represents a significant portion of the town's open space. Approximately 51 percent of the town's protected open space, or about 3,505 acres, is privately owned forestland. This is about 21 percent of the total land area of Charlemont. A portion of this forestland, totaling 390.45 acres, is protected under conservation restrictions held by the Franklin Land Trust.

Table 5-4: Privately Owned Forested Land Protected from Development

Location	Holder of the Conservation Restriction	Map	Lot	Acres
Potter Rd.	Franklin Land Trust	7	74	1.45
Hawk Hill Rd.	Franklin Land Trust	4	68	5.16
Maxwell Road	Franklin Land Trust	12	65-6	5.65
Maxwell Road	Franklin Land Trust	12	65-5	11.45
Maxwell Road	Franklin Land Trust	12	65	70.10
Maxwell Road	Franklin Land Trust	12	65-1	4.05
Maxwell Road	Franklin Land Trust	12	65-4	7.07
Warner Hill Road	Franklin Land Trust	13	16-1	111.60
Warner Hill Road	Franklin Land Trust	13	12-1	21.50
Warner Hill Road	Franklin Land Trust	13	12	40.00
Warner Hill Road	Franklin Land Trust	13	18	30.00
Warner Hill Road	Franklin Land Trust	13	30	5.00

Location	Holder of the Conservation Restriction	Map	Lot	Acres
Warner Hill Road	Franklin Land Trust	13	7	6.55
Legate Hill Road	Franklin Land Trust	12	42	41.00
Total				**390.45**

Source: Town of Charlemont Assessor's Records and Maps, 2024.

While a relatively small portion of Charlemont's forestland is permanently protected, much of the town's forestland benefits from temporary protection through the Chapter 61 tax abatement programs, which encourage landowners to maintain their properties as forested lands by providing tax incentives.

Of the temporarily protected forestland, 99 percent are enrolled in the Chapter 61 Forestry program, which focuses on forest management for timber production. The remaining 1 percent is enrolled in the Chapter 61B program, which is designed for lands preserved for recreational open space.

Table 5-5: Privately Owned Forestlands Temporarily Protected Under Chapter 61 Forestland Tax Program

Location	Map	Lot	Acres
West Hawley Road	2	6	91.00
West Hawley Road	2	13	151.20
Main Street	2	13	68.72
Main Street	3	26	103.00
Burrington Road	3	26	70.70
Route 2	3	26	93.62
Harris Mountain Road	3	64, 67	83.37
Route 2	3	64	62.00
Route 2	4	14	0.74
Avery Brook Road	4	14	4.66
Avery Brook Road	4	24.1	19.20
Route 2	4	26	63.30
Hawk Hill Road	4	62	5.58
Hawk Hill Road	4	68	5.16
Route 2	4	84	69.00
Todd Mountain Road	6	24.1	98.00
Ledge Lane	7	46	12.00
Legate Hill Road	7	46	22.09
Route 8A North	7	93	74.77
Harris Mountain Road	8	15	20.85
South Heath Road	8	15	15.42
South Heath Road	8	35.1	67.89

Location	Map	Lot	Acres
Center Heath Road	8	45	145.00
Avery Brook Road	8	45	26.85
Avery Brook Road	9	10	77.19
East Oxbow Road	9	49	12.63
East Oxbow Road	10	1	155.87
East Oxbow Road	10	3	68.52
Todd Mountain Road	11	28	362.11
Legate Hill Road	11	28	21.02
Laurel Lane	11	28	42.00
Legate Hill Road	12	5	277.20
Cherry Pierson Road	12	51	16.70
Legate Hill Road	12	51	45.50
Legate Hill Road	12	63	5.65
Maxwell Road	12	64.2	62.08
Maxwell Road	12	66	56.00
Maxwell Road	12	67	124.00
Maxwell Road	12	68	182.97
Warner Hill Road	13	2	38.00
Warner Hill Road	13	2	47.00
Warner Hill Road	13	12	116.71
Warner Hill Road	13	16.2	22.67
Warner Hill Road	13	17.1	17.33
Warner Hill Road	13	19	5.93
South Heath Road	13	25	2.56
Route 8A North	13	25	23.99
Route 8A North	13	28	1.85
Total			**3,159.60**

Source: Town of Charlemont Assessor's Records and Maps, 2024.

Table 5-6: Privately Owned Forestlands Temporarily Protected Under Chapter 61B Recreational Open Space Tax Program

Location	Map	Lot	Acres
Thunder Mountain Road	2	0	195.91
South River Road	3	7.1	32.93
West Oxbow	9	38	65.00
Hawk Hill	9	38	3.55

Location	Map	Lot	Acres
Hawk Hill	9	39	4.61
Hawk Hill	9	63	3.52
Potters Road Extension	7	46	17.10
Legate Hill	7	86.2	5.30
Riddell Road	7	91	21.20
South Heath Road	8	35.1	11.61
Harris Mountain Road	8	38	40.00
Maxwell Road	12	63	1.50
West Oxbow	4	58	28.26
Route 2	4	84	40.00
North River Road	4	84	31.00
Total			**511.99**

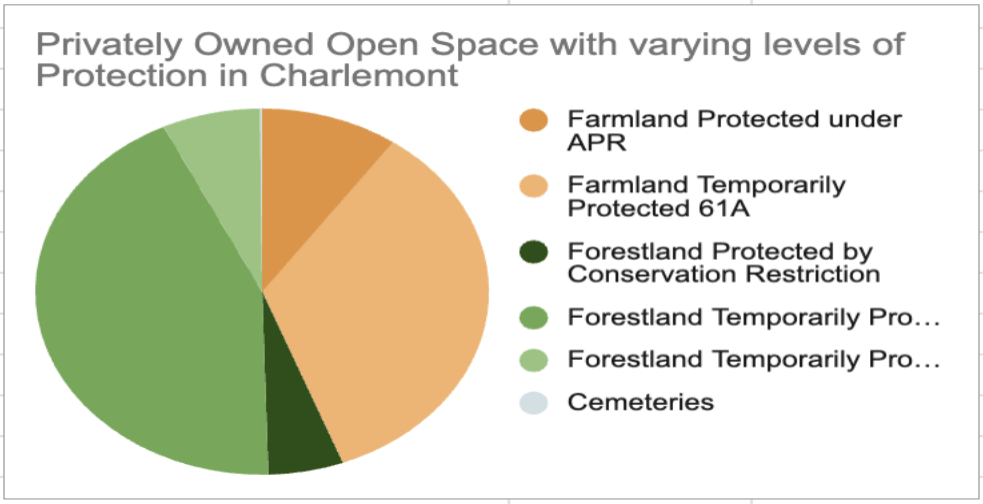
Source: Town of Charlemont Assessor's Records and Maps, 2024.

Importance of Privately Owned Forestlands

Privately owned forestlands in Charlemont provide a range of valuable ecological, economic, and recreational benefits. Large, intact forest tracts are crucial for maintaining wildlife habitats, preserving biodiversity, and supporting healthy ecosystems. These lands play an essential role in regulating water quality by filtering runoff and preventing soil erosion, while also promoting groundwater recharge. Forests contribute to the town's water resources by absorbing rainfall and slowly releasing water, reducing flood risks and maintaining streamflow during dry spells. By recycling nutrients, forests prevent excess runoff from contaminating local waterways, helping to preserve water quality. Additionally, the soils in these forests act as natural barriers against soil erosion, protecting the quality of fish habitats and ensuring the stability of riverbanks.

In addition to their environmental value, Charlemont's forestlands contribute to the local economy. Many of these lands are actively managed for timber production, providing jobs in logging, forestry, and wood processing. Locally harvested timber is used in construction, furniture making, and firewood, further supporting the local economy.

These forested lands also offer a variety of recreational opportunities, from hiking and wildlife viewing to hunting and snowshoeing. They contribute to the town's scenic beauty and rural charm, enhancing the quality of life for Charlemont's residents and visitors.



B. PUBLICLY OWNED PARCELS

Publicly owned protected open space in Charlemont constitutes approximately 28 percent of all the open space that has some level of protection in the town. Most of this land is protected from development and is managed by the Massachusetts Department of Conservation and Recreation (DCR). However, the town-owned parcels, totaling just 31 acres, offer limited protection because they are not under the jurisdiction of the Charlemont Conservation Commission. The following section inventories the publicly owned parcels in Charlemont, including those owned by the Commonwealth of Massachusetts and the Town of Charlemont.

B.1 Publicly Owned Open Space

Charlemont contains approximately 1,931 acres of publicly owned open space, which represents about 28 percent of the total amount of open space with some level of protection in the town and 11.5 percent of the town's total land area. Publicly owned open space in Charlemont is primarily comprised of lands managed by state conservation agencies, the Town of Charlemont, and the Hawlemont Regional School District. Most of these lands are forested or used for cemetery and recreational purposes.
The following tables outline the publicly owned open space in Charlemont.

Table 5-7: Publicly Owned State Land Protected from Development in Charlemont

Property Manager	Site Name	Acres	Map	Lot	Current Use	Recreation Value	Public Access
Division of State Parks and Recreation	Mohawk Trail State Forest	1,349.50	6	1	State Park	High	Good
Division of State Parks and Recreation	Mohawk Trail State Forest	357.14	6	1.1	State Park	High	Good
Division of State Parks and Recreation	North River Road	74.93	6	3.3	Recreation / Hiking	High	Good

Property Manager	Site Name	Acres	Map	Lot	Current Use	Recreation Value	Public Access
Division of State Parks and Recreation	North River Road	4.60	6	19	Swimming Hole	High	Not Good
Division of State Parks and Recreation	Tower Road	63.00	6	4.3	Hiking	Medium	Not Good
Division of State Parks and Recreation	Route 2	0.62	6	102	Boating Access	High	Good
Commonwealth of MA DOT	Route 2	9.40	7	35	River Access	High	Good
Commonwealth of MA DOT	Route 2	4.15	5	64	River Access	High	Good
Commonwealth of MA DOT	Tea Street	46.96	2	30	Hiking	Medium	Not Good
Total		**1,910.30**					

Source: Town of Charlemont Assessor's Records and Maps, 2024.

The Commonwealth of Massachusetts, through the Department of Conservation and Recreation (DCR), is the largest property owner in Charlemont, managing about 1,910 acres of land. This includes the well-known **Mohawk Trail State Forest**, located in the southwestern part of the town, which spans over 1,700 acres in total. The land is a major destination for outdoor recreation, including hiking, camping, swimming, and nature study, and is highly valued for its public access.

Additional state-owned lands in Charlemont include parcels along **North River Road**, **Tower Road**, and **Route 2**, which provide opportunities for hiking, river access, and swimming. Some of these areas are more remote and may have more limited public access or amenities, such as **Tower Road** and **North River Road (swimming hole)**.

Table 5-8: Town-Owned Land with Limited Protection from Development in Charlemont

Owner / Property Manager	Site Name	Acres	Map	Lot	Current Use	Condition	Recreation Value	Public Access
Town of Charlemont	Memorial Park	24.00	2	37	Fairgrounds	Fair	High	Good
Town of Charlemont / Hawlemont Regional School District	Hawlemont Athletic Fields	0.40	6.71	19	Athletic Fields	Good	High	Good
Town of Charlemont / Hawlemont Regional School District	Hawlemont Athletic Fields	6.71	85	85	Athletic Fields	Good	High	Good
Total		**31.11**						

Source: Town of Charlemont Assessor's Records and Maps, 2024.

The Town of Charlemont owns approximately 31 acres of land that are designated as open space, but these parcels offer limited protection from development. They fall under the authority of the Select Board, which can authorize their sale for development through a Town Meeting vote or other town processes. Memorial Park is the largest town-owned open space, functioning as a fairground and recreational area. The Hawlemont Athletic Fields are also town-owned and used for school and community sports activities. Both sites provide recreational opportunities with good public access.

Table 5-9: Cemeteries in Charlemont

Owner / Property Manager	Site Name	Acres	Map	Lot	Current Use
Leavitt Cemetery Trust	Leavitt Cemetery	8.65	3	27.1	Historical Cemetery
East Charlemont Cemetery Assoc.	East Charlemont Cemetery	1.54	4	42.1	Historical Cemetery
Village Cemetery Assoc.	Village Cemetery	0.92	19	73.1	Historical Cemetery
Total		**11.11**			

Source: Town of Charlemont Assessor's Records and Maps, 2024.

In Charlemont, cemeteries are maintained as protected open spaces, many of which are historical and offer quiet, preserved environments. They are sometimes used for passive recreational activities such as walking and birdwatching, contributing to the town's network of open spaces.

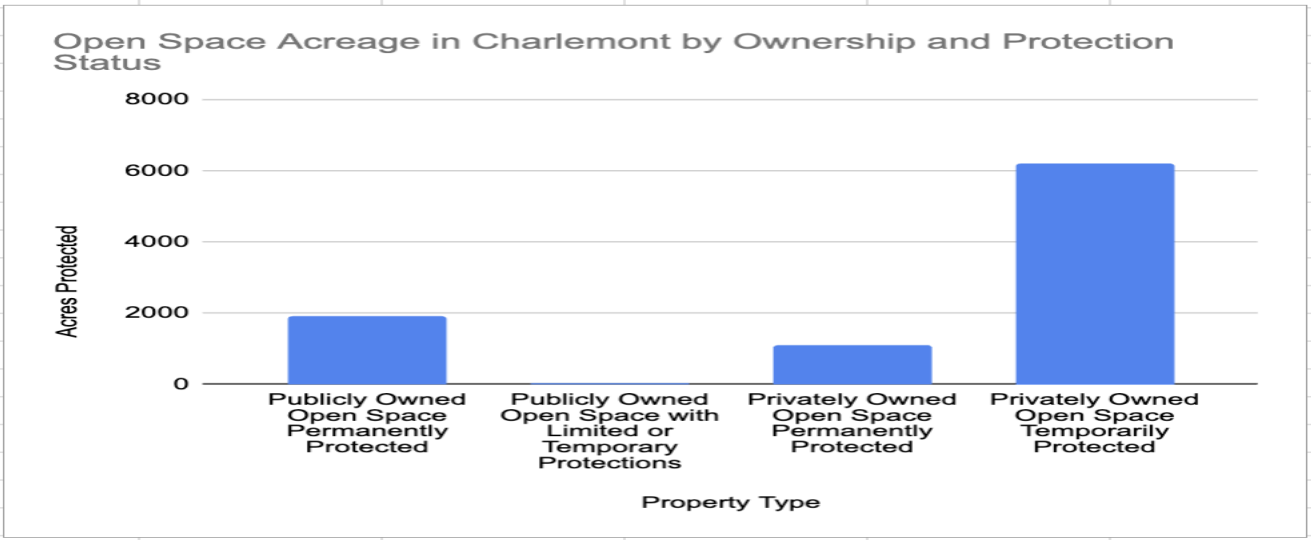
Summary

Charlemont has a total of 1,931 acres of publicly owned open space, which accounts for 28 percent of the town's total protected open space and 11.5 percent of the town's land area. The majority of this land is managed by the Commonwealth of Massachusetts, with the Department of Conservation and Recreation overseeing the **Mohawk Trail State Forest**, one of the town's largest and most accessible public open spaces. Other state-owned parcels along North River Road, Tower Road, and Route 2 also provide significant recreational opportunities.

The Town of Charlemont owns approximately 31 acres of land with limited protection, which is under the jurisdiction of the Select Board. This land, including Memorial Park and the Hawlemont Athletic Fields, is primarily used for recreational and community purposes.

In addition, Charlemont's cemeteries provide well-maintained, passive open spaces, some of which are suitable for light recreational activities.

Publicly owned open space in Charlemont offers valuable resources for residents and visitors, from recreational activities such as hiking and swimming to preserving the town's natural and historical heritage.


Open Space Acreage in Charlemont by Ownership and Protection Status
8000
6000
4000
2000
0
Acres Protected
Publicly Owned Open Space Permanently Protected
Publicly Owned Open Space with Limited or Temporary Protections
Privately Owned Open Space Permanently Protected
Privately Owned Open Space Temporarily Protected
Property Type

SECTION 6

COMMUNITY GOALS

A. DESCRIPTION OF PROCESS

The Town of Charlemont's open space and recreation goals were updated through the following processes and timeline:

Date(s)	Activity	Description
8/16/24	Project team meeting; Initial Planning	Town Administrator and Planning Board Member met to discuss the current OSRP, update requirements, and desired timeline.
9/12/24	OSRP Survey distributed	Survey access information shared with general public via QR code, url, and paper copies. Survey can be found in Appendix
9/26/24	Project team meeting	Collaborative planning and meeting prep
9/30/24	Public Meeting 1	Introduction to current OSRP and requirements for update.
10/28/24	Public Meeting 2	Public comment and feedback on 2004 OSRP, especially the goals, objectives, and action items. Draft of 2025 goals, objectives and action items developed during meeting.
11/18/24	Public Meeting 3; All-board meeting	
11/19/24	Project team meeting	Collaborative planning and editing
12/3/24	Project team meeting	Collaborative planning and editing
12/12/24	Public Meeting 4	
1/27/25	Public Meeting 5	

B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS

Residents recognize that the economic vitality of Charlemont is dependent on the ecological integrity of its watersheds and on the retention of its historical and naturally scenic agricultural landscapes. They value its diverse terrain, which includes a mix of working farms, extensive forests, steep hillsides and the Deerfield River floodplain. They like living in a town with clean air and water and a great diversity of native plants and animals, that is relatively safe from crime and vandalism, has affordable housing, and offers abundant opportunities for outdoor recreation.

Residents who have participated in past planning processes and in the development of this Open Space and Recreation Plan update, have a vision for the future of Charlemont's natural, historical, and recreational resources. In this vision, the town's large blocks of forests, sensitive wildlife habitat areas, and active farmland are protected as a result of cooperative efforts between private landowners, and local and state agencies and private non-profit organizations. The town has funds to support local farmers applying to protect their land through the Agricultural Preservation Restriction Program. Most protected lands have remained in private hands and control, and continue to contribute property taxes. The town has protected land along the Deerfield River to protect public access to its waters as well as some of the finest scenic views in town. Residents continue to enjoy clean drinking water from sources and aquifers that have been protected from contamination.

In this vision for the future, Charlemont has a diverse local economy anchored by existing recreational-based tourism firms. Farmers and wood producers link forces with local retailers taking advantage of the tourist traffic along Rte. 2. Residents speak proudly of their successful efforts to maintain and restore historic buildings in each of the villages, but especially in the Center. Charlemont Center continues to thrive as the commercial and civic center.

Residents of all ages and abilities enjoy access to the Deerfield River via the town-owned beach and waterfront park as well as to a system of well-maintained trails, most of which are on private property. Town officials and trail enthusiasts are successful at organizing and facilitating trail use among residents to only those trails open to the public with the express permission of the landowners. Using the success of the Deerfield River Impact Committee to facilitate the adoption of safety policies by all types of recreational users of the river, residents have developed a protocol for private property trail use that was adopted town wide. The resulting pedestrian and biking trails provide an alternative mode of transportation to residents between villages, recreational amenities offered by local tourism-based businesses, and a source of customers of local farmers road-side stands.

SECTION 7

ANALYSIS OF NEEDS

The Charlemont Open Space and Recreation Plan incorporates the inventory of all the land-based natural, scenic, and cultural resources that are available in town (Section 4), identifies the areas that contain these resources (Section 5), and based on the community's general goals (Section 6), makes comparisons between the supply of resources and the demand (Section 7). In the following three subsections, the most important environmental issues are highlighted (Summary of Natural Resource Protection
Needs), the recreation and open space needs of the residents are discussed (Summary of Community's Needs) and the obstacles to the effective resolution of these needs are addressed (Management Needs).

A. SUMMARY OF NATURAL RESOURCE PROTECTION NEEDS

Charlemont residents value their town's natural environment including the Deerfield River, clean drinking water, working farms and forests, diverse wildlife habitats, and scenic views. They appreciate the economic opportunities that the river and surrounding hills provide and understand that only through careful management of human impacts can the ecological, historical, and scenic integrity of its landscapes remain for the future.

According to results of the planning in which the residents invested between 1998 and 2003, the main natural resource protection needs facing Charlemont include: 1) protecting the Deerfield River from potential contamination; 2) contributing to the retention of farm and forest-based businesses; 3) managing the impacts of tourism on river quality; and, 4) ensuring that large blocks of contiguous forest are conserved despite future residential development.

Protecting the Deerfield River

In many ways the Deerfield River represents the heart and soul of Charlemont. Unlike other communities along its course, Charlemont's local economy owes its growth, fortitude and resilience to the river's continuous ability to attract visitors from whitewater enthusiasts and anglers. The town's residents and business owners continue to utilize the commercial opportunities presented by this flow of capital. Therefore, it is imperative for the town to continue to use its influence locally and within the watershed to reduce the negative impacts to the river from pollutants and from its use by PG&E to generate power.

All forms of erosion and pollutants throughout town ultimately arrive in the Deerfield River. Therefore, most of the problems associated with the Deerfield River are also issues for the many tributaries that flow into the main stem. All of the issues identified as environmental problems in Section 4 G need to be addressed by the town to ensure the quality of the Deerfield is enhanced over time:

- Work with the Deerfield River Watershed Association and continue to monitor the polluted Davis Mine Brook.
- Talk with MassHighway, District 1 to negotiate an alternative to the current road salt to sand mix and consider funding the extra costs of applying hops instead of salt along the Deerfield and along areas with known aquifers.
- Work with the Board of Health to identify locations of car dumps and ensure through soil and water tests that these areas pose no immediate threat to groundwater quality.
- If not properly engineered or maintained, gravel roads can erode in any number of ways resulting in detrimental sediment loading in abutting wetlands. A number of solutions are known to fix site-specific problems as well as help to ensure a minimum of erosive flow per storm event along the entire gravel road network.
- Town officials need to continue to work in partnership with other towns and the Council of Governments to address the regional issues of right-of-way vegetation management as it relates to pesticide use and of hazardous material transport along rail sections with documented failures.
- The town also needs to continue to work with MassHighway to impact factors within their control (e.g., tree planting and commercial development), which could result in the slowing of traffic along Rte. 2.
- To reduce trash and litter in a community that caters to out-of-towners we have implemented a fine for alcohol on the river and will continue to pursue cleanup.
- The town has been pursuing grant funding and low interest loans to upgrade private septic systems that do not currently comply with Title V.

Retaining Farm and Forest-based Businesses

There are several examples of programs and services that farmers can participate in to upgrade their business plans (The Farm Viability Enhancement Program (FVEP)), to pass on their farms to the next generation (estate planning and land protection services offered by land trusts, land lawyers, and UMass Extension), or to increase their marketability (CISA's Be A Local Hero campaign). Forest landowners can belong to cooperatives and work with consulting foresters if they so choose.

The Charlemont Agricultural Commission is currently surveying farmers and wood producers what government can do to assist land-based businesses to become more profitable despite dynamic markets and increasing fixed costs. One way government and non-profits have assisted private agricultural enterprises is through the promotion of

locally grown farm and niche forest-based products to tourists and residents of the region.

Managing the Impact of Tourism on Environmental Quality of the Deerfield River

The town continues to enact the recommendations of the Deerfield River Impact Committee to manage the impact of summer recreational use of the river:

- Charlemont has developed a public safety map of the River showing or describing river access points, river hazards, river safety precautions. Additional public maps are in development.
- Work with the Towns of Florida and Rowe to implement a consistent plan throughout the three towns.
- Establish a car count on Zoar Road weekday/weekend, summer and fall.
- Consult with outfitters, Deerfield River Watershed Association, the Power Company and others to determine appropriate information and content, and to help find grants to implement projects.

Ensuring that Large Blocks of Contiguous Forest are Conserved Despite Future Residential Development

According to a recent geographic information systems (GIS) analysis of large forest blocks in Franklin County developed by the FRCOG Planning Department (2003), Charlemont and Heath contain one of the largest blocks of contiguous forest in West County. Large blocks of contiguous forest protect habitat, drinking water supplies, wetlands and plant and animal biodiversity. Along with the Deerfield River and farmland, large blocks of undeveloped forest are an extremely important yet vulnerable component of Charlemont's rural character.

The current development trend in Charlemont and in the rest of the region is single family homes developed off of existing roads. As these frontage lots are developed around town, two things may occur: 1) farmland, which is typically located next to roads will continue to be targeted for development, and 2) most of the land occupied by residential development in town will remain within road corridors as it is today until it becomes profitable to develop back land. Based on Charlemont's current zoning the only constraints to developing back land are slope and soil conditions, which can be overcome over time through changes in technology and on-site septic system regulations.

[Include a paragraph here about bringing some areas of town up to code for focused development?]

Charlemont officials may want to consider revising their zoning and developing a more pro-active land conservation program to protect the town's rural character and in return,

its economic base. Even with the limitations of the Massachusetts Zoning Act, towns have the ability to apply zoning in thoughtful ways that encourage acceptable patterns of development through incentives. By setting aside money in the budget each year in a conservation fund, towns can have the capacity to facilitate the investment of federal, state, and private dollars to protect the most important forest habitat, the oldest farm, or the best scenic view of the Deerfield River, if they become available.

The town could use the Natural Heritage and Endangered Species Program's BioMap as a means of identifying forests to prioritize for protection ~~(*see Open Space Map*)~~. If town officials were to use presence of a Core Habitat Area or Supporting Natural Landscape, as significant criteria in their prioritization process, several areas in town would be highlighted: Core Habitat forests are located north of the Deerfield River, near the confluences of Pelham Brook and Todd Brook; between Hartwell Brook and Avery Brook; and straddling an unnamed brook in the eastern section of town. Forests that provide Supporting Natural Landscapes in town buffer Core Habitats, surround Legate Hill and Patch Brook from the Deerfield River north to Rowe, and encapsulate the residential subdivision of Hawk Hill Road and Deer Run Lane.

B. SUMMARY OF COMMUNITY'S NEEDS

Planning for a community's open space and recreation needs must satisfy the present population's desires for new facilities, spaces, and services, and also must interpret and act on the available data to prepare for the future needs of Charlemont residents. Although the Charlemont Open Space and Recreation Plan will be updated in five years, the types of actions identified in Section 9 will take into account the needs of the next generation as well.

Past comprehensive planning processes in 1998 and 2002, as well as the Open Space and Recreation Meetings and discussions at Open Space Committee meetings, helped to identify several community needs relating to open space and recreation resources: develop the Charlemont Fairgrounds as a public space; additional recreational programming for all ages; safe pedestrian and bicycle paths between village centers; acquiring a town-owned river front parcel to be used as a public beach; protecting scenic views along the Mohawk Trail from poorly planned development; and, promotion of existing hiking and biking trails.

Develop the Charlemont Fairgrounds

- Upgrade facilities, parking, and wayfinding
- Include public internet access

Additional Recreational Programming for all Ages

Small towns interested in increasing the amount of recreational programs available to children, adults, and seniors have four main options: funding the programs themselves, depending on volunteers, providing programs in collaboration with other towns, or a combination of the first three. Library programs might best be funded through town appropriations and grants. Volunteers already organize and lead recreational events and programs including the Charlemont Forum, the Mohawk Concert series, ~~Scouts,~~ pickleball, adult enrichment programs, a children's ski program, and 4-H. With ample year-round recreational opportunities in town, the limiting factor may be the lack of facilitators. Some towns have active Recreation Committees that are responsible for running a set number of events per year. Charlemont officials might consider working with other towns like Hawley and Heath to hire a part time recreation coordinator. This organization could coordinate the efforts of volunteers, attract state and federal grants to develop and maintain recreational facilities, and organize and produce recreational and communitywide events for residents year-round.

Safe Pedestrian and Bicycle Paths Between Villages and Shelburne Falls

Residents have long voiced a desire to have pedestrian and bicycle trails connecting some of the villages in Charlemont. This is not surprising given Rte. 2 is the only east-west transportation route between Zoar and East Charlemont. The Town of Erving is in a very similar predicament. Erving's Open Space and Recreation Plan recommended the development of a trail across the Millers River in Wendell that would connect Erving Center with Farley, two of the town's three villages. Charlemont on the other hand enjoys a wider floodplain in most cases than the Millers River offers Erving.

Road right-of-way bike paths might be more easily designed and implemented than a shared road lanes, especially on Rte. 2. Even so, permanent path systems are likely a long-term project dependent in large part upon the presence of leadership. There needs to be a person or persons willing to move the project from beginning to end, independent of town staff.

Developing a Town Beach Parcel

Identify access to the Deerfield River for swimming, fishing, boating, and other recreational activities is an ongoing desire for residents. As a first step, the Select Board could resurrect the Economic Roundtable to work with the Selectboard to determine next steps.

Protecting Scenic Views along the Mohawk Trail

The 2003 Mohawk Trail Scenic Byway Corridor Management Plan grades areas along Rte. 2 from Greenfield to Williamstown by their scenic value relative to the entire roadway. Within Charlemont, the results of the landscape and visual assessment show that most of the Rte. 2 corridor between East Charlemont and Rowe is comprised of "Outstanding" scenic values, the highest standing considered in the assessment. Two of the three sections of the Mohawk Trail in Charlemont containing scenic viewsheds look upon privately owned farmland and open land on both sides of the Deerfield River, while a third looks west from Rte. 2 to Mohawk State Forest. The action plan strategies that may be most effective at protecting viewsheds that include mostly privately-owned farmland include:

- Pursue funding to purchase scenic easements, farmland preservation restrictions to protect scenic vistas and agricultural lands.
- Work with local farmers to increase the economic viability of their farms including promotion of locally grown products.
- Revisit zoning bylaws including review of allowed uses and densities, establishment of a byway corridor overlay district, and review of site plan approval process and criteria.

Promote Existing Hiking and Biking Trails

To create a map and promote existing trail systems that take advantage of historical highways and Native American trade routes, town officials might begin by organizing a well-represented trails committee. The purpose of the committee would be to develop a coordinated plan for trail promotion in town. The plan could be a long-term action-based plan, which would require the collaboration of willing private landowners, and would focus on the trails they support the most.

C. MANAGEMENT NEEDS

The main challenge for Charlemont town officials in providing for natural resource and community needs may be to effectively use consensus building and collaboration to accomplish both short and long-term projects. The following needs can all be expressed as projects:

- Protecting the Deerfield River (from improper land uses);
- Retaining farm and forest-based businesses;
- Managing the impact of tourism on environmental quality of the Deerfield River;
- Ensuring that large blocks of contiguous forest are conserved;
- Develop the Charlemont Fairgrounds;
- Additional recreational programming
- Safe pedestrian and bicycle paths between villages;

- Acquiring a town beach parcel; and,
- Promote existing public use hiking & biking trails.

Most of the items listed above are long-term projects that may have many action steps to be completed over the next decade. Each project can be accomplished by a committee with a leader appointed by the Select Board. By authorizing several committees each year via warrant articles at Town Meeting, volunteers won't be overburdened and the voters will feel more ownership for the community overall. In each case, the overall goal of the committee will have been chosen in part at its formation at Town Meeting. The objectives, how the purpose of the committee gets realized, is up to the members of the committee and to the residents who participate in the meetings. Through the public meeting process different view points get expressed and ultimately result in a draft plan that can be presented for wider discussion and input on the town web site, at Town Meeting, or at a special presentation.

Meeting goals such as protecting the Deerfield River, retaining farm and forest-based businesses, developing the Fairgrounds, and protecting large blocks of forest, will require town committees to collaborate with regional and statewide agencies and organizations. Town officials need to continue to build relationships with Franklin Land Trust, Trustees of Reservations, the Deerfield River Watershed Association and state agencies and offices including UMass Extension, the Executive Office of Environmental Affairs, the Division of Conservation Resources, MassHighway, and the Department of Environmental Protection. Other townwide needs will require town committees and boards to collaborate with each other, which may require more multi-board meetings to facilitate the goals outlined (*see Section 9*).

SECTION 8

GOALS AND OBJECTIVES

The Charlemont Open Space and Recreation Plan Goals and Objectives were formulated from feedback received during public meetings, emails from residents, and survey responses. Although the responses recorded may not reflect the opinions of *all* residents, in sum they do represent a significant source of community input, which was used to identify the open space and recreation resources most important to Charlemont residents.

1. **Goal: Ensure that Charlemont maintains its small-town rural atmosphere characterized by both rural and village land use patterns, community spirit, and an abundance of recreational opportunities.**

   Objectives:
   a. Encourage land use and development patterns that preserve rural character, recreation, open space, water resources, and agricultural lands in Charlemont.
   b. Maintain and promote the village as the economic center of the town.

2. **Goal: Ensure that the Town of Charlemont improves, maintains, and promotes the quality and accessibility of all of its recreational and historic areas, facilities, and programming for both residents and tourists, including access to the Deerfield River, forests, fields and unbroken trails.**

   Objectives:
   a. Develop the fairgrounds as a public space. Promote their use for public events like farmers' market, concerts, and communal festivities.
   b. Increase year-round recreational opportunities for residents of all ages.
   c. Create a comprehensive map of recreational opportunities, for example: trails, businesses, parking, recreational facilities, etc...
   d. Provide safe and adequate bike and pedestrian path connections in town (e.g. between Charlemont Center and the Fairgrounds and along Zoar Road).
   e. Assess the status of buildings and structures located within the Charlemont National Historic District and in other areas of town.

3. **Goal: Ensure that the Town of Charlemont maintains or improves the quality of its surface and ground waters including the Deerfield River and its associated aquifers, agricultural landscapes, scenic views, and the diversity and integrity of native plants and animals through the conservation of locally important natural and open space resources.**

   Objectives:

a. Identify, improve and protect scenic viewsheds, especially along Rt.2 and along the Deerfield River
b. Pursue the protection of natural resources including prime farmland soils, groundwater resources, large blocks of contiguous forestland, active farms, and priority habitats within the Deerfield River valley.
c. Support local agriculture to strengthen the long-term viability of agricultural businesses and to help ensure the retention of the town's most significant scenic and historic agricultural landscapes.
d. Identify and support opportunities which encourage current and future generations to be inspired by and involved in Charlemont's unique past, present, and future.

SECTION 9

FIVE YEAR ACTION PLAN

The Five-Year Action Plan is intended to provide concrete steps towards implementing the objectives of the Open Space and Recreation Plan. The Open Space and Recreation Planning Committee developed the draft action steps outlined below.

The objectives are listed in the far left column of the foldout Table 9-1 in the same order as they appear in Section 8. They are followed in the same row by recommended actions, the board or group responsible for implementation, and start dates. By implementing the recommended actions, each of the objectives will begin to be realized.

Successful implementation will require the participation of existing town boards, committees and staff, including but not limited to the Board of Selectmen, Planning Board, Conservation Commission, Historical Commission, Community Development Committee and others.

Accomplishing the actions identified in this section will require time and commitment from dedicated volunteers. Where money is required, it may be sought from state and federal governmental agencies, private non-profit conservation agencies, foundations, and individual donations in addition to municipal funds. A broad base of community support for the Open Space and Recreation Plan should facilitate fundraising to achieve its goals and objectives.

Table 9-1: Recommended Action Steps to Implement the Charlemont Open Space and Recreation Plan

Goal 1: Ensure that Charlemont maintains its small-town rural atmosphere characterized by both rural and village land use patterns, community spirit, affordable housing, and an abundance of recreational opportunities.			
Objective	**Action**	**Responsible Board/Group**	**Start Date**
Encourage land use and development patterns that preserve rural character, recreation, open space, water resources, and agricultural lands in Charlemont.	Collaborate with the Planning Board to continue to amend the town zoning bylaws to promote desirable development patterns.		

Table 9-1 continued

	Promote development patterns that sustain the quality of the region's agricultural, natural, cultural, and recreational resources on all levels (local, regional, state, federal etc..)		
	Explore grants and initiate a new Build Out Analysis.		
Maintain and promote the village as the economic center of the town.	Pursue the development of the Visitors Center/Museum in Charlemont Center.		
Goal 2: Ensure that the Town of Charlemont improves, maintains, and promotes the quality and accessibility of all of its recreational and historic areas, facilities, and programming for both residents and tourists, including access to the Deerfield River, forests, fields and unbroken trails.			
Objective	**Action**	**Responsible Board/Group**	**Start Date**
Develop the fairgrounds as a public space. Promote their use for public events like farmers' market, concerts, and communal festivities.	Pursue any and all grant opportunities relevant to the fairgrounds		
	Request the Park Commissioners to have regular, posted, and scheduled, public meetings.		
	Encourage Fairground Committee to create calendar/website for public visibility into events going on at the fairgrounds.		

Table 9-1 continued

	Develop a location for the Town Beach on the Deerfield River		
Increase year-round recreational opportunities for residents of all ages.	Explore the development of a Pump track and other family friendly recreational facilities at the Fairgrounds		
	Improve tennis and basketball courts and add pickleball lines at Hawlemont for open public use.		
	Explore the development of a trail from Charlemont Village to the Fairgrounds.		
Create a comprehensive map of recreational opportunities, for example: trails, businesses, parking, recreational facilities, etc...	Categorize, plot, and promote recreational opportunities through creation of a public map and resources		
Provide safe and adequate bike and pedestrian path connections in town (e.g. between Charlemont Center and the Fairgrounds and along Zoar Road).	Encourage the Select Board to continue to work with relevant parties on improvements to recreation access.		
Assess the status of buildings and structures located within the Charlemont National Historic District and in other areas of town.	Continue to work with the Historical Commission on their goals and objectives		
Goal: Ensure that the Town of Charlemont maintains or improves the quality of its surface and ground waters including the Deerfield River and its associated aquifers, agricultural landscapes, scenic views, and the diversity and integrity of native plants and animals through the conservation of locally important natural and open space resources.			

Table 9-1 continued

Objective	Action	Responsible Board/Group	Start Date
Identify, improve and protect scenic viewsheds, especially along Rt.2 and along the Deerfield River	Identify the most important vantage points and explore opportunities for protection		
	Work to remediate and remove invasive species along the Deerfield River		
Pursue the protection of natural resources including prime farmland soils, groundwater resources, large blocks of contiguous forestland, active farms, and priority habitats within the Deerfield River valley.	Acquire funding to purchase Agricultural Preservation Restrictions and Conservation Restrictions so that more of the town's remaining farmland and Priority Habitats can be conserved for future generations.		
	Consider zoning amendments for the Deerfield River valley, which would help protect natural and agricultural resources.		
	Appoint a Charlemont Open Space Committee to ensure the successful implementation of the town's Open Space and Recreation Plan.		
	Meet with and encourage the Finance Committee to resume contribution to the APR match fund every year.		

Table 9-1 continued

	Seek funding from federal, state, and private sources to protect remaining farm and forestland in town as the opportunities arise.		
	Identify areas of land that contain the most critical resources (prime farmland soils, aquifers, contiguous forests, land that provides public access to the Deerfield River, BioMap core habitat, and Living Waters core habitats (special aquatic habitats)), to enable the town to be able to prioritize which lands would be most important to protect from development were they to become available.		
Support local agriculture to strengthen the long-term viability of agricultural businesses and to help ensure the retention of the town's most significant scenic and historic agricultural landscapes.	Promote locally grown and made products		
Identify and support opportunities which encourage current and future generations to be inspired by and involved in Charlemont's unique past, present, and future.	Identify and develop inroads with educational institutions/programs through learning opportunities that engage in Charlemont's unique geologic landscape, agricultural and recreational culture, and diverse heritage.		

SECTION 10

PUBLIC COMMENT

SECTION 11

APPENDIX

REFERENCES

American Farmland Trust Information Center. Summary Cost of Community Service Studies Fact Sheet. 1991.

Chief Plant Operator. Town of Charlemont Sewer District. Personal Communication. 2003.

Commonwealth of Massachusetts Department of Environmental Protection, Bureau of Waste Prevention. Personal Communication. 2003.

Commonwealth of Massachusetts Department of Environmental Protection, Division of Watershed Management. 314 CMR 4.00: Massachusetts Surface Water Quality Standards. 2000.

_____. Deerfield River Watershed 1995 Assessment Report for Review. 1996.

_____. Massachusetts Section 303(d) List of Waters. Worcester, Massachusetts. 1998.

_____. Massachusetts Year 2002 Integrated List of Waters. 2002.

Commonwealth of Massachusetts Department of Housing and Community Development. Community Profile - Town of Charlemont. Website. 2003.

Commonwealth of Massachusetts Division of Fisheries and Wildlife. Classification of Massachusetts Palustrine Natural Communities - Draft. 2000.

_____. Massachusetts Trout Stocked Waters. 2001.

Commonwealth of Massachusetts Division of Fisheries and Wildlife. Natural Heritage & Endangered Species Program. BioMap Initiative. 2003.

_____. Correspondence. 2002.

_____. Fact Sheets on Species of Special Concern, Rare and Endangered Wildlife, and Threatened Plants in Charlemont, Massachusetts. 2003.

_____. Massachusetts Aerial Photo Survey of Potential Vernal Pools. 2001.

_____. Natural Heritage Atlas. 2003 Edition.

Commonwealth of Massachusetts Division of Employment and Training. Employment and Wages in Charlemont. 2002.

_____. Local Area Unemployment Statistics. 2002.

Commonwealth of Massachusetts Executive Office of Environmental Affairs. Deerfield River Watershed. Website. 2003.

_____. The Open Space Planner's Workbook. 2001.

Commonwealth Research Group, Inc. Cost of Community Services in Southern New England. Executive Summary. Commissioned by Southern New England Forest Consortium, Inc. Chepachet, Rhode Island. 1995.

Deerfield River Watershed Association. Website. 2003.

DeGraaf, Richard M., Mariko Yamasaki, William B. Leak, and John W. Lanier. New England Wildlife: Management of Forested Habitats. Northeast Forest Experiment Station. Radnor, Pennsylvania. 1992.

Department Landscape Architecture and Regional Planning, Studio IV. A Foundation for an Open Space and Recreation Plan for Orange, Massachusetts. 1996.

Eyre, F. H. (ed.) Forest Cover Types of the United States and Canada. Society of American Foresters. Washington, D.C. 1980.

Forman, Richard T.T. Land Mosaics: The Ecology of Landscapes and Regions. New York: Cambridge University Press. 1995.

Franklin County Chamber of Commerce and County Commissioners of Franklin County. State Forests and Parks in Franklin County. No date.

Franklin County Commission. The Franklin County Rural Historic Landscape Preservation Plan. 1992.

Franklin County Planning Office. Preliminary Data Report: Deerfield River Management Plan. 1989.

Franklin Regional Council of Governments. The Greater Franklin County Region Comprehensive Economic Development Strategy. 2000, 2002.

_____. Regional Policy Plan. 1998.

_____. Town of Charlemont Build-out Analysis. 2001.

Franklin Regional Council of Governments and Berkshire Planning Commission. Mohawk Trail Scenic Byway Corridor Management Plan. 2002.

Healy, Allan. Charlemont, Massachusetts: Frontier Village and Hill Town. Ashfield, Massachusetts: Paideia Publishers. 1986.

Hines, J. Commonwealth of Massachusetts Department of Agricultural Resources. Personal Communication. 2003.

Holm, Lass, Rogers. The Changing Landscape of Massachusetts Agriculture. Massachusetts Benchmark. Winter 1999 - 2000.

Hornbeck, J. and W. Leak. Ecology and Management of Northern Hardwood Forests in New England. 1991.

Hubbard, R. Commonwealth of Massachusetts Department of Agricultural Resourcs. Personal Communication. 2003.

Journal of Forestry. Ecosystem Management: Capturing the Concept for Woodland Owners. 1998.

MacArthur, R.H. and E.O. Wilson. The Theory of Island Biogeography. Princeton University Press. 1967.

Massachusetts Association of Conservation Commissions. Environmental Handbook for Massachusetts Conservation Commissioners. 1991.

Massachusetts Audubon Society. Groundwater Information Flyer #1. 1985.

Massachusetts Department of Public Health, Bureau of Environmental Health Assessment. Freshwater Fish Consumption Advisory List. 1998.

Massachusetts Geographic Information System. 1985 and 1999 Land Use Data. 2003.

Massachusetts Historical Commission. Town of Charlemont Inventory Forms. Various dates.

_____. Reconaissance Survey Report for Charlemont. 1982.

Massachusetts Institute of Social and Economic Research. Population Projections. 1999.

_____. 1997 MISER Population Age Breakdown. 1999.

_____. 1990 Census Population Age Breakdown. 1999.

_____. Estimates of Population Age Breakdown. 1999.

Masters, Gilbert. Introduction to Environmental Engineering and Science, Second Edition. 1998.

Mingori, C. and H. King. The Deerfield River Watershed: Landscape, Lifeform and Human Impact. 1994.

Massachusetts Natural Heritage and Endangered Species Program and The Nature Conservancy. Our Irreplaceable Heritage: Protecting Biodiversity in Massachusetts. 1998.

RKG Associates. Charlemont Master Plan. 2002.

Salvatore, Lawrence. MassHighway. Personal Communication. 2002.

Slater, C. Anadromous Fish Restoration in Massachusetts. Connecticut River Salmon Association Newsletter. Winter 2001-2002.

Szocik, C. Commonwealth of Massachusetts Department of Agricultural Resources. Personal Communication. 2003.

Town of Charlemont. Assessors Records and Maps. 2003.

_____. Zoning By-Law. 1999.

Town of Charlemont. Selected Employers with Greater than Ten Employees. Personal Communication. 2003.

U.S. Bureau of the Census. Census 2000 Population Data. 2001.

_____. Census 2000 General Demographic Characteristics. 2001.

_____. Census of Population and Housing. 1990, 2000.

_____. County Business Patterns Massachusetts. 1990, 1998.

_____. Franklin County Poverty Status. 2000.

_____. Per Capita and Median Household Income. 2000.

_____. Place of Work. 1990, 2000.

_____. U.S. Census of Population. 1970, 1980, 1990.

United States Department of Agriculture. Natural Resources Conservation Service. National Soil Survey Handbook. 2001.

United States Department of Agriculture Soil Conservation Service. Soil Survey Franklin County Massachusetts. 1967.

United States Department of Housing and Urban Development, Federal Insurance Administration. Flood Insurance Rate Map – Town of Charlemont, Massachusetts. 1980.

United States Environmental Protection Agency. Environmental Protection Agency Region 5 and Agricultural and Biological Engineering at Purdue University. Groundwater Primer, Version 1.0. Website. 1998.

University of Massachusetts Cooperative Extension Service. Natural Resource Inventory for Franklin County, 1976.

University of Massachusetts. Department of Landscape Architecture and Regional Planning, Center for Rural Massachusetts. Charlemont Master Plan Background Document. 1998.

Walk, MF. Deerfield River Volunteer Monitoring Program, 2002 Final Report. 2002.

Walker, G. Text for Section 4, G.3, Threats to the Ecological Integrity of the Deerfield River. No date.

Wilson, E.O. and E.O. Willis. "Applied Biogeography," in Cody, ML and JM Diamond, editors, Ecology and Evolution of Communities. Belknap Press, Cambridge, Massachusetts. 1975.

Zenick, M. Franklin Land Trust. Personal Communication. 2003.

Table A-1: Historic Structures and Sites in Charlemont

MHC Inventory #	Street Name	Historic Name	Common Name	Year	Style
901	Burrington Rd.	Old Oak Tree Monument		1893	
919	Burrington Rd.	Kinney Lower Bridge	Burrington Road Bridge over Hartwell Brook	1920	
314	Davis Mine Rd.			1850	Federal
315	Davis Mine Rd.			1850	Not researched
316	Davis Mine Rd.	Porter, Levi M. House		1743	Greek Revival
917	Deerfield River	Development #4 Hydroelectric Station Gravity Dam		1912	
918	Harris Mountain Rd.	Mill Bridge - Meekins Bridge	Harris Mountain Road Bridge over Mill Brook	1939	
15	High St.	Richards, J. N. House		1825	Federal
27	High St.	Mayhew, Charles House		1840	Greek Revival
28	High St.	Warner, C. House		1850	Greek Revival
28	High St.	Warner, C. House		1850	Victorian Eclectic
50	High St.	Mayhew, George House		1835	Federal
50	High St.	Mayhew, George House		1835	Greek Revival
57	High St.	Ballard, J. - Edwards, L. H. and P. O. House		1830	No style
320	High St.	Rice, L. House		1860	Greek Revival
321	High St.		Blacksmith Shop	1850	Not researched
322	High St.	Todd, D. House		1830	Federal
322	High St.	Todd, D. House		1830	Greek Revival
325	High St.			1870	Italianate
325	High St.			1870	Queen Anne
326	High St.	Whitman, J. and C. P. House		1835	Greek Revival
914	High St.				
1	Main St.	Cooley Place	Goodnow, E. R. E. Farm	1900	Federal
2	Main St.	Sears, J. D. House		1850	Greek Revival
2	Main St.	Sears, J. D. House		1850	Victorian Eclectic
3	Main St.	Saint Christopher's Baptist Church		1803	Greek Revival
4	Main St.	Congregational Church Parsonage		1845	Greek Revival

5	Main St.	Charlemont Congregational Church	Charlemont Federated Church	1845	Greek Revival
6	Main St.	Marcy, A. H. Tin Shop		1840	Greek Revival
7	Main St.	Tyler, Ansel L. House		1820	Federal
8	Main St.	Edward, R. R. House		1845	Greek Revival
9	Main St.				Greek Revival

MHC Inventory #	Street Name	Historic Name	Common Name	Year	Style
10	Main St.	Village Schoolhouse		1845	Greek Revival
11	Main St.	Wells Corner Country Store	Tyler, A. J. Store	1845	Greek Revival
12	Main St.			1845	Greek Revival
13	Main St.	Tyler's Store and Post Office		1840	Greek Revival
14	Main St.	Goodnow Hall	Charlemont Town Hall	1892	Richardsonian Romanesque
16	Main St.	Niles, W. E. and Rogers, C. Shoe Shop		1840	No style
16	Main St.	Niles, W. E. and Rogers, C. Shoe Shop		1840	Victorian Eclectic
17	Main St.			1879	Greek Revival
17	Main St.			1879	Colonial Revival
18	Main St.			1860	Greek Revival
19	Main St.	Avery, A. L. and Sons General Store		1855	Greek Revival
20	Main St.			1825	No style
21	Main St.	Pond, F. A. Block	Post Office Block	1850	Italianate
21	Main St.	Pond, F. A. Block	Post Office Block	1850	Federal
22	Main St.	Boot Mart		1850	Greek Revival
23	Main St.			1840	Greek Revival
23	Main St.			1840	Italianate
24	Main St.	Bemis Block		1890	Victorian Eclectic
24	Main St.	Bemis Block		1890	Italianate
25	Main St.	Charlemont Elementary School		1907	Greek Revival
26	Main St.	Charlemont Odd Fellows Hall		1901	Victorian Eclectic
29	Main St.	Charlemont Stage House - Charlemont Inn		1787	Federal

30	Main St.	Rice, Charles H. Boarding House	Village Cafe	1790	No style
30	Main St.	Rice, Charles H. Boarding House	Village Cafe	1790	Greek Revival
31	Main St.	Harris, A. House		1840	No style
31	Main St.	Harris, A. House		1840	Greek Revival
33	Main St.				No style
33	Main St.				Victorian Eclectic
34	Main St.			1870	Victorian Eclectic
35	Main St.				No style
35	Main St.				Victorian Eclectic
36	Main St.	Rice, Moses - Warner, Charles Didley House	Buttonball House	1742	Colonial

MHC Inventory #	Street Name	Historic Name	Common Name	Year	Style
36	Main St.	Rice, Moses - Warner, Charles Didley House	Buttonball House	1742	Federal
37	Main St.				No style
38	Main St.				Greek Revival
38	Main St.				No style
39	Main St.			1830	Federal
40	Main St.				No style
41	Main St.				No style
41	Main St.				Colonial Revival
42	Main St.				No style
42	Main St.				Federal
43	Main St.			1800	Federal
43	Main St.			1800	Greek Revival
44	Main St.			1830	Greek Revival
45	Main St.	Charlemont Unitarian Church	Charlemont Methodist Church	1840	Greek Revival
46	Main St.	Bakers Grain Depot		1930	No style
49	Main St.	Warner, N. G. House		1790	Federal
51	Main St.			1890	No style
51	Main St.			1890	Victorian Eclectic
52	Main St.			1880	Stick Style
52	Main St.			1880	Queen Anne
53	Main St.			1880	Queen Anne

54	Main St.			1858	No style
56	Main St.	Peck, Charles House		1845	No style
56	Main St.	Peck, Charles House		1845	Colonial
305	Main St.			1890	Stick Style
305	Main St.			1890	Queen Anne
306	Main St.			1890	Stick Style
306	Main St.			1890	Queen Anne
307	Main St.			1890	Stick Style
307	Main St.			1890	Queen Anne
308	Main St.			1880	Queen Anne
308	Main St.			1880	Shingle Style
309	Main St.			1870	Greek Revival
310	Main St.			1860	Greek Revival
311	Main St.			1890	Queen Anne
312	Main St.	Hunt, W. House		1850	Greek Revival
313	Main St.	Sears, P. House		1860	Greek Revival
317	Main St.	Mansfield, B. P. House		1840	Greek Revival
318	Main St.	Kwik Mart		1975	Not researched
319	Main St.			1880	Greek Revival
323	Main St.	Bates, S. House		1840	Greek Revival

MHC Inventory #	Street Name	Historic Name	Common Name	Year	Style
324	Main St.	Mayhew, H. H. House		1820	Greek Revival
333	Main St.			1880	Victorian Eclectic
333	Main St.			1880	Not researched
803	Main St.	Village Cemetery		1797	
903	Main St.	Charlemont Settlement Marker			
905	Main St.	War Memorial Monument			
906	Main St.	Rice, Moses Monument and Grave Site		1871	
915	Maxwell Rd.	Maxwell Road Bridge over Maxwell Brook	Bridge #12	1939	
101	Rte.2/Mohawk Trail				No style
102	Rte.2/Mohawk Trail				No style
103	Rte.2/Mohawk Trail			1800	Federal

104	Rte.2/Mohawk Trail			1800	Federal
105	Rte.2/Mohawk Trail			1800	No style
106	Rte.2/Mohawk Trail				No style
108	Rte.2/Mohawk Trail				No style
109	Rte.2/Mohawk Trail				No style
109	Rte.2/Mohawk Trail				Greek Revival
110	Rte.2/Mohawk Trail		Leavitt House		Federal
111	Rte.2/Mohawk Trail				No style
112	Rte.2/Mohawk Trail	Wilcox Motel			Greek Revival
201	Rte.2/Mohawk Trail				Greek Revival
201	Rte.2/Mohawk Trail				No style
202	Rte.2/Mohawk Trail		Leavitt Homestead	1800	Federal
203	Rte.2/Mohawk Trail			1830	Federal
204	Rte.2/Mohawk Trail	East Charlemont Bible Church and School			Greek Revival
204	Rte.2/Mohawk Trail	East Charlemont Bible Church and School			Not researched

MHC Inventory #	Street Name	Historic Name	Common Name	Year	Style
205	Rte.2/Mohawk Trail			1830	Federal
206	Rte.2/Mohawk Trail			1830	Greek Revival
206	Rte.2/Mohawk Trail			1830	Federal
207	Rte.2/Mohawk Trail	East Charlemont District School	Little Red School House		No style
208	Rte.2/Mohawk Trail	Adams, Gen. Hap House		1780	Colonial
209	Rte.2/Mohawk Trail				No style

210	Rte.2/Mohawk Trail				No style
210	Rte.2/Mohawk Trail				Federal
211	Rte.2/Mohawk Trail				Italianate
211	Rte.2/Mohawk Trail				No style
212	Rte.2/Mohawk Trail			1830	Federal
213	Rte.2/Mohawk Trail			1870	Victorian Eclectic
213	Rte.2/Mohawk Trail			1870	Italianate
214	Rte.2/Mohawk Trail			1830	Federal
801	Rte.2/Mohawk Trail	Leavitt Cemetery			
902	Rte.2/Mohawk Trail	Hall Tavern Marker			
904	Rte.2/Mohawk Trail	Taylor Fort Marker			
107	Mountain Branch Rd.	Charlemont Center Schoolhouse			No style
47	North Heath Rd.	Bishop, E. L. - Porter, Levi M. House		1743	Colonial
47	North Heath Rd.	Bishop, E. L. - Porter, Levi M. House		1743	Greek Revival
907	North Heath Rd.	Bissell Covered Bridge	North Heath Road Covered Bridge	1951	
912	North River Rd.	Four Mile Square Bridge	North River Road Bridge	1937	
32	Rice Rd.	Rice, Samuel House		1752	No style
32	Rice Rd.	Rice, Samuel House		1752	Greek Revival
48	North Street	Snath Wooden Handle Factory	Charlemont Redman's Hall	1840	No style

MHC Inventory #	**Street Name**	**Historic Name**	**Common Name**	**Year**	**Style**
331	North Street	Rice, H. A. House		1820	Federal
332	Rice Rd.			1880	Not researched
327	Riddell St.			1870	Victorian Eclectic
328	Riddell St.			1880	Not researched
329	Riddell St.			1870	Not researched

330	Riddell St.			1870	Victorian Eclectic
909	River Rd.	Florida Bridge	River Road Bridge	1886	
911	Rte.2/Mohawk Trail	Route 2 Bridge		1931	
913	Rte.2/Mohawk Trail	Route 2 Bridge		1954	
304	Rowe Rd.			1870	Victorian Eclectic
304	Rowe Rd.			1870	Stick Style
342	Rte.2/Mohawk Trail	Development #4 Power Facility - Cable Way House		1913	No style
343	Rte.2/Mohawk Trail	Development #4 Power Facility - Headgate House		1913	No style
344	Rte.2/Mohawk Trail	Development #4 Power Facility - Watchman's Shed	Development #4 Power Facility - Warming Hut	1914	No style
910	Rte.2/Mohawk Trail	Mohawk Trail		1700	
916	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Campground Stone Steps	Mohawk Trail State Forest - Spring Enclosure	1933	
334	Rte.2/Mohawk Trail	Mohawk Trail State Forest - CCC Administration Bld	Mohawk Trail State Forest - Nature Center	1936	Not researched
335	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Rental Cabin #1		1934	Not researched
336	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Rental Cabin #2		1934	Not researched
337	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Rental Cabin #3		1934	Not researched
338	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Rental Cabin #4		1934	Not researched
339	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Rental Cabin #5		1990	Not researched
340	Rte.2/Mohawk Trail	Mohawk Trail State Forest - Comfort Station		1990	Not researched
341	Rte. 8A North	Memorial Park Exhibition Hall	Charlemont Fairgrounds Exhibition Hall	1872	No style
908	Rte 8A North	Charlemont Fairground - Memorial Park Grandstand		1871	
MHC Inventory #	**Street Name**	**Historic Name**	**Common Name**	**Year**	**Style**

800	South Heath Rd.	Colonial Burial Ground, Old		1760	
301	Zoar Rd.			1800	Federal
302	Zoar Rd.				No style
303	Zoar Rd.			1850	Greek Revival
303	Zoar Rd.			1850	No style
802	Zoar Rd.				
900	Zoar-Rowe Rd.	Zoar - Rowe Road Bridge over Pelham Brook		1939	
A		Charlemont Center District			
B		Charlemont Center Village			
C		East Charlemont			
D		Charlemont Village Historic District			
E		Mohawk Trail State Forest - Campground			
F		Mohawk Trail			
G		Deerfield River Hydroelectric Development #4			

Source: Mass. Historical Commission, 2002.

APPENDIX B: Americans with Disabilities Act (ADA) Access Self-Evaluation

One of the requirements of a state-approved Open Space and Recreation Plan is an ADA Access Self-Evaluation. The ADA Self-Evaluation describes how accessible a community's conservation and recreation programs and facilities are to people with disabilities. Its purpose is to highlight what still needs to be accomplished so that more people can enjoy the parks and recreation programs offered by the town.

The following pages include all the necessary components of the Evaluation. Three areas need to be evaluated based on the ADA Access requirements: Administrative Requirements, Program Accessibility (includes the Facility Inventory and Transition Plan), and Employment Practices.

Part One of the Evaluation includes the following Administrative Requirements:

- Designation of an ADA Coordinator
- Grievance Procedures- The Town of Charlemont Section 504 Grievance Procedure.

- The Public Notification Requirements.
- Participation of Individuals with Disabilities or Organizations Representing the Disabled Community- See the Transition Plan.

Part Two of the Evaluation focuses on Program Accessibility and includes:

- A Transition Plan for two properties in Charlemont (Hawlemont School sports field and the Charlemont Fairgrounds).

Part Three of the Evaluation is Employment Practices and includes:

- A copy of a letter from the town's ADA Coordinator attesting that Charlemont is in compliance with the Americans with Disabilities Act.
- A description of fair compensation policy.
- The Town of Charlemont Sharing Handicapped Regulations.
- Charlemont's Affirmative Action Policy Non-Discrimination Against the Handicapped.