

TOWN OF COLRAIN

OPEN SPACE AND RECREATION PLAN 2004

Prepared by the
COLRAIN OPEN SPACE
PLANNING COMMITTEE



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PLANNING COMMITTEE
With the Assistance of

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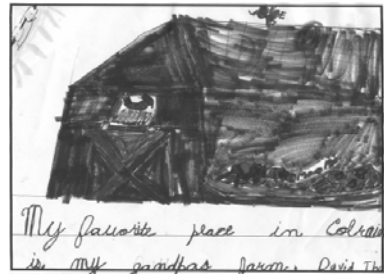
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SECTION 1



PLAN SUMMARY

The 2004 Colrain Open Space and Recreation Plan is a comprehensive inventory of the town's natural, agricultural, cultural and recreational resources and a plan for their stewardship and conservation. It contains an analysis of the town's needs plus goals and objectives designed to guide important decisions about the use, conservation and development of the town's land and resources. A five-year action plan provides real steps that the town can take towards achieving these goals.

The Plan emphasizes the remarkable wealth of the town's resources, including:

- Prime farmland and seventeen working agricultural businesses;
- Large blocks of contiguous forest;
- Cook and Catamount State Forests
- BioMap Core Habitats for rare species;
- High yield aquifers under the North River;
- A great new site for a ball field; and,
- A number of scenic and historic landscapes.

These resources provide residents with clean air and water, jobs, and access to an abundance of recreational opportunities. Colrain'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.

Colrain is fortunate in comparison to many towns in Massachusetts, in that two thirds of the farmland in town has been protected from development through the Agricultural Preservation Restriction Program. In addition, almost one third of all the 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. Conservation of priority lands will require increased public awareness of their value and a concerted, cooperative effort on behalf of landowners, elected officials, municipal boards and committees and resident volunteers.



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 the Colrain Conservation Commission to determine residents' interest in working towards the completion of their own plan. Colrain agreed to participate and began to organize a group of people to serve on an Open Space Planning Committee. The grant to assist Colrain, Leyden, and Charlemont in the development of their own OSRP was awarded to the Franklin Regional Council of Governments (FRCOG) Planning Department.

A. STATEMENT OF PURPOSE

The purpose of this plan 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 Colrain. This OSRP represents two and a half years of consensus building on 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 an Open Space Committee and other town boards and commissions, will successfully implement the town's open space and recreation goals and objectives.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

An Open Space and Recreation Survey was developed and reviewed by the Colrain Open Space Planning Committee (OSPC). The survey was mailed to 842 households in town. The rate of return was 22 percent. The survey results were compiled into a report (*see Appendix*) and presented for review at the November 26, 2002 meeting of the OSPC. A draft of Section 8 – Goals and Objectives was also reviewed at the November meeting.

Including the Public Forum, which was held on March 13, 2004 and involved over twenty people, there have been fourteen public meetings of the Colrain Open Space Planning Committee. Before each meeting, members were sent drafts of sections to read. This form of work review was a significant and consistent vehicle for public participation in the development of the Open Space and Recreation Plan. Overall, fifty different residents participated in at least one meeting and members often represented different town boards and committees including:

- Select Board,
- Planning Board,
- Conservation Commission,
- Shelburne Falls Fire District,
- Zoning Board of Appeals,
- Historical Society, and,
- Historical Commission.

Any comments expressed at the public forum were recorded on flip chart paper 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 Colrain Open Space and Recreation Plan.



SECTION 3



COMMUNITY SETTING

The Town of Colrain contains rural landscapes that have been established, developed, and affected by its human inhabitants over the past several hundred years. Planning for open space in Colrain 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, such as drinking water supplies, will reduce the quality of life for future generations.

The information provided in this section, Community Setting, inventories and assesses the human and land use components of the landscape, moving from the present, to the past, and then to the potential future based on current development trends. The Regional Context gives a snapshot of Colrain today, and identifies the ways in which the location of the town within the region has affected its growth and quality of open space and recreational resources. History of the Community looks at the manner in which the human inhabitants settled and developed the landscapes in Colrain. Next, using statistical information and analysis, Population Characteristics shows the reader who the people of Colrain are today and how population and economic trends may affect the town in the future. Finally, Growth and Development Patterns describes specifically how the Town of Colrain has developed over time and the potential future impacts that the current zoning may have on open space, drinking water supplies, and municipal services.

A. REGIONAL CONTEXT

Regional Context concentrates on the location of the Town of Colrain relative to natural and socio-economic resources as well as conditions shared by communities in the region. It describes the significant influence a town's physical location can have on its characteristics, including the quality and quantity of open space in the town as well as its recreational resources. Regional Context also considers the impact that different land uses, located within Colrain and surrounding communities, have on regional open space and recreational resources.

The Town of Colrain is located in northwestern Massachusetts, in central Franklin County. Colrain is bordered by Halifax and Guilford, Vermont on the north; Leyden on the east; Shelburne and Greenfield on the south; Charlemont on the southwestern corner; and Heath on the west.

A.1 Natural Resources Context

In order to plan for the protection of open space and natural resources in the Town of Colrain, residents should consider the role natural resources play across the region. Two regional landscape-level natural resources important in both Colrain and in surrounding communities are abundant and contiguous forestland and watersheds (Deerfield River, North River and Green River Watersheds). The presence and relatedness of these significant resources present 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 Colrain and the region. The Commonwealth of Massachusetts owns approximately 2,745 acres of the forestland in Colrain, which is overseen by the Department of Environmental Management. These forestlands include Catamount State Forest (1,125 acres), located in southwestern Colrain and eastern Charlemont and H.O. Cook State Forest (1,620 acres), located in northwestern Colrain and northeastern Heath. The Mass. Division of Fisheries and Wildlife (DFW) owns and manages the Catamount Wildlife Management Area (WMA) located in southwestern Colrain. Catamount WMA contains a total of 256 acres in two parcels, which abut Catamount State Forest.

The Massachusetts Natural Heritage and Endangered Species Program's (NHESP) BioMap uses Estimated Habitats and other documentation to identify the areas most in need of protection in order to protect the native biodiversity of the Commonwealth. The BioMap focuses primarily on state-listed rare species and exemplary natural communities and was developed to promote strategic land protection of areas, which would provide suitable habitat over the long term for the maximum number of Massachusetts terrestrial and wetland plant and animal species and natural communities. The BioMap shows areas designated as Core Habitats and Supporting Natural Landscapes. The Core Habitat areas include the most viable habitat for rare plants and rare animals and exemplary natural communities. The Supporting Natural Landscapes includes buffer areas around the Core Habitats, large undeveloped patches of vegetation, large "road-less" areas, and undeveloped watersheds. The Core Habitat areas were identified, through field surveys, as supporting viable populations of rare plant and animal species while the Supporting Natural Landscape areas were determined through analyses using Geographic Information Systems (GIS) mapping programs.

Of the many large areas of contiguous forest in Colrain, four are considered by the NHESP to contain Supporting Natural Landscapes that buffer or link lands to Core Habitat areas:

- The southwestern forest block contains Catamount State Forest and forests west of Shattuckville and Griswoldville. It contains the largest Core Habitat area in



- town and is part of a larger forest block that stretches into eastern Charlemont to the Deerfield River.
- The southern block lies to the east of Call Road on the western slopes of Colrain Mountain. These forests are contiguous to a very large Core Habitat area in Shelburne along High Ledges and Massaemett Mountain.
- The western central block of forest that contains Supporting Natural Landscapes is located between Wilson and Adamsville Roads and Rte. 112 along the eastern slopes of Christian Hill.
- The eastern block of forest stretches from beyond the Vermont border, south along the Green River to northwestern Greenfield and east into Bernardston. Three separate Core Habitat areas exist within this block including:
 - Forestland north of Stewartsville, east of New County Road, into northwestern Leyden;
 - Forestland along the Green River; and,
 - Forestland east of East Colrain Road in the vicinity of Workman Brook and south into Greenfield.

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, areas of unfragmented forest are more suitable for active forest management.

A.1.2. Watersheds

Watersheds are the areas of land that drain to a single point along a stream or river. The Town of Colrain is located in the northeastern 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, Massachusetts, the Deerfield River drains a regional landscape that is 665 square miles in size, of which 347 are in Massachusetts (DRWA; 2002). The Deerfield's 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 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.

Subwatersheds contain first and second order stream tributaries. These 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 things that result from protecting forestland are maintaining the long-term integrity of wildlife habitats and water quality within the watershed's surface and ground waters.

The Green River Subwatershed is located in southern Vermont and northwestern Massachusetts. It has a drainage area of 89.9 square miles and is comprised of numerous small streams, many of which originate in the uplands of eastern Colrain. The River itself originates in southern Vermont and flows into Massachusetts in the Town of Colrain forming the town's eastern border with the Town of Leyden. The Green River flows southeasterly through a steep narrow valley and, as it enters the Town of Greenfield, its gradient lessens. The segment of the river from the Vermont-Massachusetts border to the Greenfield Wastewater Treatment Plant is considered as a Class B, cold water fishery, with high quality water designations (Mass. DEP website, 2002).

The North River Subwatershed is located in northwestern Massachusetts and southern Vermont, draining 94.2 square miles. The East Branch and the West Branch of the North River are the two main tributaries of the North River. The East Branch originates at Ryder Pond in Whitingham, Vermont and converges with the West Branch north of Griswoldville, in south-central Colrain. The West Branch also originates in the Town of Whitingham. Smaller streams, which are also part of the North River Watershed, include Foundry Brook, Taylor Brook, Tisdell Brook, Vincent Brook, and Roberts Brook. Forests predominate the upland slopes of the Watershed while the floodplain areas are mostly agricultural. The East and West Branch, as well as the North River from the confluence of the East and West Branches to the former Veratec Treatment Plant, have all been designated as Class B, cold water fisheries with high quality water. However, the stretch of the river from the Plant to its confluence with the Deerfield River is not given a high quality water designation (Mass. DEP website, 2002). Even so, the North River's generally excellent water quality and cold water fishery habitat ensure its consideration as a key component in the Connecticut River Atlantic Salmon restoration project.

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 Colrain 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 less significant. Colrain 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

Waterpower, manufacturing, and agriculture all have had an influence on the development and growth of the Town of Colrain. Like many communities along the major waterways in the region, Colrain has experienced economic decline since its manufacturing heyday. As will be described in the next section, Colrain's manufacturing centers developed due to the harnessing of the hydro-power of the North River. However, manufacturing declined across the region during the latter half of the 20th Century.

Agriculture has also played a role in the Town of Colrain throughout its history. During the late 1880s and early 1900s Colrain ranked third in Franklin County in the production of agricultural products. Dairy, sheep and poultry farming were important agricultural enterprises. Due to the suitable climate, apple orchards were planted and became a major agricultural crop.

Between 1970 and 2000, the Town of Colrain's population continued to grow and is projected to increase by approximately 10 percent in this decade. The loss of manufacturing jobs in Colrain, 1990-2000, and the associated reduction of other service and retail employment in the community, is consistent with a state-wide trend towards longer commuter travel times as fewer residents find work in their town of residence. At the same time, income levels among residents are running just under the average for Franklin County while the town's unemployment rate in 2001 was lower than the state and national average. It appears as if Colrain residents have overcome the loss of in-town employment by finding work elsewhere.

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 Colrain for residential development as compared to communities along the Interstate 91 corridor, though according to population projections, this trend may change. Thus, the community may have a brief opportunity to protect natural, open space, and recreation resources in advance of 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 were to wait for the need for land protection to become more apparent.

B. HISTORY OF THE COMMUNITY

Colrain was settled in the 1740s by Presbyterian Scotch Irish during the hardships of the French and Indian Wars. Settlement was initially on the southeastern uplands of the town and along the North River alluvial lands. Fort Morrison, Fort Lucas, South Fort Morris, and McDowell's Fort were constructed by the settlers to defend the inhabitants. Several deadly Indian attacks occurred. A treaty ended the wars in 1763 and settlement proceeded rapidly due to good agricultural land, timber, and water power sites. The Town of Colrain was incorporated in 1761.

Over the next sixty years of development, the town's land use patterns were established. Forests were cleared and farms were located on the good soils. Water powered mills were set up on the North and Green Rivers, and most of the brooks, for sawmills, gristmills, and for manufacturing. Around the mills, the villages of Adamsville, Elm Grove, Foundry Village, Shattuckville, Griswoldville, and others were established. The villages were the local hubs with taverns, schools, churches, stores, and the residences of trades people. The town's civic center was located at Colrain Center.

Agriculture determined the patterns of the landscape. Livestock had relatively high value and was the basis of farm wealth. In the early 19th century, Colrain was the second highest wool producing town in Franklin County, following Ashfield. Pastures were cleared on the hillsides to support sheep and cows. The forest cover was reduced to around 20 percent by the 1850s. Large quantities of cheese and butter were produced on the farms. Cultivated acres were devoted to corn, grain, and potato production. The elevations, soils, and climate made the town very favorable for apple growing. In the 20th century, better transportation to markets encouraged egg, poultry, and milk production.

Manufacturing contributed to the development of the villages. Around 1814, Isaac Johnson and Warren Wing established the first cotton spinning mill in Franklin County at Shattuckville. Joseph Griswold established a cotton textile mill at Griswoldville in 1832 and another at Willis Place in 1865. As the century progressed, the mills expanded and attracted French Canadian and English mill worker families to live in mill owned housing. By 1837, two iron furnaces had been established, one at Foundry Village and the other at Willis Place, to cast iron products including wood stoves. The wood industries were important. There were sash and blind works in Elm Grove and Griswoldville, a furniture shop in Lyonsville, wagon shops, turning shops, box shop, cooper shop, and more than a dozen saw mills around town.

Emigration to Vermont, New York State, and the west began in the late 18th century. The population reached a peak of 2,016 around 1810 and slowly declined afterwards. The growth of manufacturing jobs offset the abandonment of some of the upland farms. The Shattuckville cotton mill closed in 1920. The population reached a low point of 1,391



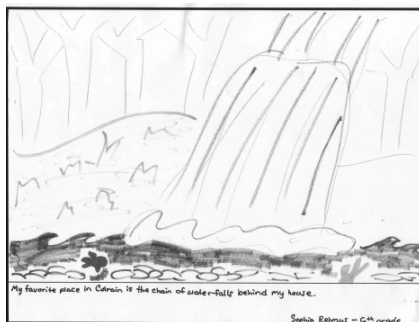
around 1930. The town's location away from railroads and interstate highways reduced economic opportunities and development.

Since the mid 20th century, land use patterns have been affected by the reduction in the number of farms and farm animals. Pastures have grown up into forests. Homes constructed outside of the villages for non-farming residents have reduced the agricultural focus of the countryside. Automobiles have increased the mobility of the residents and reduced their reliance on the local economy. The large cotton mills have closed and have recently been torn down, leaving BBA Nonwovens as the last fiber mill in town.

Colrain's significant historic resources are its agricultural and village land use patterns. The living history of productive fields, pastures and old farmsteads contributes to the town's special character. Wood lots and extensive forests continue to support the local wood industries. The villages retain interesting 19th century buildings associated with the town's personages and events. The architecture in this working landscape represents what the rest of New England once looked like.

Important historic resources that relate to open space are:

- The North River farms - the historic farm landscapes north of Colrain center to the Vermont border.
- The Catamount Hills - an old settlement area in the late 18th century, which was later abandoned. The area includes old cellar holes, stonewalls, a cemetery, bridges, and the site where the American flag was first flown over a school in 1812. Catamount State Forest has recreational history with McLeod Pond, the cave and catamount dens as attractions.
- Cook State Forest has 1930s tree plantations and was a C.C.C. camp.
- Located throughout town are abandoned roads with double stonewalls and old house sites, which are historically significant and currently used for recreational hiking and snowmobiling.



C. POPULATION CHARACTERISTICS

In this section, Population Characteristics, Colrain’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 Colrain, and measures of income. The employment statistics section covers labor force, and employment by industry sector.

C.1 Demographic Information

C.1.1 Population and Population Change

Demographics are useful for forecasting the need for open space and recreational resources that may be required by residents over time. According to the U.S. Census, Colrain’s population growth rate during the 1970s and the 1980s was greater than the county and state averages (See Table 3-2). In the 1990s, Colrain grew at a faster rate than the county but less than the state. Between 1970 and 2000, Colrain’s population increased by 393 people (Table 3-1), equal to a growth rate of 27.7 percent. This is in contrast to Franklin County as a whole, which saw a 20.8 percent increase in population from 1970-2000 and to the Commonwealth of Massachusetts, which saw an 11.6 percent increase in population. Colrain has a population density of 42 people per square mile (Commonwealth of Mass. Dept. of Housing and Community Development).

Table 3-1: Population for Colrain, Franklin County and Massachusetts 1970-2000

	Population 1970 (# of People)	Population 1980 (# of People)	Population 1990 (# of People)	Population 2000 (# of People)	Population Increase 1970-2000 (# of People)
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097	659,720
Franklin County	59,233	64,317	70,092	71,535	12,302
Colrain	1,420	1,552	1,757	1,813	393

Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the Massachusetts Institute of Social and Economic Research (M.I.S.E.R.), July, 1999.

According to the Massachusetts Institute of Social and Economic Research (MISER), the town will once again experience an increase in population during the ten year period 2000-2010. MISER projects the Town of Colrain will gain 177 residents, which would be an increase of 9.8 percent. This is over three times the growth experienced in the 1990s. Again, this would be in contrast to Franklin County and Massachusetts, which are expected to have a gain in population of 7.8 percent and 5.5 percent, respectively (See Table 3-2 and Figure 3-1).



MISER’s projections, released in 1999, relied heavily on 1990 U.S. Census data and intermediary population estimates produced during 1990-1999, prior to the 2000 census. MISER will be updating its projections over the next few years to reflect information gathered during the 2000 U.S. Census. The new MISER forecasts, which will likely extend to 2025, may possibly show different trends and patterns than those suggested by the current projections.

Table 3-2: Population Growth and Growth Rates for 1970-2000, and Projections for 2000-2010 for Colrain, Franklin County, and Massachusetts

	Colrain	Franklin County	Massachusetts
Population Growth, 1970-1980 (# of People)	132	5,084	47,660
Percent Population Growth, 1970-1980	9.3%	8.6%	0.8%
Population Growth, 1980-1990 (# of People)	205	5,775	279,388
Percent Population Growth, 1980-1990	13.2%	9.0%	4.9%
Population Growth, 1990-2000 (# of People)	56	1,443	332,672
Percent Population Growth, 1990-2000	3.2%	2.1%	5.5%
Population Growth, 1970-2000 (# of People)	393	12,302	659,720
Percent Population Growth, 1970-2000	27.7%	20.8%	11.6%
Projected Population Growth, 2000-2010 (# of People)	177	5,550	349,897
Projected Percent Population Growth, 2000-2010	9.8%	7.5%	5.5%

Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the Massachusetts Institute of Social and Economic Research (M.I.S.E.R.); July 1999.

If we assume Colrain could experience a 9.8 percent increase in population by the year 2010, how would this translate into demand for open space and recreational resources? Would these additional residents be young, middle-aged, or elderly and, what would be the age distribution of the population in 2010? How could these changes in population impact demand for open space and recreational resources?

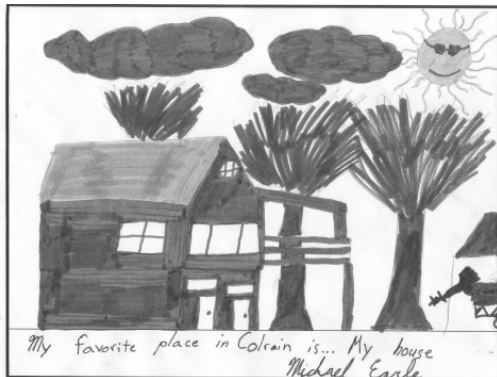
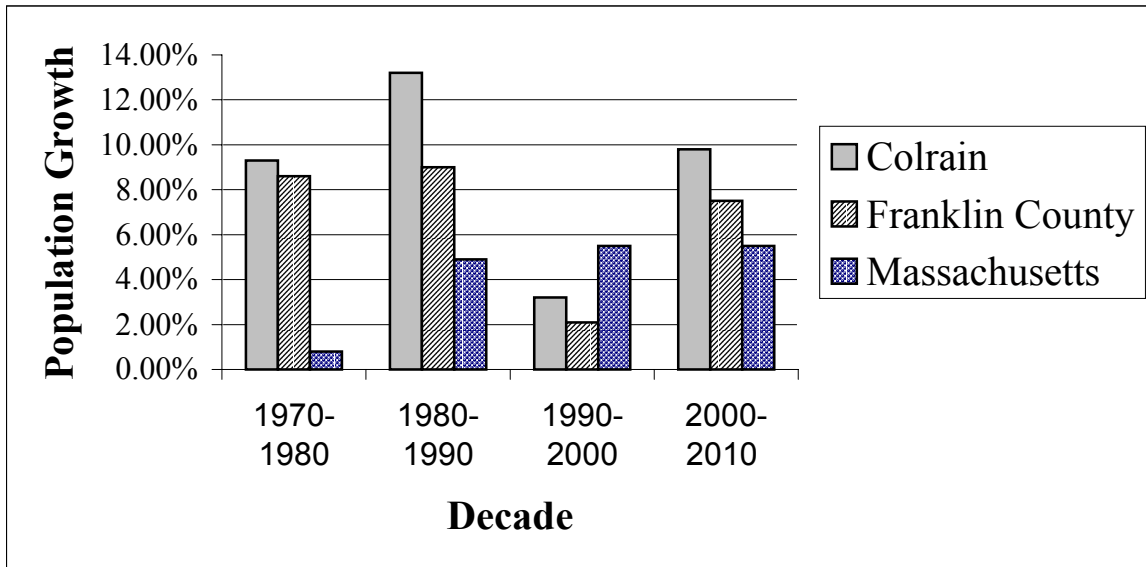


Figure 3-1: Population Growth Rates for Colrain, Franklin County, and Massachusetts 1970-1980, 1980-1990, 1990-2000 and Population Projections 2000-2010



Sources: Growth and Estimated Growth from U.S. Census of Population and Housing, Projection data from the Massachusetts Institute of Social and Economic Research (M.I.S.E.R.); July 1999.

According to the U.S. Census 2000 General Demographic Characteristics, the Town of Colrain has a relatively young population with a majority of its residents in the 0-19 and 20-44 (early working years) age cohorts (See Table 3-3). However, the 45-64 year age cohort experienced an increase in numbers with a 32.3 percent increase over the ten year period 1990-2000. Based on the Census data it would appear that residents in the 20-44 age cohort are leaving the region and to a lesser extent, the state, due possibly to better job markets elsewhere. In addition, the numbers of children (and thus younger families) have increased overall in the state, and decreased in the county and in Colrain, which seems to support the idea that young families typically go where the jobs are most prevalent. There were twenty-five more residents, who were at least 65 years of age in 2000, than there were in 1990. This is an overall increase of 12.7 percent, which is much greater than the county (0.5 percent) and the state (5.5 percent) averages.

Table 3-3: Number of People by Age Cohort Between 1990 and 2000 in Massachusetts, Franklin County, and in Colrain

Age Cohort	Massachusetts Population		% Change	Franklin County Population		% Change	Colrain Population		% Change
	1990	2000		1990	2000		1990	2000	
0-19 years	1,561,017	1,675,113	7.3%	19,038	18,502	-2.8%	567	540	-4.8%
20-44 years	2,530,390	2,394,062	-5.4%	28,635	24,303	-15.1%	671	625	-6.9%
45-64 years	1,110,013	1,419,760	27.9%	12,289	18,550	50.9%	322	426	32.3%
65+ years	815,005	860,162	5.5%	10,130	10,180	.5%	197	222	12.7%

Source: U.S. Census, 1990 and 2000.



Colrain currently has a large number of young people (0-19 years old); a shrinking younger (20-44) work force; a smaller yet growing older work force (45-64), which typically earns higher incomes than the younger worker cohort; and, a growing elderly population. If the relatively large cohort of older (45-64) working-aged residents were to continue to reside in Colrain, it could result in a significant population of individuals in the older age cohort in ten to twenty years. How will the Town of Colrain provide recreational facilities and services for all of its residents, especially the elderly, which may require accessible walking paths, arts, and leisure programs? Residents of all ages may need facilities and programs that provide safe spaces for recreating as well as access to open space.

Identifying the best location for the development of new open space and recreation resources should consider where the concentration of population will occur and which parts of the local citizenry require specific needs. As will be seen in the fourth part of Section 3, Growth and Development Patterns, future growth depends in large part on zoning, slopes, 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 that are close to the current distinct neighborhoods and/or areas that could be later developed for residential uses. Officials could be looking for opportunities to conserve land in Colrain that protects valuable scenic and natural resources and provides public access to trail networks and open spaces.

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

C.1.2 Economic Wealth of Residents and Community

Measures of the income levels of Colrain residents as compared to the County and State are helpful in assessing the ability of the citizenry to pay for recreational resources and programs and access to open space.

Table 3-4 describes the earning power of residents in Colrain as compared to the County and the State. Colrain households earn incomes that are 1.7 percent below the median for the County and 20.6 percent below the median for the State. The per capita income for the town (total income for all residents divided by the total population) is lower than both the County and the State. However, the percentage of people living below the poverty line in Colrain is significantly lower than both the County and the State at 6.8 percent. It appears that the financial well-being of Colrain residents is on par with the average for households in the county, but lower than the average for the state. Colrain's lower per

capita income figure may be due to the town's having more people per household (2.64) than the county average (2.37).

Table 3-4: Median Household Income, Per Capita Income, and Percentage Below Poverty Level in 1999 for Colrain compared to Franklin County and the State

	Median Household Income	Per Capita Income	Percentage Below Poverty Level*
Colrain	\$40,076	\$18,948	6.8%
Franklin County	\$40,768	\$20,672	9.4%
Massachusetts	\$50,502	\$25,952	9.3%

Source: 2000 Census of Population.

*Individuals living below poverty level for whom the poverty status has been determined.

Although Colrain's resources today are clearly both its people and its natural landscapes, the status of its finances could be affected by an interdependent relationship that exists between the two. The costs of the community services provided to residents are paid for with the tax revenues generated by different kinds of property, both developed and undeveloped. Some developed uses like housing are often considered a loss because the school costs of one household are rarely made up by the revenues generated by that same property. One reason that towns encourage economic development is to have some other type of property to share the tax burden. Protected open space on the other hand costs very little, provides a meager amount of tax revenues, but reduces the amount of housing that can occur. This relationship is explored in more detail in subsection D. Growth and Development Patterns.

C.2 Employment Statistics

Employment statistics like labor force, unemployment rates, numbers of employees, and place of employment are used to describe the local economy. Labor force figures can reflect the ability of a community to provide workers to fuel incoming and expanding businesses. Unemployment rates can show how well residents are fairing in the larger economy while employment figures describe the number of employees in different types of businesses. Employment can be used as a measure of productivity that can be used to gauge, which should be encouraged in town. The town may decide to encourage business development to supply local jobs and to build taxable value, which can help pay for municipal services and facilities, including recreational parks and programming as well as protected open space.

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

In the year 2001, the Town of Colrain had a labor force of 922 with 893 residents employed and 29 unemployed (Mass. Division of Employment and Training) (See Table 3-5). Colrain experienced a 3.1 percent rate of unemployment, whereas Franklin County



had a rate of 3.2 percent and the Commonwealth of Massachusetts had a rate of 3.7 percent. Outside of 1997 and 1998, it would appear that Colrain residents had similar rates of unemployment over the past eight years as did residents across the county and the state.

Table 3-5: Labor Force and Unemployment Rate in Colrain 1994-2001

	1994	1995	1996	1997	1998	1999	2000	2001	1994-2001 Change	% Change
Number of People in the Labor Force and Employed	835	851	850	874	891	908	899	893	58	6.9%
Number of People in the Labor Force and Unemployed	45	45	38	56	47	29	25	29	16	-35.6%
Unemployment Rate in Colrain	5.1%	5.0%	4.3%	6.0%	5.0%	3.1%	2.7%	3.1%	-2.0%	N/A
Unemployment Rate in Franklin County	5.2%	4.7%	3.8%	3.8%	3.3%	2.9%	2.6%	3.2%	-2.0%	
Unemployment Rate in Massachusetts	6.0%	5.4%	4.3%	4.0%	3.2%	3.2%	2.6%	3.7%	-2.3%	

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

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

Table 3-6 depicts sector employment in the county and state as a percentage of total employment. The Table demonstrates that the manufacturing, trade and service sectors on both the state and the county levels produced the highest percentage of total employment in 1998, together combining for over 80 percent in the State and 85 percent in the 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. Though it has declined some since the beginning of the decade, the sector still employed a quarter of the people in the county (25.75 percent) in 1998. Whereas, the state, which has lost many manufacturing jobs since 1990, employed only 14 percent of its total workers in that sector. Using the same comparative analysis, other competitive sectors in the county are Agriculture, and Transportation, Communication (Information), and Public Utilities (T.C.P.U). Since these sectors are employing more people in the county than the state average, they may be producing more goods and services than their counterparts in other areas of the State. Therefore, it can be said that these sectors are most likely exporting their goods and bringing money into the region.

Another important technique for determining the relative strengths and weaknesses of the county employment sectors as compared to the state is to analyze the changes in employment over time. This method also shows that manufacturing is relatively strong in Franklin County. For example, during the period from 1990 to 1998, the county's manufacturing sector lost 4 percent of its jobs, while the sector in the state as a whole lost 28 percent. Though also declining on both levels, Agriculture and Trade declined slower in the county than in the State as a whole during those same eight years. Weaker sectors in the county, construction and F.I.R.E (Finance, Insurance and Real Estate) declined at a greater rate in Franklin County than in the state. Analysis of the seven sectors most commonly analyzed found only the T.C.P.U (Transportation, Communication and Public Utilities) and services sectors demonstrating growth between 1990 and 1998 in both Franklin County and in the state. Services grew at a slightly greater pace in the state while T.C.P.U. grew slightly faster on the county level.

Table 3-6: Employment by Industry Sector for Franklin County and State of Massachusetts as a Percentage of Total Employment, 1990 and 1998

Industry Sectors	1990 Franklin County	1998 Franklin County	1990 Massachusetts	1998 Massachusetts
Agriculture	0.67%	0.45%	0.43%	0.04%
Construction	4.25%	3.23%	3.91%	3.63%
Manufacturing	26.87%	25.75%	19.40%	14.02%
T.C.P.U.	4.84%	6.86%	4.75%	6.62%
Trade	25.81%	25.20%	26.06%	24.64%
F.I.R.E.	6.05%	3.60%	8.93%	8.85%
Services	31.52%	34.85%	36.51%	41.42%

Source: County Business Patterns 1990 and 1998, Bureau of the Census.

T.C.P.U.: Transportation, Communication, and Public Utilities; Trade: Wholesale and Retail Trade;

F.I.R.E.: Finance, Insurance, and Real Estate.

It is important to note that there are differences in the data sources for employment statistics. The county and state figures come from the Bureau of the Census' County Business Patterns, which does not include the government sector and which has as its most recent data, 1998 figures. The employment figures for Colrain come from the Massachusetts Division of Employment and Training, which includes the government sector and, which provides more recent data from 2001. In Table 3-7, employment statistics are presented for the years 1990 and 1998 so as to compare Colrain's statistics with the county and state figures (which use the same time period). The table also includes data for 2001 to show the most current information for Colrain.

Although Colrain's economy is linked to that of the county and state, it is different in several aspects (See Table 3-7). Based on employment, a comparison of the leading sectors can be made between town, county and the state using the 1990 and 1998 data provided by the Division of Employment and Training. However, the Open Space Planning Committee provided more accurate 2001 data reflecting a more significant share of total employment being provided by the agricultural and construction sectors. For example, in 2001 at least fifty people were employed in the agricultural sector



representing nearly 17 percent of total employment. Construction provided sixteen jobs or 5.4 percent of total employment. Using the 2001 figures, the three sectors providing the most jobs in Colrain were manufacturing, agriculture, and government, which is quite different than the dominant sectors in the county (services, manufacturing, and trade) and the state (services, trade, manufacturing).

Table 3-7: Employment by Industry Sector for Colrain as a Percentage of Total Private Sector Employment, 1990 and 2001

Industry Sectors	1990 Colrain Employed	1990 Percentage of Total	1998 Colrain Employed	1998 Percentage of Total	2001 Colrain Employed	2001 Percentage of Total
Agriculture	conf*		19	6.7%	50**	16.9%
Construction	7	1.9%	2	.7%	16**	5.4%
Manufacturing	241	64.3%	152	53.5%	143	48.3%
T.C.P.U.	conf		conf		0	
Trade	33	8.8%	15	5.3%	0	
F.I.R.E.	conf		conf		0	
Services	43	11.5%	32	11.3%	22	7.4%
Government	conf		58	20.4%	65	22.0%
Totals	375		284		259	

Source: Commonwealth of Massachusetts, Division of Employment and Training, 2002. *conf: DET suppresses this data due to confidentiality. **2001 employment figures provided by Open Space Committee members.

A comparison of the 1998 employment figures for Agriculture in Colrain (6.7 percent), Franklin County (0.45 percent), and in Massachusetts (0.04 percent) demonstrates another important finding. Agriculture (farmers, foresters, and loggers) is a greater employer, and therefore more competitive business in Colrain than the county and state average. According to Table 3-8, which shows employment figures for different industry sectors in Colrain, the agriculture sector employed 23 persons in 1992, which exceeded the number of people employed in the services and trade sectors in different years. Despite its decline in the past year, agriculture is still an important industry in town. Agriculture provides many public benefits beyond employment. Fresh food, retention of significant historical landscapes, scenery, and rural character are just a few of the contributions that active agricultural businesses provide to Colrain residents.

Table 3-8: Employment by Industry Sector for Colrain, 1990-2001

Year	Total	Agriculture Forestry Fishing	Government	Construction	Manufacturing	TCPU	Trade	FIRE	Services
1990	375	conf	conf	7	241	conf	33	conf	43
1991	391	conf	conf	8	258	conf	23	conf	37
1992	393	23	conf	8	272	conf	24	conf	38
1993	350	conf	conf	4	251	conf	conf	conf	46
1994	331	conf	conf	4	245	conf	conf	conf	27
1995	360	conf	conf	conf	249	conf	6	conf	31
1996	366	conf	conf	conf	243	conf	12	conf	31
1997	307	15	55	conf	conf	conf	18	conf	32
1998	284	19	58	2	152	conf	15	conf	32
1999	309	19	60	3	189	4	9	conf	23
2000	293	21	63	4	168	4	12	conf	20
2001	259	12	65	5	143	0	0	0	22

Source: Commonwealth of Massachusetts, Division of Employment and Training. TCPU = Transportation, Communication and Public Utilities, FIRE = Finance, Insurance and Real Estate
 Trade = Wholesale and Retail Trade, conf = data suppressed due to confidentiality. *In 1997, state government changed its reporting method to more accurately reflect the location of its employees. Caution is advised in comparing 1997 government employment data on the community level with prior years.

Between 1990 and 2001 there were other trends important to note:

- Manufacturing employment (and total employment) in Colrain began to decline after its peak in 1992 with 272 employees to its low of 143 in 2001; and,
- The Services sector has been on the decline since its peak of 46 employees in 1993;

These local trends are similar to county and state employment trends except for the Services sector. The Services industry sector includes hotels, personal, business, automotive, entertainment, recreation, health, legal, educational, social, managerial, and engineering services. The Services sector is growing in both numbers of employees and in its share of total employment in the County, the State, and in the Nation overall, which means that it could be a more significant part of the local economy. Town officials could strengthen the local economy by supporting existing manufacturing industries, facilitating local ownership and entrepreneurship in the services sectors, and by encouraging local agricultural businesses.

The reduction in manufacturing employment in town is likely one of the causes of another trend: increasing numbers of residents commuting outside of Franklin County to work. According to the 1990 and 2000 U.S. Census figures, the percentage of Colrain residents who worked in town decreased from 30 percent to 21 percent as did those that commuted to jobs in other towns in the county, from 62 percent to 59 percent (see Table 3-9). The greatest increase during the decade occurred with commuters traveling to jobs in other counties (from 5 percent to 16 percent). Open Space Planning Committee members suggest that this reflects the number of workers that now work at the University



of Massachusetts at Amherst and at Verizon in Springfield. There was also an increase in the number of residents that commuted out of state (from 2.8 percent to 3.8 percent). These trends were common to other communities in the county and across the Commonwealth.

Table 3-9: Place of Employment for Workers 16 Years and Over in 1990 and in 2000

	Worked in Town of Residence	Worked out of Town of Residence but in County of Residence	Worked out of County of Residence but in State of Residence	Worked out of State of Residence
Colrain in 2000	21.3%	58.7 %	16.2%	3.8%
Colrain in 1990	30.3%	62.2%	4.7%	2.8%
Franklin County in 2000	27.6%	34.9%	33.4 %	4.1%
Franklin County in 1990	35.8%	35.8%	24.9%	3.4%
Massachusetts In 2000	31.3%	35.4%	30.1%	3.3%
Massachusetts In 1990	36.5%	35.9%	24.5%	3.1%

Source: U.S. Census Bureau, Census 1990 and 2000.

Colrain’s population is expected to grow by nearly 180 people over the next decade. The overall population will continue to age if older working residents continue to reside in town. A growing senior population will have implications for land use within the river valleys and villages. Residents may continue to depend on jobs in other communities and counties, yet manufacturing will likely retain its local importance as an employer. Agriculture can continue to offer Colrain residents with limited employment opportunities and all of the other benefits including scenery and access to fresh, locally grown food. Two trends that have implications for farming: increasing commuter times of Massachusetts workers and increasing population. No longer can Colrain expect its natural rural landscape to be forever outside the influence of development. On the contrary, Massachusetts is a slowly urbanizing state and Colrain, though located far west of the Route 495 beltway may experience the renewed interest of prospective homeowners looking for a quieter pace of living.

D. GROWTH AND DEVELOPMENT PATTERNS

D.1 Patterns and Trends

Over the past two hundred years, Colrain residents developed their community using the productivity of the area’s forests and good grazing soils, and on the waterpower of the North River. In the 20th century, Colrain saw the closing of some of its manufacturing businesses while agriculture remained a significant part of the local economy. One result

of the overall decline in manufacturing from its peak during the Federal Period was a loss of population from 2,016 in 1810 to 1,420 in 1970.

In 1970, the predominant land use in Colrain was forest, though crop and pasture land could be found in a contiguous band along the floodplains of the West and East Branch and straddling most roads in town. Open land existed as abandoned farmland and power line easements. The most common development pattern in 1970 was single-family homes on open, road-side lots at least ½ acre in size, and on ¼ acre to ½ acre areas near villages, mostly located in the southern half of town.

Between 1971 and 1997, the predominant land use changes in the Town of Colrain were the construction of single-family homes on lots at least ½ acre in size all over town but especially in the Christian Hill area; and, the conversion of pasture and cropland to forest and residential use. Most (if not all) of the residential development has been in the form of approval-not-required lots.

D.2 Infrastructure

D.2.1 Transportation Systems

Running along the North River is the Town of Colrain's principle highway, State Route 112. This is a north-south thoroughfare linking Colrain with Shelburne Falls to the south and Jacksonville, Vermont to the north. It is an important route for tourists, most especially skiers on their way to the slopes in Vermont. Greenfield Road is considered an important link to State Route 2, a major east-west highway in Northern Massachusetts, which intersects with Interstate Route 91, a major north-south route.

There is no regular public transportation in Colrain. Transportation for the elderly and people with disabilities is provided by the Franklin Regional Transportation Authority (FRTA).

D.2.2 Water Supply Systems

The Town of Colrain is served by three community public water systems. These service a small number of the town's residents. The remainder of the town's population is serviced by private wells.

The **Colrain Fire District** serves approximately 100 people with forty-two service connections. The existing well, the main source of water, is located off Jacksonville Road (Route 112). Water is pumped to a storage tank with a 50,000 gallon capacity. Water production for 2001 was 0.665 million gallons with an average daily use of 1,800 gallons per day. The safe yield of the well, which is its capacity to pump water consistently without diminishing returns for an extended period of time, is 46,800 gallons per day.



Overall, 98 percent of the water went to residences, 1 percent to a summer camp and 1 percent to a transient residential area. This water supply will likely be sufficient for at least the next twenty years assuming the number of people it serves increases no faster than the town's projected population growth rate.

The District also maintains a surface water source consisting of an upper and lower reservoir off Greenfield Road. These reservoirs are currently for emergency supply only. The upper reservoir has a capacity of 11.5 million gallons. The lower reservoir is an intake reservoir only and has a storage capacity of 0.5 million gallons.

The Colrain Fire District has a 347-foot Zone I surrounding its wellhead off Jacksonville Road. The District does not own or control the land east of the pumping station across the North River. However, according to the Mass. Department of Environmental Protection, there does not appear to be any inappropriate land uses that might threaten the ground water quality.

The **Griswoldville Water District** is located on Route 112 in the south-central portion of town. It has a ground water source with forty-four service connections serving a population of approximately 125. In the year 2001, water production was 4.997 million gallons with an average daily use of 14,000 gallons. Ninety-eight percent of this water went to residential use and 2 percent went to commercial uses. Its safe yield is 108,000 gallons per day.

Currently, the Griswoldville Water District does not own the Zone I protective radius (333 ft.) around its wellhead. The only land use within the Zone I not related to the District is Call Road. The Interim Wellhead Protection Area (IWPA) is described as a radius of 800 feet from the well. The only land use not related to the District is a residence on Call Road.

The **Shelburne Falls Fire District** has two active wells, and an emergency supply in the Fox Brook Reservoir. The wells are located between 120 and 165 feet from the banks of the North River. Farmland on the west side of the North River and within the Interim Wellhead Protection Area is protected through the Agricultural Preservation Restriction Program. Fox Brook Reservoir has a surface area of approximately 3 acres and a total storage capacity of 12 million gallons. In 2001, the Fire District served approximately 2,200 residents of Buckland, Shelburne and to a lesser degree Colrain, and commercial businesses and industries with 66.5 million gallons of drinking water with an average annual daily withdrawal of 182,104 gallons. The registered withdrawal for the system is 310,000 gallons per day, while the approved volume for the one active well is 347,040. Roughly half of the water consumed in 2001 was by Buckland residents and businesses and half by Shelburne's. The Shelburne Falls Fire District serves fifty residents in Colrain. The Shelburne Falls Fire District has a delineated Zone II Recharge Area.

D.3 Long-term Development Patterns

Long-term development patterns will be based on a combination of land use controls and population trends.

D.3.1 Land Use Controls

The Town of Colrain has three local land use controls: zoning districts, an overlay district, and a recent amendment to the bylaws: Section VI-5 Back Lot Development with Open Space Set-Aside.

Residential development of frontage lots on existing roads will likely be the dominant short-term development pattern given current zoning. Colrain's zoning includes three use districts: Village, Commercial-Industrial, and Rural District. The Village districts in Colrain Center, Griswoldville, and Shattuckville primarily allow single-family and two-family homes, agricultural and recreational uses, community services and business uses only with special permits. The Commercial-Industrial Districts, of which there are four, Griswoldville, Lyonsville, Prolovich, and Stewartville, allow business and professional offices with less than six employees, as well as community uses, agricultural and recreational, and residential uses by right and other commercial and industrial uses by special permit. The rest of town is located within the Rural District, which allows single-family dwellings, some community services, agricultural and recreational uses by right, and other uses by special permit.

The density of development allowed depends on the district in which the land is located. The Village Districts require lots to be 20,000 sq. ft. in size, have at least 100 feet of frontage on a way, and leave at least 30 percent of the lot in vegetation. The Rural Districts require a building lot to be 1 and ½ acres or 65,340 sq. ft. in size, have at least 300 feet of frontage on a road, and leave at least 75 percent of the lot in undeveloped use. The Commercial-Industrial District requires lots to be at least 2 acres in size or 87,120 sq. ft. in area, have 300 feet of frontage, and have at least 50 percent of the area in undeveloped use.

The overlay district is the Flood Plain District. The regulations of the Flood Plain District are designed to only restrict development within the floodway, which would result in increased flood levels for that particular river during a 100-year flood.

The Back-lot Development with Open Space Set-Aside bylaw is designed to allow for the development of up to four back lots, 1 and ½ acres in size, which do not have the required minimum frontage to access a public way via a common driveway across land of other's ownership. In exchange, the landowner or developer would have to permanently protect from development (and restrict its future use to agriculture) at a minimum, an equal amount of land (1.5 acres in size) with at least 300 feet of frontage, for every back lot developed.



D.3.2 Build-out Analysis

To illustrate some of the long-term effects of current zoning, results of a build-out study are included here. This build-out study was completed in 2001 as part of a statewide effort funded by the Executive Office of Environmental Affairs. The methodology and results of the build-out study and associated GIS mapping are explained below. It is important to note that the recent Zoning revisions changed the location, number, and size of the Commercial-Industrial (CI) and the Village Districts. Although, these changes would have some impact on the numbers of residential lots or commercial and industrial floor area in the build-out analysis presented here, the overall change is not significant given that the predominant amount of developable land is in the Rural District. Of the entire 16,173 acres determined to be developable (of Colrain's total 27,848 acres in land area), less than 160 acres were located in the Village and CI Districts. In comparison, there were over 16,000 acres considered developable within the Rural District.

The purpose of a build-out analysis is to determine potentially developable land areas for residential, commercial, and industrial development. The process starts with identifying existing development based on 1997 MacConnell Land Use data and new subdivisions built since that time. 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 identified by the National Wetlands Inventory, 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 land owned by a state natural resource agency and farmland in the Agricultural Preservation Restriction Program. Some areas that many residents would expect to be protected, such as land owned by municipal water districts to protect public water supplies, are not considered to be off-limits to development unless a conservation restriction or some other legal mechanism is in place to permanently protect the land as open space. Slopes between fifteen and twenty-five 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 slopes of fifteen and twenty-five percent would prevent commercial and industrial development and residential development on small lots. However, it was assumed that large lot residential development could occur on slopes between fifteen and twenty-five percent given greater flexibility to grade and site structures. The areas that remain after the screening process are considered potentially developable.

Zoning districts are then overlain on the potentially developable areas and a "build factor" is calculated based on 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 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 (See Table 3-10). Commercial and industrial square footage is similarly calculated and its associated demand for water is estimated.

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. Planning is needed to identify key resources to protect and the areas most suitable for development. Once completed, Open Space and Master Plans should be implemented by adopting zoning revisions and land protection programs to realize the balance desired by a community between natural resource protection and development.

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

Potentially Developable Land (acres)	16,174
Total Residential Lots	9,767
Total Residential Units	10,055
Comm./Ind. Buildable Floor Area (sq. ft.)	1,315,573
Residential Water Use (gallons per day) [2]	2,126,633
Comm./Ind. Water Use (gallons per day) [2]	98,668
Non-Recycled Solid Waste (tons/year) [3]	10,344
Total Population at Build-out	30,168
New Residents [4]	28,355
New Students [5]	5,906
New Residential Subdivision Roads (miles)	134

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
 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 Town of Colrain has zoning that is designed to promote village, commercial, industrial, and rural residential uses. However, the predominant development pattern is that of residential development in outlying rural areas of Colrain. The largest district, the Rural District, is open to large lot residential use with few constraints. According to the worst case scenario, this could result in over ten thousand (10,055) new housing units sprawled over the landscape.

Although it is not possible to determine exactly when build-out might occur, this may not even be necessary. Before the last acre was developed, Colrain residents could experience drinking water shortages. In addition, with over 5,900 new school children at build-out, town officials would have to build many new elementary schools. New subdivisions could result in the need for over 134 new miles of roads that would have to be built and maintained. Fire and police services would have to expand to protect the

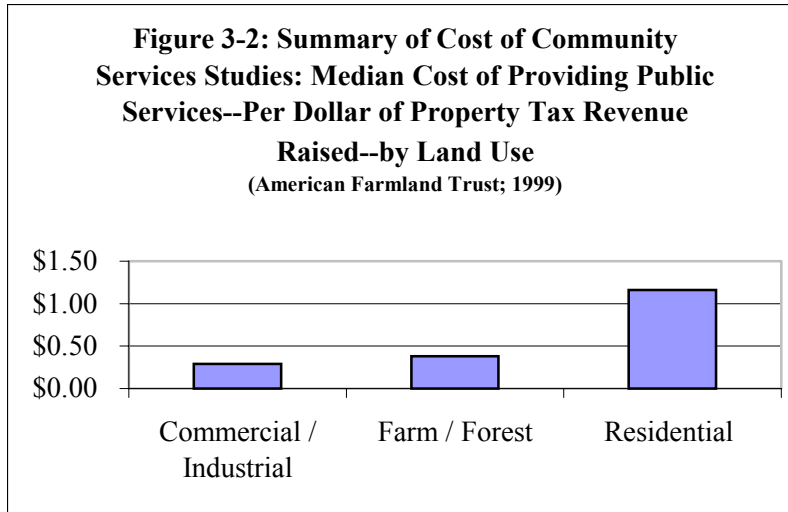


increased population. It is likely that at some point on the path towards complete build-out, the Town of Colrain would seek to control this expensive pattern of development.

There would be both ecological and economic impacts caused by this degree of population growth and development. Ecological impacts could include a reduction in available clean drinking water, decreases in the quantity and quality of wildlife and fisheries habitats, a reduction in the quality of first and second order streams, lower air quality, lower biodiversity, increases to erosion, and the fragmentation of the large areas of forest by subdivisions.

The economic impacts of this level of population growth and development would be felt well before maximum build-out was reached. Would the additional commercial and industrial property help to pay for the costs of supporting the increasing demand for municipal services like education? The challenge for Colrain will be to find a model for growth that protects vital natural resource systems like aquifers and their recharge areas and prime farmland soils and at the same time promotes a stable property tax rate. In designing the model it is important to understand the measurable fiscal impacts of different land uses. For instance, permanently protected open space (e.g. farmland/forest), residential, and commercial /industrial development each have a different fiscal impact depending on the relationship of property tax revenues generated to municipal services consumed. There is a process by which the fiscal value of these three different land uses are compared within a town to determine whether a use has a positive or negative fiscal impact. This process is called a Cost of Community Services (COCS) analysis.

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 residential uses cost more in services that they provide in tax revenues and that protection of open space is an effective strategy for promoting a stable tax base. The studies found that for every dollar generated by residential uses they cost on average \$1.16 in services, while commercial and industrial uses used 29 cents and open space, an average of only 38 cents. Protected open space results 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. The findings were confirmed by another 47 COCS analyses conducted across the country in the 1990s. Figure 3-2 demonstrates the summary of the 58 COCS studies. For every dollar of property tax revenues received from residential property, the amount of money expended by the town to support homeowners is over a dollar, while farm/forestland and commercial/industrial property provide a positive fiscal impact.



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 having a 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 to encourage might have some of the following characteristics: locally owned and operated; in the Services sector; use of a large amount of taxable personal property; being 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.

In conclusion, Colrain may consider:

- Protecting open space near village centers to provide access to the elderly and all ages;
- Encouraging manufacturing despite its declining employment numbers in the town and in the state;
- Considering ways to direct future development where impacts to natural, open space, and recreational resources will be minimized; and,
- Supporting local businesses in the agricultural sector for their economic contribution to residents, because of the public benefits received from active farming, and to offset the costs of potential future residential development.



By continuing to pursue strategies that involve active land protection, zoning measures that direct development while protecting natural resources, and sustainable economic development, Colrain can continue to grow and stabilize its property tax rates while maintaining its rural character.

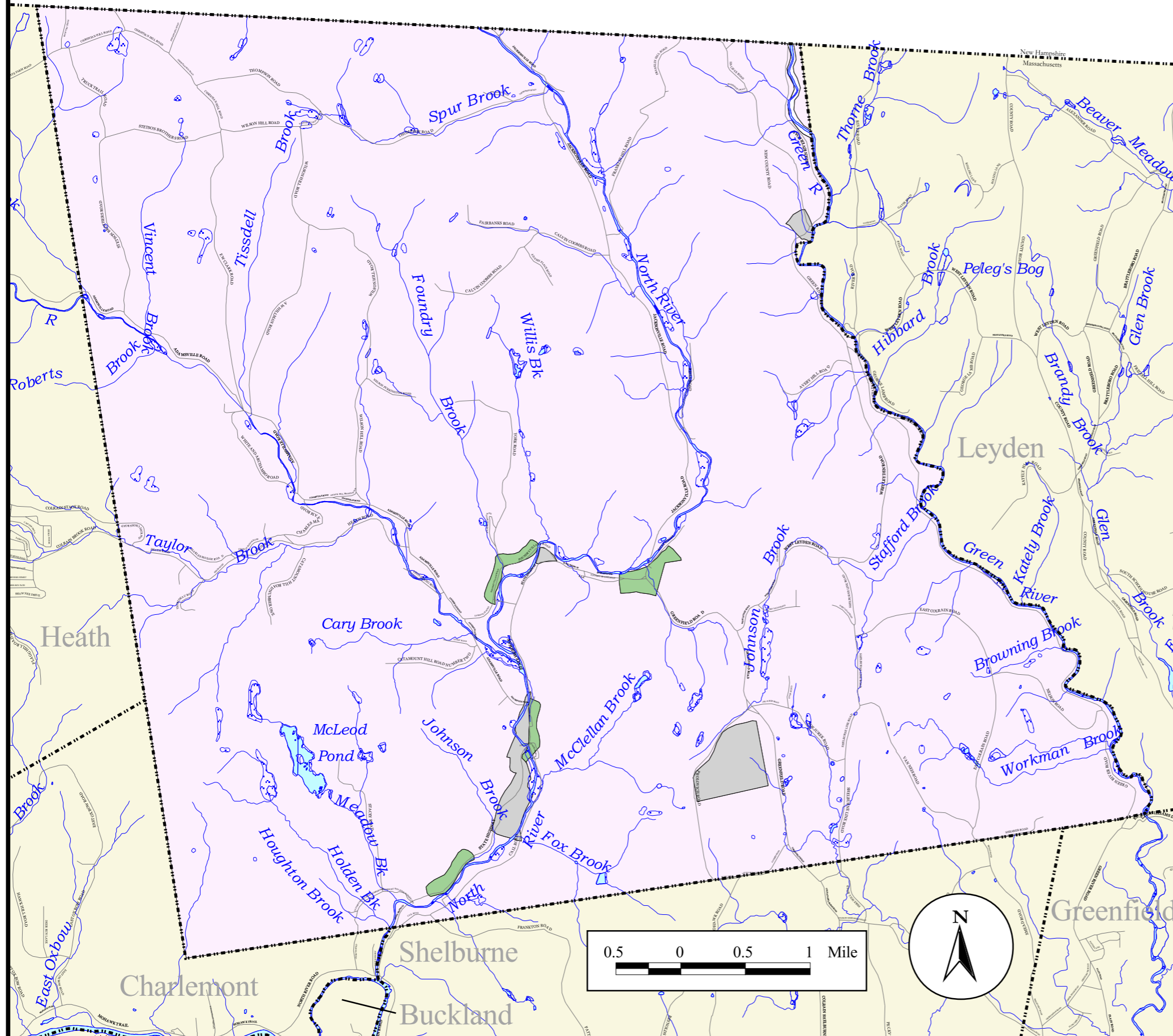













Town of Colrain

Open Space and Recreation Plan

Zoning



Legend

- | | | | |
|---|-------------------------------------|---|--------------------------------|
|  | Town line |  | Commercial/Industrial District |
|  | Rail line |  | Rural District |
|  | Road |  | Village District |
|  | Stream or river | | |
|  | Water | | |
|  | National Wetlands Inventory wetland | | |

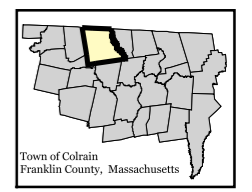
Map Sources:

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, pond, National Wetlands Inventory 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.

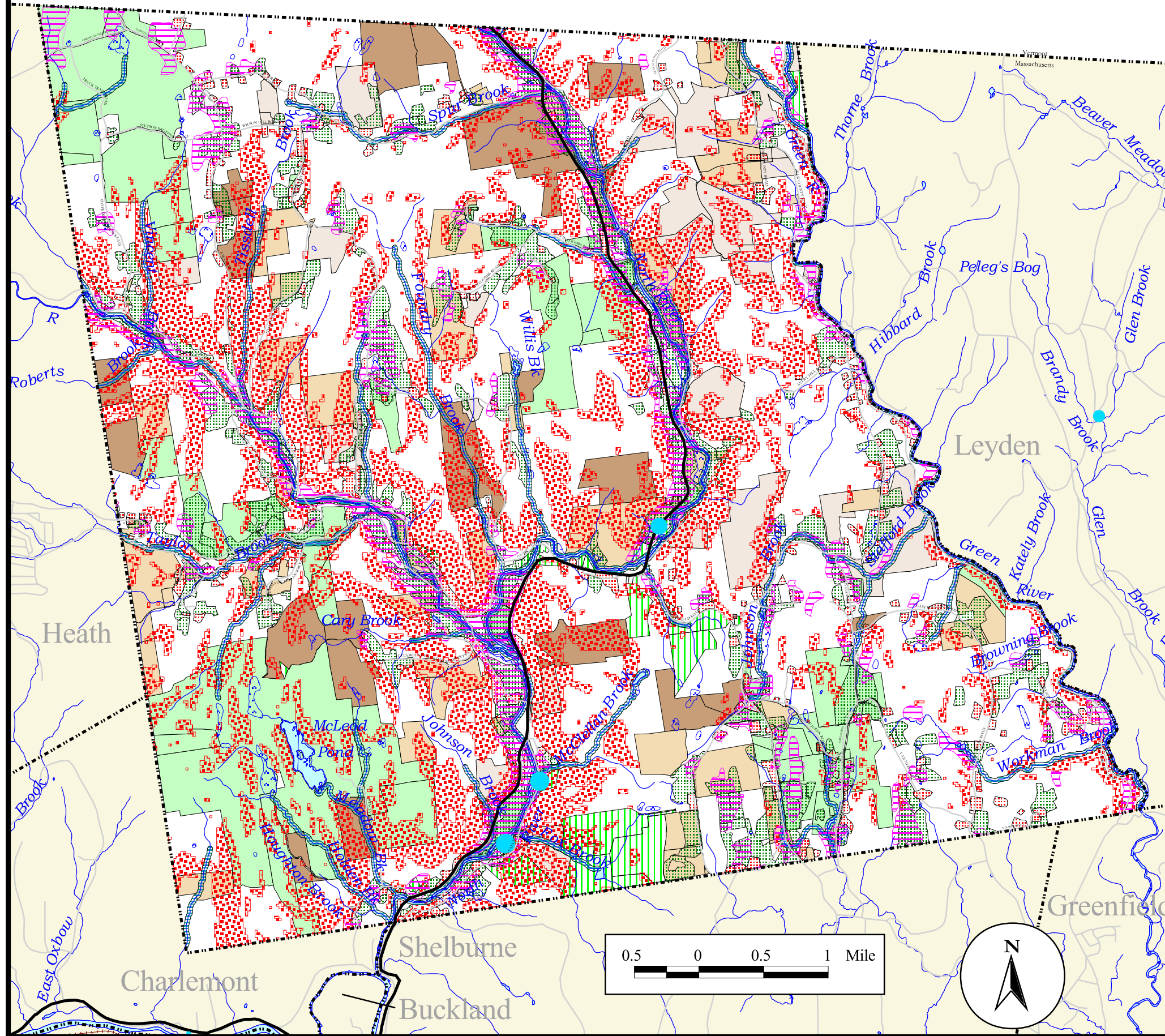
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 Greenfield, Massachusetts 01301



Town of Colrain

Open Space and Recreation Plan

Developable Soils and Development Constraints



Legend

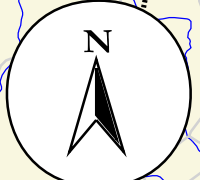
	Town Line		Open Space with Permanent Protection
	Rail Lines		Open Space with Limited Protection
	Roads		Chapter 61: Forestry (Temporary Protection)
	Major roads		Chapter 61A: Agriculture (Temporary Protection)
	Streams and Rivers		Chapter 61B: Recreation (Temporary Protection)
	Slope greater than 25%		Crop, pasture, orchard
	Prime Farmland Soils		Residential
	Zone I		National Wetlands Inventory wetland
	Water body		River Protection Act 0-100 feet from river bank
	National Wetlands Inventory wetland		

Map Sources:

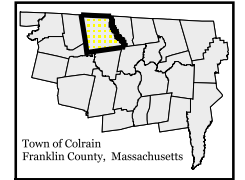
Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs 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, River Protection Act, slope, soil, zone I, and land use data provided by MassGIS. Farmland soils digitized by FRCOG planning department staff from 1979 U.S. Soil Conservation Service Map "Important Farmlands of Franklin County."

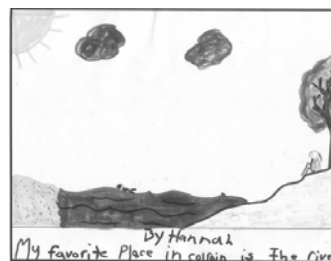
Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.



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SECTION 4



ENVIRONMENTAL INVENTORY AND ANALYSIS

The scenic landscape of the Town of Colrain 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) interact 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. Colrain residents need to understand the impact of their actions and land uses on the environment and their quality of life.

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. Colrain'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. Colrain'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 relating to open space and recreation planning must take into consideration the inherent suitability of a site for different uses. 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 Town of Colrain is composed primarily of steep-walled narrow valleys and rolling hills. Gentler terrain can be found along the fertile flood plains of the East and West Branches of the North River, where much of Colrain's prime farmland soils can be found. Other prime farmland soils can be found in East Colrain. Although steep slopes can be found throughout the town, the highest elevations occur west of the East Branch. The highest elevations in this western section range between 1,451 ft. and 1,794 ft. above sea level, while elevations east of the East Branch are significantly lower with some less than 1,000 ft. above sea level.

A.2 Geology

The Town of Colrain 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 Colrain'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 brought alluvium, including gravels, sand and silt. At the time, the area that is now the Town of Colrain 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 Colrain, 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.

During the end of the last ice age, a great inland lake formed in the Connecticut River Valley. Fed by streams melting from the receding glacier, Lake Hitchcock covered an area approximately 150 miles long and twelve miles wide, stretching from St. Johnsbury, Vermont to Rocky Hill, Connecticut. Streams deposited sand and gravel in deltas as they entered the lake, while smaller silts and clays were carried into deeper waters.

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 Colrain 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 Colrain. The following sub-section provides a description of the soils in Colrain based on their impact on agriculture, recreation opportunities, and wildlife habitat.

Which soils constrain development given current technologies?

The Lyman, Westminster, and Colrain soils are the predominant soils found on the moderate to steep slopes, while the Buckland soils are those that can be found in the nearly level to moderately steep hills in town.

The Westminster and Lyman soils 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. The Buckland soils consist of moderately well drained, fine sandy loams. These soils formed in compact glacial deposits. At a level of twenty inches, the Buckland soils have a hard layer that is



difficult to dig. Although water passes through these soils rapidly, the Buckland soils are considered wet and seepy because water moves slowly through the dense substratum.

Which soils are particularly suited for recreational opportunities and 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 wildlife and to outdoor recreation enthusiasts such as hikers, mountain bikers and snowshoers.

The soils of Colrain that support certain recreation activities are of the Westminster - Colrain - Buckland association and the Lyman soils. The Westminster - Colrain - Buckland soils are found in forested, stony and rocky, gently sloping to steep hills and the narrow valleys along the town's fast flowing streams. The Westminster soils are shallow and have many rock ledges and outcrops, the Colrain soils are deep and well drained and are more gently sloping, and the Buckland soils are moderately well drained and have a hard layer in the subsoil. The Lyman soils are also found in the forested, gently sloping to very steep, stony rocky uplands and are characterized as slightly droughty, shallow loams.

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, 2001, National Soil Survey Handbook). 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 economy throughout its history and continue to be in use throughout the town today. The more common soils that constitute Colrain's prime and unique agricultural land include the Merrimac - Ondawa association and the Colrain, Buckland soils. The Merrimac - Ondawa soils are found on floodplains and terraces in narrow steep sided valleys along major fast flowing streams. The soils are well drained to somewhat excessively drained, and are sandy and gravelly. The Colrain soils are deep and well drained and are found in gently sloping areas whereas the Buckland soils are moderately well drained fine sandy loams found in nearly level to

moderately steep slopes. All of these soils are considered suitable for dairy farming and the Colrain - Buckland soils support apple orchards as well.

These prime farmland soils can be found within the floodplains of the North River and its East and West Branches; in the southeast corner of Colrain in an area bounded by Prolovich, Greenfield and West Leyden Roads, the Green River and the boundary with the Town of Shelburne; in the northwest corner of Colrain along Christian Hill Road and at the intersection of Christian Hill, Stetson and Wilson Hill Roads; an area between Foundry Brook and Wilson Hill Road; and a few small scattered area along the Green River.

Interestingly, some of the best soils for orchards and grazing in Colrain have moderate slopes. Moderate slopes provide good drainage, which is important for cultivating fruit tree orchards as well as for grazing grasses.



B. LANDSCAPE CHARACTER

The character of Colrain is rugged with steep slopes, fast flowing streams, hardwood forests and abundant wildlife. Beyond this ruggedness, the gentler floodplains of the East Branch, West Branch, and the North River have historically afforded residents the opportunity for farming as well as to take advantage of the swift waters for industrial use. The town's small villages are also located along these rivers. The Green River in eastern Colrain forms the town's boundary with the Town of Leyden. For much of its length, the Green River can boast a steep and relatively undeveloped river corridor.

C. WATER RESOURCES

C.1 Watersheds

Colrain is rich in water resources, including brooks, streams, ponds, vernal pools, wetlands, and aquifers (*See the Water Resources Map*). As described in Section 3, land in the town is part of the Deerfield River Watershed, which is part of the Connecticut River Watershed. The North and Green Rivers are also important sub-watersheds within the Connecticut River Watershed. This section focuses on waters within the Town of Colrain, but it is important to keep in mind improvements in water quality in the North



River and Green River and other brooks and streams in town have impacts beyond town borders.

C.1.1 Connecticut River Watershed

The Town of Colrain lies in the Connecticut River Watershed. The Connecticut River has a “Class B” water quality designation from the New Hampshire-Vermont border to Holyoke and is classified as a warm water fishery. Class B waters are supposed to provide suitable habitat for fish and other wildlife, and to support primary contact recreational activities such as fishing and swimming. The water should also be suitable for irrigation and other agricultural uses. The classification of rivers and streams in Massachusetts does not necessarily mean that the river meets that classification, rather, classifications represent the State's goal for each river.

According to the “Connecticut River Basin 1998 Water Quality Assessment Report” published by the Massachusetts Department of Environmental Protection, the Connecticut River is impaired by polychlorinated biphenyls (PCBs) along its total length and by fecal coliform from its confluence with the Deerfield River to the Montague town line. A report published in January 1998 by the New England Interstate Water Pollution Control Commission (NEIWPCC) listed bioaccumulation and toxicity as water quality issues for the entire length of the Connecticut River in Massachusetts. Bioaccumulation refers to the concentration of toxins in organisms at higher levels in the food chain. The report specifically identified PCBs in fish. Also in 1998, the Massachusetts Department of Public Health issued a public health advisory for certain species of fish contaminated by PCBs in the Connecticut River (Commonwealth of Massachusetts Summary of Water Quality; Department of Environmental Protection; 1998). The general public is warned not to eat any affected fish species, which include channel and white catfish, American eel and yellow perch. Pregnant women and nursing mothers are advised not to eat any fish from the Connecticut River.

Although wastewater treatment facilities constructed throughout the watershed have been treating major pollution discharges for more than twenty years, the Connecticut River is still plagued by pollution from PCBs, chlorine heavy metals, erosion, landfill leachate, storm water runoff and acid rain. These pollutants come from both point sources, like wastewater treatment plants and manufacturing plants, and non-point sources, including failed residential septic systems, improperly managed manure pits and stormwater runoff carrying herbicides.

Atlantic salmon were believed to be abundant in the Connecticut River prior to European settlement. Salmon are anadromous fish, meaning that they spawn in fresh water. Construction of dams along the river blocked the passage of the salmon, and the species disappeared from the Connecticut shortly thereafter. The interagency Atlantic Salmon Restoration Program began its effort to restore salmon to the River in 1967. Schoolchildren in surrounding communities participate in this effort by raising juvenile salmon from eggs, and releasing them in local streams to begin their journey. Success of the restoration effort has been mixed. Between 1998 and 2000, a total of only 531

salmon traveled back to the river from the ocean (Pioneer Valley Planning Commission, *The Connecticut River Strategic Plan, Volume One*, July 2001).

C.1.2 Deerfield River Watershed (sub-watershed of the Connecticut River)

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, DFW, 2001). The River also supports native and stocked trout, making the Deerfield River one of the premier rivers for fishing in the region.

Recreational opportunities in the Deerfield River abound. Hiking, biking, whitewater sports, 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.

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.



Table 4-1: Summary Table of Testing Results for the Deerfield River – Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Vt. State line to confluence with the Cold River - Length -13.3 miles	Threatened <i>Due to habitat alteration relating to high temperatures and undetermined enrichment.</i>	Non-Support - upper 0.7 miles <i>Due to mercury at Sherman Reservoir.</i> Not Assessed – lower 12.6 miles	Full Support	Full Support	Class B
Confluence with the Cold River to the confluence with the North River. Length – 11.4 miles	Partial Support <i>Due to unknown toxicity. Metals and chlorine may also be lesser causes. This segment is on the 1998 303d Segments Needing Confirmation List.</i>	Not Assessed	Not Assessed	Not Assessed	Class B
Confluence with the North River to the confluence with the Green River. Length – 16.2 miles	Full Support	Full Support	Full Support	Full Support	Class B
Confluence with the Green River to the confluence with the Connecticut River. Length – 2.0 miles	Full Support	Full Support	Full Support	Full Support	Class B

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

C.1.3 North River Watershed (sub-watershed of the Deerfield River)

The North River Watershed is located in northwestern Massachusetts and southern Vermont, draining 94.2 square miles (DRWA, 2002). It is formed by the confluence of the East Branch and the West Branch. Below this confluence, the North River is impounded by a dam. The North River flows south and west, paralleling Route 112. Forests predominate the upland slopes of the watershed while the floodplain areas in the valley are mostly agricultural. Residential and industrial development in the watershed is primarily concentrated within the river floodplain. The floodplain narrows as the North flows toward its confluence with the Deerfield River, just south of North River Road at



the Buckland, Charlemont and Shelburne town lines. The North River has been given Class B, Cold Water Fishery, High Quality Water designation from the confluence of the East and West Branches to the Veratec Treatment Plant site and Class B, Cold Water Fishery for the remainder of the river to its confluence with the Deerfield River (Mass. DEP, 2000). The main stem of the North River to its confluence with the Deerfield River has been placed on the Massachusetts DEP Section 303 (d) List of Waters for 1998 for problems related to pathogens, taste, odor and color.

Given its water quality and environmental factors providing for good cold water fishery habitat, the North River is a key component in the Connecticut River Atlantic Salmon restoration project. It is also stocked with trout on an annual basis.

Historically, the North River was the site of Colrain's many mills due to the harnessing of the fast flowing River for hydropower. Manufacturing along rivers often posed an environmental threat to the rivers' health. The North River was no exception. Manufacturing in Colrain began to decline in the late 20th century. In the 1980s, the Upper Mill, located on both the east and west sides of the East Branch was closed. In 1990, fire ravaged the mill and it was subsequently abandoned. After acquiring the property by eminent domain, the Town of Colrain sought to clean up the site. In July 1998, the Environmental Protection Agency selected the Town of Colrain for its Brownfields Assessment Demonstration Pilot. The Pilot targeted the Upper Mill site as well as the former American Fiber and Finishing bleaching mill site for assessment and clean-up, and redevelopment activities. In addition to clean-up and redevelopment of the contaminated mill sites, the Pilot was also to assess the potential risks posed to the North River given the proximity of the Upper Mill site to the River. Investigations of the Upper Mill site were completed in 1999 and 2000 by Environmental Compliance Services and SEA Consultants. It was determined that should additional collapse of the Upper Mill buildings occur, building debris and asbestos contaminated runoff may drain into the North River. Given this concern the site has subsequently been cleaned and remediation completed, thus preserving the quality of the North River. One reason for maintaining water quality beyond preserving habitat is that the company BBA, relies on high water quality for its industrial processes.

Table 4-2: Summary Table of Testing Results for the North River – Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Confluence of the East and West Branches to the confluence with the Deerfield River. Length – 3.5 miles	Threatened <i>Due to pathogens and color. Nutrients and uncertain habitat alterations also impair this segment.</i>	Not Assessed	Partial Support <i>Due to fecal coliform count.</i>	Full Support To the Veratec site – 0.8 miles. Partial Support Remainder of segment- 2.7 miles. <i>Due to color.</i>	Class B

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

Surface Water Resources in the North River Watershed

McClellan Brook

McClellan Brook is located in south-central section of Colrain with its headwaters located southeast of Mount Hope. The brook flows southwesterly to its confluence with the North River south of the village of Griswoldville.

Fox Brook

Fox Brook is located in south-central Colrain. Fox Brook originates in both Colrain and the Town of Shelburne. The Fox Brook Reservoir is a three acre emergency water supply reservoir, part of the supply that serves customers in Buckland, Shelburne, and Colrain.

Johnson Brook

Johnson Brook originates in the hills northeast of Houghton Hill. It flows southeasterly to its confluence with the North River northeast of the village of Shattuckville.

Meadow Brook

Meadow Brook has its headwaters in the Catamount Hills with the main stem of the Brook flowing out of McLeod Pond in Catamount State Forest. Meadow Brook parallels Stacy Road for much of its length and eventually flows into the North River south of Shattuckville.



Holden Brook

Holden Brook originates atop Pine Hill in Catamount State Forest. It converges with Houghton Brook near their confluence with the North River.

Houghton Brook

Houghton Brook also has its headwaters in the Catamount Hills within the Catamount State Forest. Houghton Brook parallels Meadow Brook to its west and flows into the North River at the Shelburne town line.

East Branch of the North River

The East Branch originates at Ryder Pond in Whitingham, Vermont and flows southerly to its confluence with the main stem of the North River.

Spur Brook

Spur Brook originates in the hills of north-central Colrain near the Vermont border. It parallels Thompson Road for much of its length until it reaches its confluence with the East Branch.

Foundry Brook

Foundry Brook originates near Christian Hill in the northern section of Colrain and joins the East Branch of the North River at Foundry Village.

West Branch of the North River

The headwaters of the West Branch are in Whitingham, Vermont and the river flows southwesterly through the Town of Heath to the confluence with the East Branch at Griswoldville. The North River Flood Plain Management Study states the West Branch flows southeasterly to join the East Branch while the USGS topographical map shows both branches converging at the same place to create the main stem North River.

Vincent Brook

Vincent Brook is located in Colrain's rugged northwest corner near its border with the Town of Heath. The brook originates in the uplands just east of H.O. Cook State Forest and for a portion of its length travels within the boundaries of the State Forest.

Roberts Brook

Roberts Brook is a small stream in the northwest section of Colrain, which originates in the Town of Heath.

Tissdell Brook

Tissdell Brook is located in the northwest section of Colrain. It originates in the steep uplands of the area just south of Wilson Hill Road.

Taylor Brook

Taylor Brook originates in the Town of Heath and flows easterly to its confluence with the West Branch southeast of Adamsville. Numerous small tributaries that enter the brook from both the north and south feed Taylor Brook.

Cary Brook

Cary Brook originates in the Catamount Hills in the southwest section of Colrain. It enters the West Branch just north of its confluence with the main stem.

McLeod Pond

The forty acre McLeod Pond is located in a remote, undeveloped area in the Catamount Hills within Catamount State Forest. McLeod Pond is a warm water pond with an average depth of approximately four feet. The pond's water is brown and the bottom is muddy with numerous rock outcroppings. Aquatic vegetation covers 60 percent of the pond's surface area (DFW website, 2003). Due to these noxious aquatic plants, McLeod Pond has been placed on the Massachusetts DEP Section 303 (d) List of Waters for 1998.

Access to McLeod Pond is difficult and is accomplished via a rugged dirt road off Stacey Road. An informal boat launching facility is available and suitable for car top boats and canoes.

Fishing is generally poor in McLeod Pond. Only five species were found in an assessment of fish population conducted in 1979. Chain pickerel are the only game fish found in the pond. Other fish include pumpkinseed, yellow perch, brown bullhead and golden shiners.

C.1.4 Green River Watershed

The Green River Watershed is located in southern Vermont and northwestern Massachusetts. It has a drainage area of 89.9 square miles, which includes portions of Colrain, Leyden, Bernardston, Shelburne and Greenfield as well as five communities in Vermont. The total length of the Green River is 28.3 miles, 16.3 miles of which are in Massachusetts. The River itself originates in southeastern Vermont on the south side of the Mt. Olga-Hogback Ridge in the Town of Marlboro, Vt. The Green River enters Massachusetts in the Town of Colrain and forms the town's eastern border with the Town of Leyden. It flows south and east through a steep, narrow valley for much of its length and, as it enters the Town of Greenfield, its gradient lessens and the floodplain widens. The Green River boasts an undeveloped river corridor, in part due to its steep terrain and geologic features. Most roads in the watershed remain unpaved, with minimal riverside development. Most of the watershed is forested, although along the Massachusetts section, agricultural and open land can be found as well. Only as the river reaches the Town of Greenfield does it begin to experience some urban development. Given this pristine character, it is the only river in the Deerfield River Watershed designated as an "Undeveloped River Corridor" by National Park Service standards for the purpose of a nationwide inventory of Wild and Scenic Rivers (Green River Preservation Alliance, 1996).



The Green River Watershed provides many opportunities for recreational use. Swimming, fishing, whitewater boating, hiking, biking, horseback riding, hunting, cross country skiing and snowmobiling are popular and common in the watershed.

The Massachusetts Department of Environmental Protection has given the Green River a Class B, Cold Water Fishery, High Quality Water designation from the Vermont-Massachusetts border to the Greenfield Wastewater Treatment Plant. From the Wastewater Treatment Plant to its confluence with the Deerfield River, the Green River is designated a Class B, Cold Water Fishery (Mass. DEP website, 2002). The Green River is listed on the Massachusetts DEP Section 303 (d) List of Waters for 1998 from the Vermont border to the Greenfield Wastewater Treatment Plant due to metals, pathogens and other unknown causes.

Table 4-3: Summary Table of Testing Results for the Green River – Massachusetts Segments

Location	Aquatic Life	Fish Consumption	Primary Contact (e.g. Swimming)	Secondary Contact (e.g. Boating)	Overall Ranking of Segment
Vt. state line to the Greenfield Wastewater Treatment Plant Length – 15.6 miles	Not Available				Class B
Greenfield Wastewater Treatment Plant to confluence with the Deerfield River. Length – 0.5 miles	Non –Support <i>Due to metals, ammonia, and unknown factors. Chlorine also threatens to cause impairment to this segment.</i>	Not Assessed	Non-Support	Partial Support	Class B

Source: Ma. Dept. of Environmental Protection, Deerfield River Watershed Assessment – Draft 1995/1996; Ma. DEP, Ma. Section 303d List of Waters, 1998; Ma. DEP, Ma. Surface Water Quality Standards, 2000.

Surface Water Resources in the Green River Watershed (sub-watershed of the Deerfield River)

Johnson Brook

Johnson Brook originates in the uplands east of Prolovich Road in the southeastern section of Colrain. It flows northeastward to its confluence with the Green River.

Stafford Brook

Stafford Brook is a tributary of Johnson Brook originating near the Brick School Cemetery.

Workman Brook

Workman Brook originates in the uplands east of Van Ness Road in the southeast corner of Colrain. It flows easterly to its confluence with the Green River.

C.2 Class A Waters

In the Town of Colrain, the Fox Brook Reservoir and its tributaries have been designated as Class A water sources by the Massachusetts Department of Environmental Protection. As such, these waters can be used as public water supplies. The Fox Brook Reservoir is used by the Shelburne Falls Fire District and serves Shelburne, Buckland, and a few residents of Colrain. Class A water sources are also considered excellent habitat for fish, other aquatic life and wildlife. They have aesthetic value and are suitable for recreation purposes compatible with their designation as drinking water supplies. These waters are designated for protection as Outstanding Resource Waters under Massachusetts 314 CMR 4.04 (Mass. DEP website; 2002).

C.3 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, while 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.

Information regarding 100-year floodplains in Colrain have been obtained from: 1) the North River Flood Plain Management Study; and 2) the National Flood Insurance Map (1980).

According to the North River Flood Plain Management Study (Soil Conservation Service, 1990), major flooding occurred on the North River and its East and West Branches five times during the past 145 years, the most recent of which was in 1987. These events were of such severity that dams, structures and roadways were destroyed. Ice jams have also caused flooding along these rivers. Foundry Brook, according to the study, has also been known to experience minor flooding. The Town of Colrain does not have flood control structures within its borders and thus utilizes land use regulations, which control building in areas with risk of flooding.

The North River Flood Plain Management Study states that the 100-year floodplain covers an area of approximately 600 acres along the North River and its Branches or



about 18 percent of the river corridor. Within Colrain's Zoning Bylaws, a Flood Plain Area has been established which speaks to compatible land use and building requirements within the 100-year floodplain. This, according to the study, has been maintained and the study supported its continued use.

The National Flood Insurance Map (1980) shows that a 100-year floodplain also exists along the Green River at Green River Road.

C.4 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 wetland 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 Colrain's wetlands can be found in its uplands in isolated forested areas. Some of these wetlands are mapped by the National Wetlands Inventory (NWI).

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 Colrain, NHESP has identified fifty-seven 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

C.5 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, including those in Colrain, 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, Colrain contains two areas considered to be large high-yield aquifers, defined as an aquifer with the potential to provide a pumping volume 25 to 1,000 gallons per minute. These two areas are along the East Branch and the North River. The high yield aquifer along the East Branch extends from Fairbanks Road to Greenfield Road. The second high yield aquifer extends from the confluence of Foundry Brook with the East Branch to its confluence with the main stem of the North, and then down to the North River's confluence with Johnson Brook. (*See Water Resources Map*).

Colrain'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, the following areas support low-yield aquifers:

- The remaining sections along the East Branch and the North River;
- The entire length along the West Branch;
- Two areas along Spur Brook and two areas just north of Spur Brook;
- The length of Taylor Brook to its confluence with an unnamed stream just west of North Catamount Hill Road Number One;
- An area approximately one half mile long paralleling Foundry Brook beginning at Foundry Village and traveling north;
- From the town boundary with Shelburne Falls along Shelburne Line Road to Jurek Road; and
- A few small areas north of Johnson Brook.

The areas that contribute to public water supply wells are known as recharge areas. The Massachusetts Department of Environmental Protection strictly regulates an area within a radius of 100 to 400 feet of public water supply wells, known as the "Zone I," and land uses in this area are restricted to water supply related activities only. Primary recharge areas are determined by hydrological studies involving pump tests and wells that monitor the level of groundwater in proximity to the public water supply well. The Colrain Fire

District's well has a Zone 1 radius of 347 feet. It does not own the land west of the pumping station across the North River, however the Public Water Supply System Description (DEP files) indicates there are no land uses that pose a threat to the water supply. The Interim Wellhead Protection Area (IWPA) surrounding this well has a radius of 1,392 feet. The Zone I of the Griswoldville Water District's well on Call Road has a protective radius of 333 feet and the IWPA has a radius of 800 feet. According to DEP, neither of these areas have land uses which pose threats to the groundwater quality. The primary source of water for the Shelburne Falls Fire District is a groundwater source also located on Call Road in Colrain. The Zone I of this well has a protective radius of 400 feet and a Zone II approximately two miles in length along the North River. The Zone II begins just past Component Building Systems, Inc. to approximately 750 feet past the well at the U.S. Geological Survey gauging station. A Zone II is that area of an aquifer that contributes to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at approved yield with no recharge from precipitation) (Mass. DEP; 2001).

C.6 Surface Water Reservoirs

The Colrain Fire District #1 maintains a surface water source for emergency purpose only. This source consists of an upper reservoir and a lower reservoir, and is located off Greenfield Road. The upper reservoir is three acres in size with a storage capacity of 11.5 million gallons. The lower reservoir serves as an intake reservoir and has a storage capacity of 0.5 million gallons.

The Fox Brook Reservoir located north of Call Road in Colrain is an emergency water source for the Shelburne Falls Fire District. The reservoir has a surface area of three acres and a storage capacity of twelve million gallons.

C.7 Potential Sources of Public and Private Drinking Water Supply Contamination

Potential sources of contamination of public and private wells include septic systems, sub-surface fuel tanks, manure piles, improper use, storage and disposal of hazardous materials, herbicide runoff from farmland, utility rights-of-way, and state highway vegetation control, and road runoff.

D. VEGETATION

Plants are a critical component of ecosystems in Colrain. 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 81.2 percent of the Colrain's total land area and are one of the town's most important renewable natural resources. The town's forests are diverse, including Northern hardwoods and conifers; high-terrace floodplain forests; rich, mesic forests; and cobble bar forests. This section describes vegetated areas in town and their ecological and economic significance.

D.1 Forests

Northern Hardwood Forest

Colrain is located in the Northern Hardwoods Region (USDA, 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 tremuloides* and *P. grandidentata*), eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*) and red oak (*Quercus rubra*).

High-Terrace Floodplain Forest

The high-terrace floodplain forests can also be found in Colrain. 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 (*Carpinus 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. The Natural Heritage and Endangered Species Program (NHESP) has noted that two rare plants and two rare vertebrates can be found in the high-terrace floodplain forests in the Town of Colrain. These include the Black Maple (*Acer nigrum*) and the Barren Strawberry (*Waldsteinia fragarioides*), and the Jefferson Salamander (*Ambystoma jeffersonianum*) and the Wood Turtle (*Clemmys insculpta*). (See Tables 4-5 and 4-6.)

D.2 Unusual Natural Communities

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement has noted the Town of Colrain 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 Colrain. 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*), butternut-hickory (*Carya cordiformis*), and sweet birch (*B. lenta*) also occur in small numbers.

Rare plants known to occur in Colrain's rich, mesic forests include the Barren Strawberry (*Waldsteinia fragarioides*), a member of the Rose family. It prefers rich wooded areas or semi-open banks, but also does well in cool, wooded areas and in sandy, dry soil. Woodland Millet or Millet Grass (*Milium effusum L.*) occurs on steep slopes within the rich, mesic forest, where the soil has a high calcium content. The Hooded Ladies'-tresses (*Spiranthes romanzoffiana*) are also a rare species, which can be found in this community.

Acidic Graminoid Fen

The Acidic Graminoid Fen is an uncommon natural community found in Colrain, which forms along pond margins, slow-moving streams, and at the headwaters of streams or in isolated valley bottoms without inlet or outlet streams. It is a wetland community composed of incompletely decomposed organic matter. The Slender Cottongrass



(*Eriophorum gracile*), a rare species considered to be threatened in Massachusetts, can be found in the acidic gramminoid fens.

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. The Climbing Fumitory (*Adlumia fungosa*), a rare species known to occur in Colrain, may be found in this environment.

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 riverbends 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* spp.), 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.

Cobble Bar Forest

The Cobble Bar Forest is a variant of the high-energy riverbank community. It is characterized by open forests growing on sandy cobble bars on the upstream ends of islands. These open forests are dominated by sycamore (*Platanus occidentalis*) with associated cottonwood (*Populus deltoids*) and silver maple (*Acer saccharinum*). American elm (*Ulmus americana*) is also present. Exotic species usually dominate the understory. Cobble bar forests provide habitat for riverine odonates (dragonflies and damselflies).

D.3 Agricultural Land

In 1997, agricultural land in Colrain, which includes cropland, pastureland, orchards and nurseries, comprised 11.6 percent of the town's total land area. The U.S. Census of Agriculture does not provide municipal-level data for the amount of land in farms. Colrain's agricultural land is located primarily along the Green River, the North River and its East and West Branches and in the southeastern-most corner of Colrain.

Table 4-4: Farms of Colrain, Massachusetts

Family	Farm Name	Year Established	Farm Size in Acres	Primary Products
C. & S. Hager	Hager Brothers Farm	1738	675	Maple products, dairy, timber
K. Shearer	Colrain Dairy Farm	1929	240	Dairy
R. Coombs	Coombs Hill Farms	1752	270	Dairy
S. Herzig	West Branch Farm	1900	130	Dairy
S. Sullivan	Brown Homestead Farm	1990	Using 200, owns 56	Dairy
J. & T. Maloney	West County Cider	1984	60	Hard cider
B. & C. Ramirez	Keldaby Farm	1990	14	Mohair and breeding stock, angora goats
K. Avery	Fort Morrison Farm	1855	400+	Dairy, breeding stock
D. Roberts	Dar-Ridge Farm	1940	265	Dairy
A. Emond	West Branch Organic Farm	1993	5	Cut flowers, produce, eggs
H. Purington	Woodslawn Farm	1784	370	Dairy
R. Lively	Sunrise Farms	1890	275/Heath, 175/Colrain	Maple syrup, timber, beef
D. Scranton	Windswept Valley Farm	1963	220	Dairy
D. Shearer	Pine Hill Orchards	1920	100	Apples, cider, peaches, blueberries, plants
M. & S. MacKusick	B&B and Barn	1993	650	Hay, goat meat, periodic logging, & recreation (horse riding)
D. Wheeler	Foxwood Iris Farm	1983	1	Iris
J. Hillman	Unknown	Unknown	Unknown	Unknown

Source: Contacts of local farmers by Open Space and Recreation Plan Member, Sarah Johnson, 2003.

According to the Massachusetts Department of Agricultural Resources (DAR), there are eight dairy farms in the Town of Colrain. Two of these farms have been designated Massachusetts Century Farms for having been owned or worked by the same family for at least one hundred years. They are Coombs Hill Farm in existence since 1752 and Woodslawn Farm in existence since 1784. In addition, the DAR noted there are nine farms in the Agricultural Preservation Program. Table 4-4 lists information describing seventeen farms in Colrain. The data was gathered by members of the Colrain Open Space and Recreation Planning Committee and includes the farming family, each farm's name, the year it was established, its size in acres, and the farm's primary products.



D.4 Rare, Threatened and Endangered Plant Species

The Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement has designated several “Priority Habitat” areas in the Town of Colrain. 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:

- Along the banks of the East Branch;
- Along the banks of the West Branch from the Heath town line to Clark Road (approx.), and from Adamsville to the confluence with the East Branch;
- Along the banks of Taylor Brook from Hill Road (approx.) to the confluence with the West Branch;
- Along the banks of and land between, Holden and Houghton Brooks to their confluence with the North River;
- Along the banks of Johnson Brook from the intersection of Greenfield Road and Jurek Road to just past Shelburne Line Road; and
- Along the banks of the Green River from the Vermont border to Stewartville and from the East Colrain Church to three-fourths of a mile beyond the Stafford Brook’s confluence with the Green River (approx).

(See *Open Space Map*).

Table 4-5: Rare Plant Species in the Town of Colrain

Scientific Name	Common Name	State Status
<i>Hydrophyllum canadense</i>	Broad Waterleaf	Endangered
<i>Spiranthes romanzoffiana</i>	Hooded Ladies’-tresses	Endangered
<i>Carex tuckermanii</i>	Tuckerman’s Sedge	Endangered
<i>Adlumia fungosa</i>	Climbing Fumitory	Threatened
<i>Cryptogramma stelleri</i>	Fragile Rock-brake	Threatened
<i>Eriophorum gracile</i>	Slender Cottongrass	Threatened
<i>Milium effusum</i>	Wooland Millet	Threatened
<i>Ophioglossum pusillum</i>	Adder’s Tongue-fern	Threatened
<i>Platanthera dilatata</i>	Leafy White Orchis	Threatened
<i>Sanicula canadensis</i>	Canadian Sanicle	Threatened
<i>Acer nigrum</i>	Black Maple	Special Concern
<i>Alnus viridis</i> spp. <i>crispa</i>	Mountain Alder	Special Concern
<i>Carex hitchcockiana</i>	Hitchcock’s Sedge	Special Concern
<i>Cypripedium reginae</i>	Showy Lady’s-slipper	Special Concern
<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	Special Concern
<i>Panax quinquefolius</i>	Ginseng	Special Concern
<i>Waldsteinia fragarioides</i>	Barren Strawberry	Special Concern

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

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 Colrain (See Table 4-5). 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).

E. FISHERIES AND WILDLIFE

Colrain'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 Habitats" and "Supporting Natural Landscapes". 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 the Town of Colrain, there are several BioMap areas. A large area of Core Habitat is located in the southwest corner of Colrain and includes Catamount State Forest. This Core Habitat area is also buffered by Supporting Natural Landscape areas. Two areas in the northeast and southeast corners of Colrain are also areas of Core Habitat. Both of these areas include sections of the Green River, which provides habitat for the Longnose Sucker, a species of special concern (NHESP; 2002.) Much of the northern, eastern and middle sections of Colrain are Supporting Natural Landscapes.

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

The Town of Colrain contains a significant amount of upland and floodplain habitat. The forests in Colrain consist of large unbroken tracts of dense forest, allowing for good species movement within the town and the surrounding region.



Individuals of the following species of wildlife have been observed in Colrain 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. This source has been augmented with information provided by members of the Colrain Open Space Planning Committee and the general public. It is by no means a complete inventory of all species that may be found in Colrain.

E.1.1. Amphibians

These species are found in forest, wetland, and open upland habitats and require a home range 1-10 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, Pickerel Frog, Jefferson Salamander, Spotted Salamander, Northern Dusky Salamander, Mountain Dusky Salamander, Northern Two-lined Salamander.

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

Spotted Salamander

E.1.2. Fish

These species are found in Colrain:

Salmon, Yellow Perch, Pickerel, Rainbow Trout, Brook Trout, Brown Trout, Small Mouthed, Bluegill, Bullhead/Horn Pout.

E.1.3. Reptiles

These species are found in forest, wetland, and open upland habitats and require a home range 1-10 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, Northern Black Racer, Northern Brown Snake.

This species is found in forest, wetland, and open upland habitats and requires a home range 11-50 acres in size:

Common Snapping Turtle, Midland Painted 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.1.4. 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, White-eyed Vireo, Blue-winged Warbler, Pine Warbler, Tennessee Warbler, Nashville Warbler, Northern Parula, Yellow Warbler, Chestnut-sided Warbler, Black-throated 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, Hooded 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, White-winged Crossbill, European Starling, Sora, Killdeer, Spotted Sandpiper, Common Snipe, Northern Mockingbird, Eastern Phoebe, Mourning Dove, Pine Siskin, Northern Waterthrush, Virginia Rail, Eastern Kingbird, Pine Siskin, House Finch, House Sparrow, Fox Sparrow, Red-winged Blackbird, Great-crested Flycatcher, Pied-billed Grebe, Red-breasted Merganser, American Bittern, Least Bittern, Black-crowned Night Heron, Northern Bobwhite.

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, Yellow-billed Cuckoo, Common Nighthawk, Whip-poor-will, Northern Rough-winged Swallow, Bank Swallow, Barn Swallow, Purple Martin, Red-breasted Nuthatch, White-breasted Nuthatch, Pine Grosbeak, Brown Creeper, American



Woodcock, Horned Lark, Muted Swan, Canada Goose, Eastern Meadowlark, Swainson's Thrush.

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, Red-shouldered 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, Gray Partridge, Spruce Grouse, and Osprey.

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

American Tree Sparrow, Bohemian Waxwing, Northern Shrike, Common Redpoll, Snowy Owl, Snow Bunting, White-crowned Sparrow, Boat-tailed Grackle, Snow Goose, Rough-legged Hawk.

E.1.5. Mammals

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

Eastern Cottontail, New England Cottontail, Snowshoe Hare, Eastern Chipmunk, Gray Squirrel, Red Squirrel, Northern Flying Squirrel, Beaver, Deer Mouse, White-footed Mouse, Shrew, Northern Short-tailed Shrew, Least Shrew, Masked Shrew, Smoky Shrew, Hairy-tailed Mole, Meadow Jumping Mouse, Woodland Jumping 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, Long-tailed Weasel.

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, Mink, Mountain Lion.

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

Little Brown Myotis, Big Brown Bat, Red Bat, Hoary Bat, Keen's Myotis.

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 Colrain. The Estimated Habitats of Rare Wildlife are located in the same areas as noted for the Priority Habitats earlier in this section, with the exception of the section on the Green River from the East Colrain Church to just beyond Stafford Brook's confluence with the Green River.

Table 4-6: Rare, Threatened and Endangered Wildlife Species found in Colrain

Scientific Name	Common Name	State Status
<i>Invertebrates</i>		
<i>Boyeria grafiana</i>	Ocellated Darner	Special Concern
<i>Gomphus borealis</i>	Beaverpond Clubtail	Special Concern
<i>Vertebrates</i>		
<i>Phoxinus eos</i>	Northern Redbelly Dace	Endangered
<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	Special Concern
<i>Catostomus catostomus</i>	Longnose Sucker	Special Concern
<i>Clemmys insculpta</i>	Wood Turtle	Special Concern
<i>Gyrinophilus porphyriticus</i>	Spring Salamander	Special Concern

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

These habitats provide for wildlife species that are endangered, threatened and of special concern. Colrain’s rare, threatened and endangered wildlife species are listed in Table 4-6.

E.3 Conserving Colrain’s Biodiversity

There are two concepts that can be used to help explain Colrain’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 Colrain 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 Colrain 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 Colrain 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 Colrain.

How will the Town of Colrain 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 Colrain 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 Colrain.

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

The characteristics that allow a stranger to distinguish Colrain 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 Colrain residents would agree represent the essence of Colrain's character.

In many ways the history of Colrain--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 Colrain 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 Colrain is to provide a basis for setting resource protection priorities. To this end, this 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 (See Table 4-7). 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.

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. 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).

It should be noted that within the Town of Colrain there are several old Native American trading routes and military highways. Due to the fact that they cross predominantly private lands, the Open Space and Recreation Committee felt it would be inappropriate to display them on the Scenic Resources and Unique Environments Map at this time. However, if the town became interested in protecting the historical and recreational value of these trails by purchasing easements from willing landowners, a first step towards protection would entail mapping and more detailed documentation.



Table 4-7: Significant Scenic/Ecological/ Recreational/and Historic Landscapes/Environments in Colrain

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
	<i>Stream Corridors</i>			
1	North River	Public Drinking Water Supply; Endangered Species	Swimming, Fishing, and Kayaking	Historic mills and bridges; a source of process water for BBA Non-Wovens
2	McClellan Brook	Recharge Area for a Drinking Water Supply		
3	Fox Brook	Public Drinking Water Supply	Fishing	Works Progress Administration and the Civilian Conservation Corps built stonewalls and foundations in the area
4	Johnson Brook (North River)	Yes	Hiking	
5	Meadow Brook	Yes	Hiking	Historic mill site
6	Holden Brook	Vernal Pools		
7	Houghton Brook	Long Nose Sucker Fish (endangered); Drains Large Swamp System	Fishing	The "Sheep-dip," an area historically used to wash sheep before shearing
8	East Branch of the North	Endangered Species	Important fishery, Fishing, Kayaking, and swimming	Historic mills
9	Spur Brook	Yes	Important fishery	Nice stone dam and grist mill
10	Foundry Brook	Yes	Important fishery, Hiking	Historic mills
11	West Branch of the North River	Yes	Important fishery, Fishing, Swimming	Old mills and industries
12	Vincent Brook	Yes	Trout fishing	
13	Willis Brook	Beavers		
14	Roberts Brook North	Yes	Fishing	
15	Roberts Brook South	Public Drinking Water Supply-- Water Runs into Lower Reservoir		
16	Tissdell Brook	Yes	Fishing and Swimming	Dam and old mill sites
17	Taylor Brook	Yes	Swimming	Dam and old mill site
18	Cary Brook	Yes	Hiking	200-yr. old stone bridges, old milk house and old dam
19	Green River	Drinking Water Supply for Greenfield; Endangered Species	Fishing and Swimming	Dams and old mill sites
20	Johnson Brook (Green River)	Beaver Ponds and Native Trout	Fishing	
21	Stafford Brook	Yes		
22	Workman Brook	Yes		
	<i>Ponds and Lakes</i>			

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
23	McLeod Pond	Undergoing Eutrophication; Diverse Habitats	Picnicking, Swimming Sunbathing, Fishing and Canoeing.	Old cellar holes; used to be a haying meadow
24	Beaver Ponds	Yes		
25	Swamp (No name)	Yes		
26	Ash Swamp	Yes		
	<i>Recreation Areas</i>			
27	H.O. Cook State Forest	Yes	Hiking, Hunting, Fishing, Snowmobiling, and Camping.	Historic Recreational Landscape; a C.C.C. Forest Camp
28	Catamount State Forest	Unique Caves; Beaver Ponds; Endangered Species; Vernal Pools	Hiking and Hunting	Historic Recreational Landscape; Site of the first flag flown over a schoolhouse; Traversed by Native American trade routes and old military roads; An historic settlement of 70 families
29	Catamount Wildlife Management Area	Unique Caves; Beaver Ponds; Endangered Species; Vernal Pools	Hunting	
30	Green River Access Area	Yes	Potential	
	<i>Historical Agricultural Landscapes</i>			
31	Nelson Road			Yes
32	Route 112			Yes
33	Adamsville Road			Yes
34	EW Clark Road and Christian Hill Road			
35	Shelburne Line			Yes
36	Wilson Hill Road			Yes
37	Nelson Purington Road			Yes
38	Heath Road			Yes
39	Coombs Hill Road			Yes
	<i>Historical Religious Landscape</i>			
40	East Colrain Chapel			Yes
41	Methodist Church			Yes
42	St. John's Church			Yes
43	First Baptist Church			Yes
44	Second Baptist Church			Oldest church in Colrain, established in 1799.



Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
45	Brick Meeting House		Yes	Formerly a Congregational Church and also served as town office
	<i>Historical Community Development/ Conservation/ Science/ Industrial Landscape</i>			
46	Red Mill			Made boxes
47	Colrain Center		Museum, Restaurant and Beautiful Library	Still active old commercial center; historic buildings; the end of the trolley line
48	Allegedly a commemorative site for Native Americans attacked by Europeans			
49	Factory Village, Adamsville			Cider mill, sawmill, fulling mill and gimlets
50	Foundry Village	Along North River.		Site of early cider and vinegar mill, foundry and smith shops
51	Factory Village, Stewartville, Green River Rd.			Yes
52	Factory Village, Griswoldville, Rte.112	Along North River.		Early mill site
53	Factory Village, Shattuckville	Along North River.		Early mill site
54	Factory Village, Lyonsville, Rte.112	Along North River.		Some 19 th century buildings remain
55	Brick School		Yes	Yes
56	Elm Grove Factory Village			Yes
	<i>Historical Transportation Landscape</i>			
57	Route 112	Scenic Corridor along the North River		Yes
58	Trolley Line from Buckland to Colrain Center			Yes
	<i>Unusual Geologic Features</i>			
59	Road cut, York Road	Yes		
60	Road cut, Greenfield Road	Yes		

Map #	Scenic Resources	Ecological/ Geological Resources	Recreational Value	Historical Value
61	Catamount cave and dens	Yes	Hiking Destination	Historic use – Methodists used cave for revival meetings; Used for church meetings
	<i>Scenic Views</i>			
62	Views from Ridgetops			
63	North River Valley from Colrain Center north to Vermont line.			
64	View to the west from top of Colrain Mountain.			
	<i>Other</i>			
65	Old Abutments for York Road across Foundry Brook			Yes
66	Dude Ranch			Yes
67	Fort Morrison, French and Indian War			Yes
68	Fort Monument, French and Indian War			Yes
69	South Fort Morris, French and Indian War			Yes
70	Fort Lucas, French and Indian War			Yes

Source: Franklin County Rural Landscape Preservation Plan Report, Franklin County Commission, 1992; Town of Colrain Residents.

G. ENVIRONMENTAL PROBLEMS

According to the Open Space and Recreation Planning Committee, there are two main types of environmental problems in Colrain: non-point source pollution and the impacts of development. 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, Colrain 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.

Agricultural activities can also produce pollutants. When manure is spread on fields in the spring months, runoff from snow melt and spring rain can result in overland flow of nutrients into brooks and streams at levels that can interfere with normal ecosystem processes. There is more of a chance of runoff pollution from spread manure than there



is from leaching, which can happen when piles of manure are left on permeable soil for extended periods of time in warmer months. Spreading manure on frozen, snow-covered ground has the greatest potential for runoff pollution. Incorporation of manure within twelve hours of application on the soil decreases the likelihood of lost nutrients through leaching, runoff and volatilization. Improper disposal of livestock manure by backyard farmers has increased in the watershed. Many of these individuals have limited land to get rid of their manure on, so it tends to accumulate in the least desirable land on their property, namely wetlands or along stream banks (Rita Thibideau, Natural Resource Conservation Services, personal communication, 2003).

Other pollution problems come from road runoff directly impacting watercourses through curb cuts. Gravel operations can have negative impacts on groundwater when permitted to harvest materials too close to the groundwater table. Logging operations can also contribute to erosion problems in the woodlands if Best Management Practices are not followed (Rita Thibideau, personal communication, 2003).

Erosion is a water shed-wide type of non-point source pollution that is impacted by local land use decisions. A brief summary of a Soil Conservation Service (now Natural Resource Conservation Service) study conducted back in the late 1980s indicated that erosion and sedimentation is occurring through out the Deerfield River Watershed. The extensive accumulation of sediment under the Rt. 112 bridge is the result of the North River's high velocity channel emptying its bed load in the floodplain. The North River has lost some of its pools and riffles above the bridge, which had helped to control the sediment buildup. A few problem areas were studied and addressed. Installations of bioengineering techniques were used to address erosion along stream banks. Most of this work has survived. Some of the problems contributing to the erosion are the practice of mowing, grazing and tilling land directly adjacent to the stream. Another example involves the erosion of the clay bank of Taylor Brook, which flows into the West Branch. Removal of vegetation along streams has a negative impact on the stability of the stream bank. A vegetative buffer helps to stabilize the stream bank and provides shade for the stream (Rita Thibideau, personal communication, 2003).

The most recent study that is about to be undertaken by the USDA Natural Resources Conservation Service Interdisciplinary Resource Team (NRCS IRT) will look at stream bank erosion, sediment accumulation under the bridge, surface runoff from the Colrain school parking lot and existing buffers. A combination of measures may be used to control some of these issues such as bioengineering, re-establishment of a vegetative buffer and in stream deflectors in the area of the Rt. 112 bridge (Rita Thibideau, personal communication, 2003).

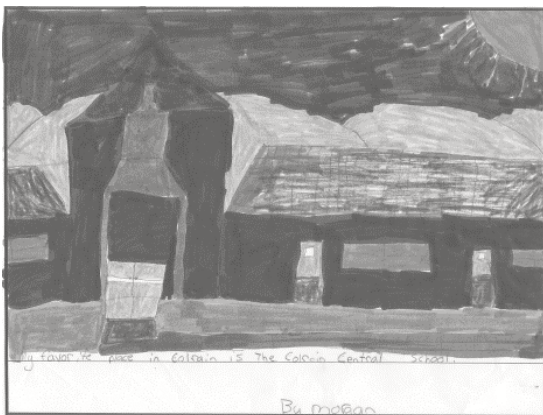
Two other land use practices and activities that can also increase non-point source pollution are road salt and off-road vehicle use. The use of wintertime de-icing materials can result in road salt runoff and groundwater contamination. For example, the Deerfield Fire District has lost use of its Wapping Well due to sodium contamination from road salt use along Rte. 5/10. Finally, off-road vehicle use in areas with shallow, wet, and unstable

soils can result in serious erosion and sedimentation of wetlands and streambeds, which results in habitat alteration and a reduction in local biodiversity.

Another type of environmental problem relates to development of the built environment. Unplanned development along back roads is seen as potentially threatening to the rural character that many Colrain residents have come to cherish. Although Colrain's zoning is designed to promote village residential, commercial and industrial centers, rural agricultural areas, and forested landscapes, sprawl of roadside frontage lots is the current development pattern occurring in town today. Over time, this development pattern would diminish the differences between the villages and rural areas of town and could result in a reduction in available clean drinking water, in the town's biodiversity, and in active agricultural businesses.

Buildings in the village centers in need of serious repair are considered to be a visual blight and as such, an environmental problem. In addition, cleanup and redevelopment of abandoned industrial sites known as "brownfields" is an important element of restoring economic viability and environmental health of the town's villages.

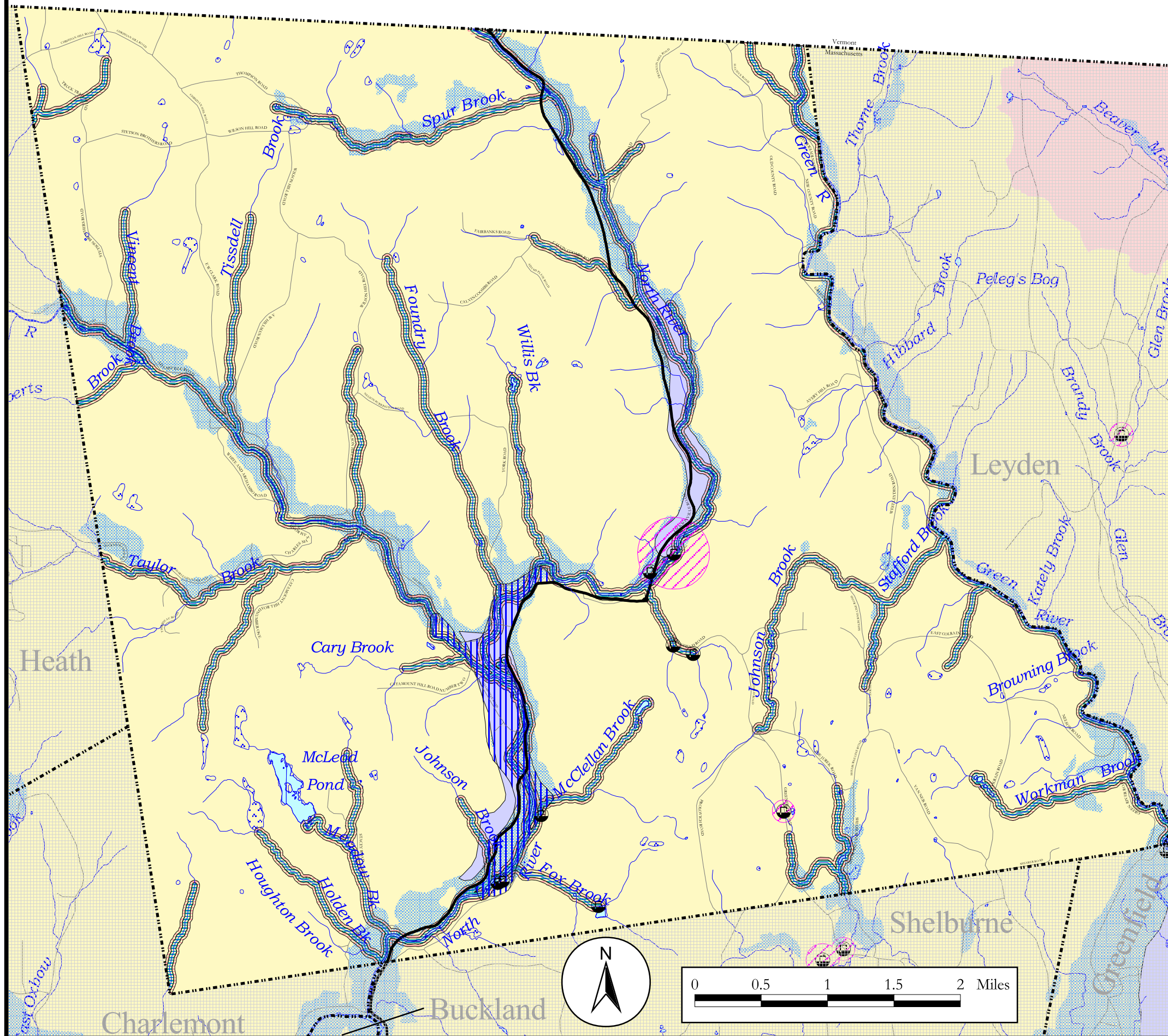
The success of efforts to address urban blight and promote revitalization in village areas is important to the future of the town's open space and natural resources. Colrain's villages have many natural and cultural resources that make them attractive places to live: historic buildings, a mix of residential and commercial spaces, and proximity to rivers and forests. Improving infrastructure and the appearance of buildings within the villages can help draw people to these historic settlements, and possibly reduce some of the pressure to develop more rural areas of town. Use of these areas for further development would need to resolve any existing septic problems that are currently an issue.



Town of Colrain

Open Space and Recreation Plan

Water Resources



Legend

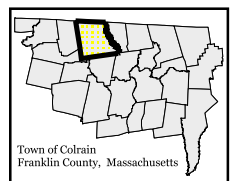
- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Water body
- Deerfield River Watershed
- Connecticut River Watershed
- Public water supply sources
- National Wetlands Inventory wetland
- Interim Wellhead Protection Area
- Surficial Geology: sand/gravel, floodplain alluvium (low yield aquifer)
- Aquifer yield >200 gpm
- Zone II - Conceptual Delineated Water Supply Recharge Area
- River Protection Act**
- 0-100 feet from river bank
- 100-200 feet from river bank

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, pond, National Wetlands Inventory, zone II, interim wellhead protection area, public water supply, surficial geology, major basin, River Protection Act data provided by MassGIS.

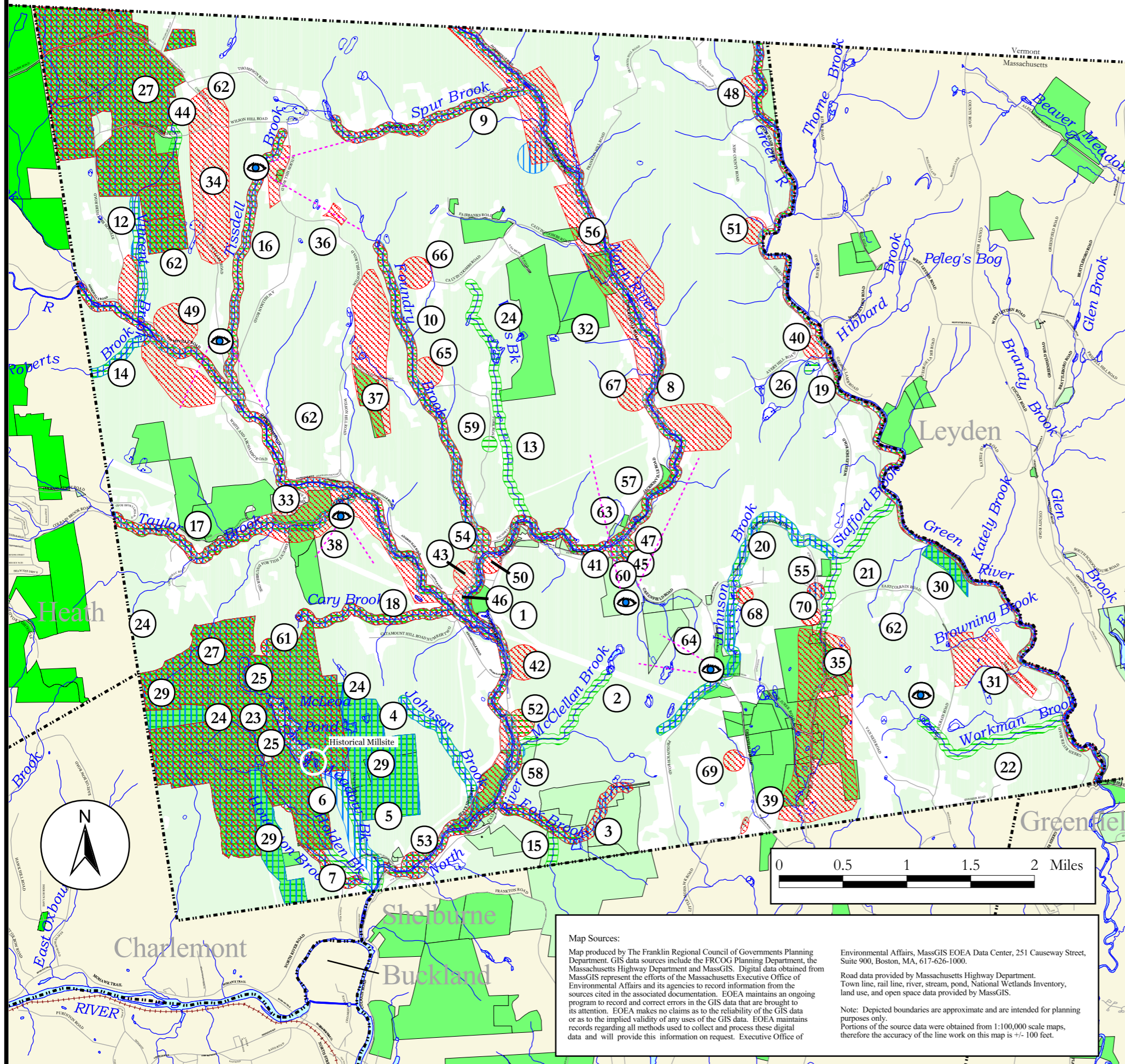
Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet.



Town of Colrain

Open Space and Recreation Plan

Scenic Resources and Unique Environments



Map #	Scenic Resources
Stream Corridors	
1	North River
2	McClellan Brook
3	Fox Brook
4	Johnson Brook (North River)
5	Meadow Brook
6	Holden Brook
7	Houghton Brook
8	East Branch of the North
9	Spur Brook
10	Foundry Brook
11	West Branch of the North River
12	Vincent Brook
13	Willis Brook
14	Roberts Brook North
15	Roberts Brook South
16	Tissdell Brook
17	Taylor Brook
18	Cary Brook
19	Green River
20	Johnson Brook (Green River)
21	Stafford Brook
22	Workman Brook
Ponds and Lakes	
23	McLeod Pond
25	Swamp (No Name)
24	Beaver Ponds
26	Ash Swamp
Recreation Areas	
27	H.O. Cook State Forest
28	Catamount State Forest
29	Catamount Wildlife Management Area
30	Green River Access Area
Historical Agricultural Landscapes	
31	Nelson Road
32	Route 112
33	Adamsville Road
34	EW Clark Road and Christian Hill Road
35	Shelburne Line
36	Wilson Hill Road
37	Nelson Purington Road
38	Heath Road
39	Coombs Hill Road
Historical Religious Landscape	
40	East Colrain Chapel
41	Methodist Church
42	St. John's Church
43	First Baptist Church
44	Second Baptist Church
45	Brick Meeting House
Historical Community Development/ Conservation/Science Industrial Landscape	
46	Red Mill
47	Colrain Center
48	Allegedly a commemorative site for Native Americans attacked by Europeans
49	Factory Village, Adamsville
50	Foundry Village
51	Factory Village, Stewartville, Green River Rd.
52	Factory Village, Griswoldville, Rte.112
53	Factory Village, Shattuckville
54	Factory Village, Lyonsville, Rte.112
55	Brick School
56	Elm Grove Factory Village
Historical Transportation Landscape	
57	Route 112
58	Trolley Line from Buckland to Colrain Center
Unusual Geologic Features	
59	Road cut, York Road
60	Road cut, Greenfield Road
61	Catamount caves and den
Scenic Views	
62	Views from Ridgetops
63	North River Valley from Colrain Center north to Vermont line.
64	View to the west from top of Colrain Mountain.
Other	
65	Old Abutments for York Road across Foundry Brook
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67	Fort Morrison, French and Indian War
68	Fort Monument, French and Indian War
69	South Fort Morris, French and Indian War
70	Fort Lucas, French and Indian War

Legend

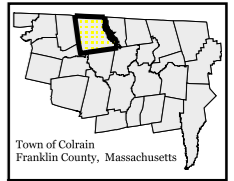
- Town Line
- Rail Lines
- Roads
- Major roads
- Streams and Rivers
- Water body
- National Wetlands Inventory
- Forest

Scenic and Unique

- Scenic vista with directional indicator
- Historic area
- Recreational area
- Ecological area

Open Space

- Open Space with Permanent Protection
- Open Space with Limited Protection



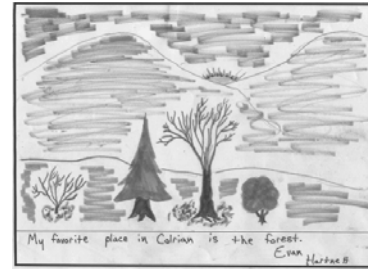
Map Sources:
 Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental 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, pond, National Wetlands Inventory, land use, and open space data provided by 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.



SECTION 5



INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Open space in the Town of Colrain consists of farms, forests, parks, and recreation areas under both public and private ownership and management. This section provides a summary of all lands that provide open space, wildlife habitat, agricultural and forest products, watershed protection, scenic landscapes and recreational opportunities that have some level of protection from development. An Open Space Map is located at the back of this section.

In general terms, 'open space' is defined as undeveloped land. In an Open Space and Recreation Plan, the focus is on undeveloped land, which is valued by residents because of what it provides: actively managed farm and forestland; wildlife habitat; protection and recharge of groundwater; public access to recreational lands and trail systems; important plant communities; structures and landscapes that represent the community's heritage; flood control; and scenery. The term 'natural resource' describes the biological and physical components of an ecosystem that people depend on for their existence and for some, their livelihood. These components are surface and ground water, soil nutrients, vegetation, fisheries, and wildlife. Recreational facilities can include open space, parks, and developed areas like tennis courts and swimming pools. Open space and recreation plans typically identify areas of undeveloped land that contain precious natural and recreational resources and prioritizes them for protection.

Open space can be protected from development in several ways that differ in the level of legal protection they provide, the method by which they are protected, and by the type of landowner. When land is considered to be "protected," it is intended to remain undeveloped in perpetuity. This level of protection is ensured in one of two ways: ownership by a state conservation agency, a not-for-profit conservation land trust, or the local Conservation Commission, or attachment of a conservation restriction or similar legal mechanism to the deed.

Land is considered to be "protected" from development when it is owned by the Commonwealth of Massachusetts and managed by a state conservation agency, including the Division of Fisheries and Wildlife (DFW) or the Department of Conservation and Recreation (DCR). Land is also considered "protected" when it is owned by a town and is under the authority of the Conservation Commission, or when it is owned by a land trust for conservation purposes.

A conservation restriction is a legally binding agreement between a landowner (grantor) and a holder (grantee) - usually a public agency or a private land trust, whereby the

grantor agrees to limit the use of his/her property by forfeiting interests in the land (development being one type of interest) for the purpose of protecting certain conservation values. The conservation restriction may run for a period of years or in perpetuity and is recorded at the Registry of Deeds. Certain income, estate or real estate tax benefits may be available to the grantor of a conservation restriction.

There are several types of conservation restrictions. Some protect specific resources, such as wildlife habitat, or surface water. Actively farmed land with prime soils or soils of Statewide Importance may be eligible for enrollment in the state's Agricultural Preservation Restriction (APR) Program. The APR program purchases the development rights and attaches a restriction to the deed, which legally bars development, keeping land available for agriculture.

To develop any parcel of land that is in the APR Program, has a conservation restriction, is owned by a state conservation agency, or is owned by a land trust or a town for conservation purposes, requires a vote by two-thirds of the State Legislature as outlined in Article 97 of the Amendments to the Massachusetts State Constitution. For the purposes of this Open Space and Recreation Plan, cemeteries will also be considered to be permanently protected from development.

This "protection" conveyed by Article 97 does have its limits. The state legislature has, on dozens of occasions, voted to release this protection at the request of local communities, so that conservation land can be used for schools, roads, economic development, or other public projects not related to resource protection. Reforms have been proposed to make this process more difficult. It is important for local advocates of conservation to be vigilant of attempts to remove the "protection" status from open space in the Town of Colrain.

Land in Massachusetts owned by towns or water districts may be considered to have limited protection from development. If a town-owned parcel of land is under the legal authority of the Select Board rather than the Conservation Commission, it is considered to have limited protection from development. The parcel could be called a wildlife sanctuary or a town forest, but not have the long-term protection afforded by Conservation Commission lands. In this case, converting a town forest to a soccer field or a school parking lot could be decided by the Select Board or at Town Meeting. A parcel of land used for the purposes of water supply protection is considered in much the same way. Unless there is a legal restriction attached to the deed or if the deed reads that the land was acquired expressly for water supply protection, the level of protection afforded these types of parcels varies depending on the policies of each community. In most cases the water district would be required to show the Massachusetts Department of Environmental Protection just cause for converting the use of the land. However, this is not an insurmountable hurdle. The Town of Athol recently took their surface drinking water supplies off-line after developing a productive well field. A change in land use around the reservoir from water supply protection to active recreational use may occur. Parcels enrolled in Massachusetts Chapter 61 tax abatement programs are considered to be "temporarily protected" from development. This program offers landowners reduced



local property taxes in return for maintaining land in productive forestry, agricultural or recreational use for a period of time. These “chapter lands” provide many public benefits, from maintaining wildlife habitat and recreational open space to sustaining rural character. Another benefit of the Chapter 61 programs is that they offer towns the opportunity to protect land. When a parcel that has been enrolled in one of the Chapter programs is proposed for conversion to a use that would make it ineligible for the program, the town is guaranteed a 120-day waiting period during which it can exercise its right of first refusal to purchase the property.

The total land area of the Town of Colrain is 27,861.56 acres. The portion of the total land area that is protected as open space is summarized in Table 5-1. The table is divided into two main sections based on type of ownership: private and public. Within each of these major categories, parcels are differentiated by use (farm or forestland), by ownership and management, and by level of protection: “protected,” limited, and temporary.

Table 5-1: Summary Areas of Farmland and Forest Open Space by Ownership and Level of Protection from Development

PRIVATELY OWNED OPEN SPACE	Area in Acres	% Of Total Land Area in Colrain
Farmland		
<i>Protected by Agricultural Preservation Restriction</i>	1,899.02	6.8%
<i>Temporarily Protected under Ch. 61A</i>	5,372.96	19.3%
Forestland		
<i>Protected by Conservation Restriction</i>	30.89	0.1%
<i>Temporarily Protected</i>		
Chapter 61	2,843.77	10.2%
Chapter 61B	<u>2,944.65</u>	<u>10.6%</u>
TOTAL PRIVATELY OWNED OPEN SPACE WITH SOME LEVEL OF PROTECTION	13,091.29	47%
PUBLICLY OWNED OPEN SPACE		
Forestland		
<i>Protected by State Conservation Agencies</i>		
State Department of Conservation and Recreation	2,243.70	8.1%
State Division of Fisheries and Wildlife	416.58	1.5%
<i>Other Publicly Owned Protected Land in the Town of Colrain</i>		
Cemeteries	20.45	0.07%
<i>Land with Limited Protection & Owned by Town of Colrain</i>	105.74	0.3%
<i>Land with Limited Protection & Owned by Fire and Water Districts</i>	<u>444.17</u>	<u>1.6%</u>
TOTAL PUBLICLY OWNED OPEN SPACE WITH SOME LEVEL OF PROTECTION	3,230.64	12%
TOTAL OPEN SPACE WITH SOME LEVEL OF PROTECTION	16,321.93	59%

Source: Colrain Assessors Records and Maps, 2003; and MassGIS Open Space data, 2003.

B. PRIVATELY OWNED PARCELS

Approximately 80 percent of the undeveloped land with some level of protection from development in Colrain is privately owned. Most of this land is owned by private individuals and is either forested or in use for agriculture. There are many advantages to private ownership of open space. Privately owned open space contributes to the town's tax base. When used for farming or forestry, land also generates revenue, jobs, food, and forest products. Some landowners allow access to their property for recreational purposes. Most take pride in their land, which favors good stewardship. Finally, owning land gives people a sense of place. This is particularly true of residents whose families have owned land in Colrain for generations. Land ownership encourages a sense of community and helps contribute to community stability over time.

The major disadvantage of private ownership of open space is that most privately owned land can easily be converted to other uses. Only 6.9 percent of privately owned open space with some level of protection in Colrain has been protected in perpetuity. The remainder is vulnerable to development. Some landowners acquire land specifically for the purposes of development, but others are forced to sell property due to circumstances beyond their control. Aging, the death of a parent or spouse, financial needs of family and rising costs or declining profits of farming and forestry are common reasons why landowners decide to put their property on the market. The high value of land for residential development is both a powerful incentive to sell property, and a formidable obstacle to people who might otherwise want to buy it for agriculture or forestry.

This section provides a detailed inventory of privately owned land in the Town of Colrain and discusses the value of this land for conservation and recreation. Privately owned land provides many public benefits, but it is important to respect private property rights and to remember that use and disposition of this land is ultimately determined by landowners. While many landowners choose to keep their property in farms and forests, it is critical to respect the rights of those who make different choices.

B.1 Privately Owned Agricultural Land

“Protected” farmland constitutes approximately 12 percent of the open space (with some level of protection from development) in Colrain, and 7 percent of the town's total land area. Tables 5-2 and 5-3 display information on those farms in Colrain which have achieved a level of protection from development, including their ownership, management, and farm size.

Approximately 26 percent of Colrain's farms with some level of protection include land “protected” by the Agricultural Preservation Restriction (APR) Program. These restrictions are overseen by the Massachusetts Department of Agricultural Resources (DAR). Information on “protected” farmland in the APR Program in Colrain is included in Table 5-2. Both the owner and manager of the APR properties are the same entity. Their use continues as farmland with state funds (DAR) used to pay farmers for the



development rights to their land. APR properties may have the potential for passive recreational use or for activities such as fishing or hunting, but this is dependent upon the wishes of the landowner. It is important to note that public access to APR properties cannot be assumed, as they are privately owned. All of the APR's in Colrain lie within the town's Rural District, which allows single-family dwellings, some community services, agricultural and recreational uses by right, and other uses by special permit.

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

Owner/Manager	Holder of the Conservation Restriction	Map-Lot	Acres	Recreational/Other Value
Brigham, H., A., & B.	Dept. Agricultural Resources (DAR)	128-1; 129-7	215	Prime Farmland Soils
Hager Bros.	DAR	403-7, 8, 45, 47, 48, 50.1, 51	377	Prime Farmland Soils
Potts, J.B.	DAR	408-20	86	Prime Farmland Soils
Potts, J.B.	DAR	408-18, 22; 417-1, 2, 10, 13	542	Prime Farmland Soils
Franklin Land Trust	DAR	409-4	45	Prime Farmland Soils
Shearer, K. & C.	DAR	414-9.1	13.02	Prime Farmland Soils
Sylvester, S.	DAR	417-3, 36, 36.1	21	Prime Farmland Soils
Jurek, J. & P.	DAR	413-37, 40.1, 41.11	114	Prime Farmland Soils
Scranton, D. & N.	DAR	123-2.1, 2.2; 414-21.1, 24, 25; 421-32	192	Prime Farmland Soils
Sessler, F.	DAR	422-28	62	Prime Farmland Soils
Shearer, D.	DAR	413-24, 26, 27, 28; 414-9.22	86	Prime Farmland Soils
Shearer, K. & C.	DAR	105-8; 413-29, 36, 38.1	146	Prime Farmland Soils
TOTAL			1,899.02	

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003; Mass. Dept. of Agricultural Resources, 2003; and Franklin Land Trust, 2003.

Land enrolled in Chapter 61A is considered to be “temporarily protected.” Approximately 48 percent of Colrain's open space with a temporary level of protection is farmland, including many large parcels with prime farmland soils (see Table 5-3). Land in Chapter 61A can be devoted to the growth of Christmas trees, fruit tree orchards, and sugar maple trees for the production of maple syrup. In some cases, farmland enrolled in Chapter 61A abuts protected land. Conversion of even a small percentage of this land to residential use could affect the viability of farming on the remainder. Location of new homes in proximity to active agricultural operations often results in conflict between new

residents and farmers over the noise, dust, odors, and use of chemicals that are part of normal agricultural practices. Increased commuter traffic on roads in agricultural areas also makes it difficult for farmers to move their equipment between fields.

Much of the land enrolled in Chapter 61A also abuts rivers and streams. While agriculture can have negative impacts on water quality, these impacts can be reduced or avoided through the use of best management practices. When best management practices are observed, agriculture is compatible with watershed protection because it keeps the land open, while development results in conversion of land to impervious surfaces with negative impacts on water quality.

Agricultural lands enrolled in the Chapter 61A program continue to be used as farmland and all lie within the town’s Rural District. No state, town or private funds are necessary to enroll the land in the program. Chapter 61A lands offer much value to the town, even if the farmlands are only “temporarily protected.” The agricultural parcels often contain prime farmland soils, which should be preserved for continuing use. These privately owned open spaces also contribute to the town’s tax base and generate revenue, employment, and food products. In addition, some landowners may allow access to their property for recreational purposes, such as hiking or snowmobiling, however, access should not be assumed as the land is privately owned. Most Chapter 61A landowners take pride in their land, while practicing good stewardship. They help to define a sense of place for Colrain and contribute to community stability over time.

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

OWNER	MAP	LOT	ACRES
Shearer, L.E., Jr.	105	9	1.00
Slowinski, J. & M.	107	1	11.20
Slowinski, E. & T.	107	4	235.00
Slowinski, E. & T.	108	2	14.50
Slowinski, E. & T.	108	3	14.00
Slowinski, J., N., M., & J.	109	8	70.00
Herzig, S. & P.	110	9	7.80
Lively Irrevoc. Real Estate Trust	111	1	44.00
Lively Irrevoc. Real Estate Trust	111	2	36.00
Herzig, S. & P.	112	7	14.00
Herzig, S. & P.	112	8	87.50
Slowinski, M. & J.	113	2.2	13.94
Slowinski, M. & J.	113	3	25.74
Slowinski, M. & J.	113	5	22.81
Slowinski, M. & J.	113	6	13.03
Emond, A.N.	114	4	1.20
Sullivan, J.D.	115	4	13.60
Sullivan, J.D.	115	6	39.50



OWNER	MAP	LOT	ACRES
Emond, A.N.	118	1	2.60
Ramirez, R. & Herbert, C.	119	3	10.20
Mutch, D.D.	119	6	6.60
Ramirez, R. & Herbert, C.	119	7	2.00
Herzig, S. & P.	119	8	12.50
Emond, A.N.	119	9	0.22
Purington, H. & B.	121	6	43.00
Parsons, M.	129	6	15.00
Roberts, D.	130	7	103.50
Avery, K. & E.	132	3	245.50
Avery, K. & E.	132	6	54.00
Healy, J. & E.	401	2	51.00
Maloney, T. & J.	403	10	1.30
Maloney, T. & J.	403	11	10.50
Pelletier, G. & Hogan, K.	403	12	20.50
Maloney, T. & J.	403	14	26.00
Maloney, T. & J.	403	15	7.00
Maloney, T. & J.	403	16	6.10
Hager Bros.	403	21	2.50
Thibodeau, R.	403	33.1	199.38
Lively, R. & M.	403	34	32.00
Hager Bros.	403	35	13.00
Hager Bros.	403	36	2.60
Lively, R. & M.	403	37.2	14.00
Lively, R. & M.	403	37.11	107.80
Lively, R. & M.	403	37.12	6.40
Lively, R. & M.	403	38	7.30
Hager Bros.	403	46	6.70
Hager Bros.	403	49	24.50
Ryan A., F., & R.	404	2.11	8.30
Ryan A., F., & R.	404	4.1	140.00
Purington, H. & B.	404	11	54.00
Purington, H. & B.	404	20	72.00
Giard, D. & R.	404	28	107.00
Bowen, M. Living Trust	405	7.1	80.50
Bowen, M. Living Trust	405	13	2.60
Pascale, R.W.	405	21	20.50
Griffin, T.W. & H.C.	405	33	32.00
Griffin, T.W.	405	33.1	40.00
Ives, D. & N.	405	34	30.00
Ives, D. & N.	405	36	29.00
Ives, D. & N.	405	41	0.49
Ives, D. & N.	405	42	0.28
Griffin, T.W. & H.C.	405	43	104.50
Jameau, M.B.	406	51	10.60

OWNER	MAP	LOT	ACRES
Wang, P. et al	406	56.1	50.30
Cromack, C.	407	2	1.90
Purington, W. & L.	407	13	15.00
Purington, W. & L.	407	15.1	2.50
Cromack, C.	407	30	2.80
Cromack, C.	407	33	10.10
Cromack, C. & R..	407	36	152.50
Standish, J.	407	37	0.64
Cromack, C. & A.	407	47	21.50
Humphreys, L.	408	6	105.00
Purington, H. & B.	408	8	103.00
Purington, H. & B.	408	9.1	105.50
Humphreys, L.	408	15	80.50
Jaffurs, A.	409	2	12.90
Giard, D. & R.	409	6.1	69.50
Dunning, H.	409	11	36.00
Dunning, H.	409	16	96.50
Dunning, H.	409	17	7.90
Call, C.D.	409	19	12.50
Lively Irrevoc. Real Estate Trust	410	3.1	28.00
Lively Irrevoc. Real Estate Trust	411	1	21.00
Slowinski, M. Et Al	411	3	99.00
Slowinski, J., N., M., & J.	411	4	44.00
Wheeler, L. & L.	413	1	0.57
Coombs, R. & S.	413	2.1	43.40
Loveday, G. & D.	413	3	47.00
Coombs, R. & S.	413	8	108.00
Wheeler, L. & L.	413	13.1	186.50
Sweeney, G.	413	16.1	11.61
Shearer, K. & C.	413	17.1	30.23
Shearer, D.	413	22	7.70
Sweeney, G.	413	30	0.75
Weller, L.	413	32	34.97
Weller, L.	413	33	4.62
Valley Community Land Trust Inc.	413	35.3	4.31
Valley Community Land Trust Inc.	413	49	58.50
Graves, J. & E.	414	3	77.00
Nims, D. & J.	414	13	96.40
Nims, D. & J.	414	15	9.40
Shearer, K. & C.	414	17	24.78
Nims, D. & J.	415	17	54.45
Johnson, B.J.P.	415	24	31.50
Moyer, P.	415	26.2	28.78
Nims, D.	416	2	62.00



OWNER	MAP	LOT	ACRES
Roberts, D.	416	4	7.00
Roberts, D.	416	5	10.50
Cromack, C. & A.	417	15	4.00
Cromack, W. & Menard, D.	417	16	68.50
Cromack, W. & Menard, D.	417	20	19.00
Standish, J.	418	1	62.00
Cromack, C. & A.	418	2	3.20
Potts, B. J.	418	9	9.57
Barber Hill Reat Estate Trust	418	18	45.00
Barber Hill Real Estate Trust	418	19	43.00
Barber Hill Real Estate Trust	418	20.1	35.00
Cromack, W.	418	24	43.00
Cromack, W.	418	25	10.70
Cromack, W.	418	27	16.00
Roberts, D.	419	1	131.00
Barber Hill Real Estate Trust	419	10	3.70
Barber Hill Real Estate Trust	419	11	41.00
Barber Hill Real Estate Trust	419	12	6.20
Williams, V.	420	2	89.00
Galvin, E.	420	8	38.00
Galvin, E.	420	9	39.00
Galvin, E.	420	12	8.60
Eckstein, M. & J. Trustees	420	31	22.00
Eckstein, M. & J. Trustees	420	36	3.70
Galvin, E.	420	47	44.50
Galvin, E.	420	61	5.30
Foster, S.	421	1	33.26
Galvin, E.	421	21	25.00
Foster, S.	421	40.3	75.93
Spring Farm Limited Partnership	422	1	5.77
Graves, J. & J.	422	4	100.00
Spring Farm Limited Partnership	422	19.7	13.66
Wheeler, C.	422	20.11	6.00
Wheeler, C.	422	21.1	75.50
Kasky, A. & F.	422	25	70.00
Schneider, W. & B.	422	27	11.70
Schneider, W. & M.	422	29	26.50
Schneider, W. & M.	422	36	2.80
Schneider, W. & M.	422	38	2.20
Schneider, W. & M.	422	59	11.00
Sessler, L.	422	60	0.10
Schneider, W. & M.	422	61	6.50
Kasky, A. & F.	422	62.1	34.50
Weber, F. & A.	422	63.2	5.00
Weber, F. & A.	422	64.1	21.10

OWNER	MAP	LOT	ACRES
Randall, G. & E.	422	73	7.40
Valley Community Land Trust Inc.	422	82	133.50
TOTAL			5,372.96

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

B.2 Privately Owned Forested Land

Approximately 35 percent of Colrain's open space with some level of protection from development is privately owned forest in one of the Chapter 61 tax abatement programs, accounting for approximately 5,788.4 acres, or 20.8 percent of the town's area. Table 5-4 indicates that only 30.89 acres of privately owned forested land are protected from development in Colrain with two conservation restrictions.

Both the owner and manager of properties with conservation restrictions are the same entity. Their use continues as forested land with private funds used to create the conservation restriction. Properties with conservation restrictions may have the potential for passive recreational use or for activities such as fishing or hunting, but this is dependent upon the wishes of the landowner. It is important to note, however, that public access cannot be assumed, as properties with conservation restrictions are privately owned. Both of the parcels with conservation restrictions noted in Table 5-4 lie within the town's Rural Zoning District.

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

Owner	Holder of the Conservation Restriction	Map	Lot	Acres
Sherburne, P.	Franklin Land Trust	414	16.2	27.79
Bennett	Franklin Land Trust	405	46, 47	3.10
TOTAL				30.89

Source: Town of Colrain Assessor's Records and Maps, 2003; Franklin Land Trust, 2003.

Privately owned forestland with temporary protection is shown in Table 5-5 and Table 5-6. In addition, many of the temporarily protected farms shown in Table 5-3 include farm woodlots. Approximately 49 percent of privately owned forest with temporary protection in Colrain is enrolled in the Chapter 61 tax program for Forestry, while 51 percent is enrolled in the Chapter 61B program for Recreational Open Space. Two of the owners of the Chapter 61 Forestry lands are lumber companies who manage their lands for timber.

All of the parcels in Table 5-5 and Table 5-6 are temporarily protected in the Ch.61 Forestland and the Ch. 61B Recreational Open Space Classification and Taxation Program and the degree of protection of these parcels is short term. There are no public grants awarded as a result of the program, however, the owner agrees not to change the land's use for ten years while paying reduced property taxes during that time period. No state, town or private funds are used to convert a parcel to either Ch. 61 Forestland or Ch. 61B Recreational Open Space. Both the owner and manager of these properties are the same entity. While the majority of the Ch. 61 and Ch. 61B

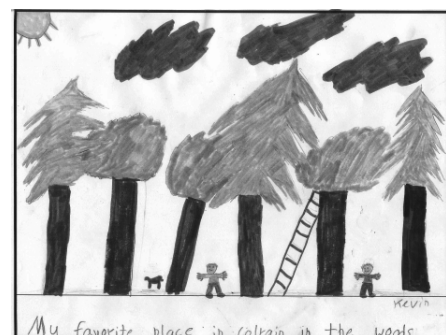


parcels are located in Colrain’s Rural District, a few lie within the Griswoldville and Prolovich Commercial-Industrial Districts, which allow business and professional offices with less than six employees, as well as community uses, agricultural and recreational, and residential uses by right and other commercial and industrial uses by special permit.

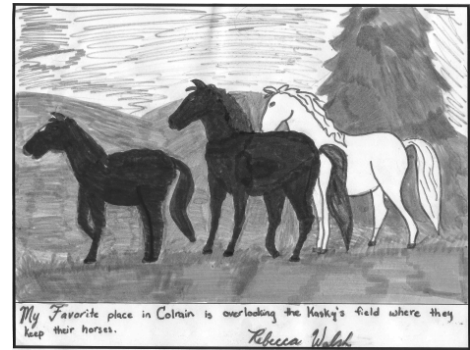
Privately owned forestlands offer many values to the community and are important resources for several reasons. First, many forestlands are large parcels with a low degree of fragmentation, so wildlife and plant habitats are preserved. When these forestlands are protected from development, they help to protect and provide clean water, air, and healthy wildlife populations. Forest soils have a high infiltration capacity, so they absorb moisture and permit very little surface runoff. Once absorbed, water is released gradually so flooding is reduced during large rain events and streamflow is maintained during low water months. Forests recycle nutrients, so the nutrients do not pass into waterways, and water quality is preserved. Because forest soils are absorptive, soil erosion is reduced and fish habitat is preserved. Forestlands also have a thermal impact on brooks. When trees are removed from stream banks, water temperatures rise and cold water-dependent aquatic species like trout are adversely affected. Many forested lands may also provide recreational value such as hunting, fishing, hiking, and bird watching for Colrain residents, if access is allowed by the owner. The Chapter 61 and 61B forested landscapes help to preserve the character of the wooded landscape prized in Colrain.

Table 5-5: Privately Owned Forestlands with Temporary Protection from Development Enrolled in the Ch. 61 Forestland Open Space Taxation Program

Owner	MAP	LOT	ACRES
Silver Birch Farm	103	16	73.60
Hammer, M.	130	4	17.00
Obrien, D.	401	7	18.00
Forrest, N.	401	8	12.10
Commonwealth.Of Mass.	401	15	72.00
Cowls, W.D., Inc.	402	2	93.00
Cowls, W.D., Inc.	403	3	123.00
Cowls, W.D., Inc.	403	4	52.00
Peck Realty Trust	404	12	62.00
Peck Realty Trust	404	14	56.00
Johnson, J. & L.	405	2	39.20
Johnson, J. & L.	405	12	35.50
Greenburger, P.	405	17	49.50
Fisher, L. & L.	405	27	18.92
Fisher, L. & L.	405	28	12.63
Greenburger, P.	405	31	49.00
Cromack, C. & A.	407	1	206.00
Purington, W. & L.	407	13	173.10
Purington, W. & L.	407	14	124.60
Griswold, G.	407	28	51.00
Isles, O. & S.	407	38	1.10
Isles, O. & S.	407	45	28.00



OWNER	MAP	LOT	ACRES
Potts, J.B.	408	18	41.00
Potts, J.B.	408	22.1	139.17
Cowls, W.D., Inc.	409	8	30.00
Cowls, W.D., Inc.	409	9	24.00
Cowls, W.D., Inc.	409	14	105.00
Cowls, W.D., Inc.	409	18	25.70
Cowls, W.D., Inc.	410	1	53.00
Mann, T.S., Lumber Co.	411	7	125.00
Sherburne, P. & J.	414	5.1	83.00
Sherburne, P. & J.	414	5.2	39.86
Sherburne, P. & J.	414	12	0.35
Hammer, M.	416	1	114.00
Cromack, C. & A.	417	19	67.00
Standish, J.	417	23	13.00
Standish, J.	418	1	186.50
Cromack, C. & A.	418	7	70.00
Clough, W.	419	6	89.17
Eckstein, M. & J. Trustees	420	31	65.00
Jordan, R. & G.	421	9	45.09
Jordan, R. & G.	421	34	12.00
Spring, W.J.	422	11	106.25
Logan, N. & K.	422	18	9.13
Logan, N. & K.	422	19.1	33.30
Total			2,843.77



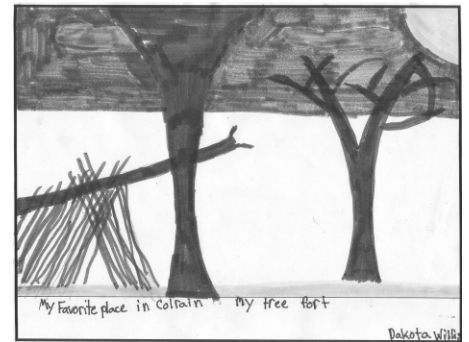
Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

Table 5-6: Privately Owned Forestlands with Temporary Protection from Development Enrolled in the Ch. 61 B Recreational Open Space Taxation Program

Owner	MAP	LOT	ACRES
Stafford, M.	103	8	3.10
Stafford, M.	104	10	1.40
Stafford, M.	104	11	43.50
Stafford, M.	105	11	0.75
Stafford, M.	105	12.1	1.60
Donelson, W. & S.	106	4	58.00
Giard, R.	112	5	85.50
Koscinski, M. & L.	113	1	16.75
Boyd, W. & L.	116	7	5.90
Stamas, E. & E.	118	7	33.50
Shaw, J.	121	14	63.50
Hillman, A.	128	11	40.00
Hillman, P. & J.	128	12	6.50
Brooks, R. & Davis, B.	403	13	43.50

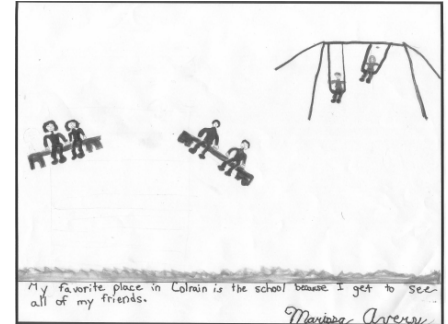


Owner	MAP	LOT	ACRES
Barnes, R. & J.	404	7	18.50
Boyd, W.	404	9	137.00
Truesdell, D.	404	27	46.00
Hillman, A.	405	18	42.00
Johnston, J. & G.	405	37	18.00
Griswold, D. & C.	406	40	40.50
Silva, M. & C.	406	54.2	5.10
Purington, E.	406	54.3	23.40
Purington, E.	406	55	23.50
OWNER	MAP	LOT	ACRES
Hager, S.B., Jr.	407	16	94.00
Hager, S.B., Jr.	407	17	11.30
Dumas, L.	408	4	17.95
Truesdell, C. & D.	408	12	48.00
Truesdell, C. & D.	408	13	140.50
Truesdell, D.	409	7	13.10
Waldron Family Trust	409	12	8.30
Waldron Family Trust	409	13	4.80
Waldron Family Trust	409	15	58.50
Stanley, L. & E.	411	5	40.00
Stafford, M.	412	5	21.00
Beauregard, W. & L.	414	18	88.50
Smith, P. & S.	415	20	18.00
Oneto, S., Trustee	415	22	151.00
Prosser, D. & E.	415	31.1	48.26
NRA Foundation, Trustee	416	3	99.00
Potts, J.B.	417	13	13.84
Dodge, R. & A.	417	26	69.00
NRA Foundation, Trustee	418	14.1	106.00
Johnson, A.H. & L.	418	15.1	67.00
Spencer, G. & S.	418	22	34.50
NRA Foundation, Trustee	418	23	2.00
Spencer, G. & S.	418	28	53.00
Yanischevsky, R. & Tasgal, D.	418	31	3.49
NRA Foundation, Trustee	418	32.1	21.00
Yanischevsky, R. & Tasgal, D.	418	32.2	5.40
Yanischevsky, R. & Tasgal, D.	418	32.3	1.03
St. Clair, S.	418	38	53.50
NRA Foundation, Trustee	418	39	10.20
Sullivan, J.	419	2	133.50
Roberts, R. & S.	419	3	81.00
Bartlett, R., Jr. & J.	419	4	132.00
NRA Foundation, Trustee	419	5	57.00
NRA Foundation, Trustee	419	15	0.50



OWNER	MAP	LOT	ACRES
NRA Foundation, Trustee	419	17	2.10
Barber Hill Real Estate Trust	419	19	10.20
Roberts, R. & S.	420	1	27.50
Cutting, B.	420	3	28.00
NRA Foundation, Trustee	420	4	21.00
NRA Foundation, Trustee	420	5	44.00
NRA Foundation, Trustee	420	6	10.90
NRA Foundation, Trustee	420	75	27.00
Devine, K. & L.	421	11	9.50
NRA Foundation, Trustee	421	18.1	41.00
Devine, K. & L.	421	24	39.00
Devine, K. & L.	421	25	142.00
Gangne, C. & K.S	421	31.2	28.00
Devine, K. & L.	421	46	1.50
Drew, R. & B.	422	33	3.90
Drew, R. & B.	422	34	2.00
Drew, R. & B.	422	51.1	42.00
Drew, R. & B.	422	55.2	1.38
Total			2,944.65

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.



C. PUBLIC AND NON-PROFIT PARCELS

State conservation agencies and the Town of Colrain own a significant portion of Colrain's land. Almost all of this land is permanently protected from development. However, the town-owned parcels have a low level of protection because they are not under the authority of the Colrain Conservation Commission. The following inventories include those parcels that are owned by the Commonwealth of Massachusetts and the town.

C.1 Publicly Owned Open Space

There are approximately 3,230 acres of publicly owned open space in Colrain, accounting for about 20 percent of all open space with some level of protection in Colrain and 11.6 percent of the town's land area. Publicly owned open space includes land owned by state conservation agencies, municipal fire and water districts, school districts, the federal government and the Town of Colrain. These lands are described in Tables 5-7, 5-8, and 5-9. For the purposes of this section, both public and privately owned cemeteries are included in this category. Cemeteries are listed in Table 5-10.

The Massachusetts Department of Conservation and Recreation (DCR) is the largest single property owner in the Town of Colrain. The agency owns 2,243.7 acres in two



large blocks. The largest, the Catamount State Forest, contains 1,310 acres and is located in the southwest sector of town. The H.O. Cook State Forest, with 933.7 acres, is located in the northwest quadrant of Colrain. The Catamount Forest receives use by hikers, bikers, swimmers, picnickers, and snowmobilers. The State Division of Fisheries and Wildlife (DFW) owns approximately 417 acres in Colrain. Most of this land is located adjacent to the Catamount State Forest. DFW also maintains 29.9 acres of land along the Green River.

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

Property Manager	Site name	Map	Lot	Acres	Current Use	Recreation Value	Public Access
DFW	Catamount Wildlife Management Area	401	6, 9	117.50	Wildlife Management Area	High	Gated. One road with car access on the south. All others walking access only.
DCR	Catamount State Forest	402	3	1310.00	State Park	High	Gated. One road with car access on the south. All others walking access only.
DFW	Catamount Wildlife Management Area	402	4, 6	184.14	Wildlife Management Area	High	Lot 4 is on town line with Charlemont and is accessible via DCR land. Lot 6 is accessible via Stacy Rd.
DCR	H.O. Cook State Forest	405	19, 20	112.00	State Park		Good for hunting. Potential for logging problems re: trails. Not Gated Good access
DCR	H.O. Cook State Forest	406	14, 16, 17, 24, 25, 26, 27, 32	821.70	State Park	Good for hunting.	Good access via several roads
DFW	Catamount Wildlife Management Area	412	1	85.00	Wildlife Management Area	High	Access via Stacy Road
DFW	Green River Access Area	421	40.4, 47	29.94	River Access	High	Access via South Green River Road
TOTAL				2,660.3			

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

The Town of Colrain owns approximately 106 acres of undeveloped land with limited protection (*see Table 5-8*). All of these parcels are under the authority of the Select Board and are therefore considered to have limited protection from development. If residents wanted to sell town land for development, the Select Board or a Town Meeting vote could provide the authority. If the land was held by the Conservation Commission,

it would take a majority vote by the Massachusetts State Legislature to convert open space to another non-conservation use.

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

Owner/Property Manager	Site Name/Use/Condition/Access	Map	Lot	Acres
Town of Colrain	Land across from transfer station. Used to be a three-story house. The town bought it to ensure residents would not be affected by potential pollution from the landfill./Now used as storage for town construction materials (fill, rocks)/Good condition for stated purpose though people dump refuse there./ Access is off public way.	101	3	3.10
Town of Colrain	Land across from transfer station / Open space/Could be used as access to the North River.	101	4	0.37
Town of Colrain	Ballpark/Reconditioned open field will be used in future as a ball field/ Needs parking and improved access to make accessible.	125	1.1	9.15
Town of Colrain	Old Mill Site/Vacant built landscape/Unknown condition/Access prohibited.	125	1.21	5.64
Town of Colrain	Tower/Civil Defense Horn Site/Located off of a dirt road up a steep incline/Area opened by way of a timber harvesting operation/Access may need to be more constrained if status as a civil defense structure continues.	125	11	5.61
Town of Colrain	Colrain Elementary School /Playground and Play field spaces/ Mixed condition/ Access is good /For details see ADA Inventory in Appendix B.	127	14	6.50
Town of Colrain	Town Common/This is a triangular piece of land at the intersection of Rte. 112 and Greenfield Rd./Used for town beautification.	127	34	0.07
Town of Colrain	Arthur Streeter Lot	127	43	0.54
Town of Colrain	G. William Pitt House/Forty-two acres of open space in back of Historical Society's structure in center with access off of Main Rd.	127	55	42.00
Town of Colrain	Catamount Cave/Recreational site/Good condition/Public access via North Catamount Hill Rd.	403	2	2.76
Town of Colrain	Wooded land on Green River/Taken for back taxes/Open Space and Boy Scout Camp/ Inaccessible from Colrain except by way of the Green River.	418	42	30.00
Total				105.74

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

It is not unusual for a community to set aside land for future expansion of schools, sports fields, police and fire stations, and drinking water supplies. Open space planned for these purposes might be used as open space today and placed under the authority of the Select Board. It may also be sensible to place town-owned land that clearly contains wetlands or wildlife habitat, but which does not provide for easy development, under the authority and protection of the Conservation Commission.

The town-owned land on Charlemont Road across from the transfer station entrance (Map 101, Lot 3) borders on Meadow Brook and the North River. It is a gently sloping



lot, which has been used for a some time as a storage site for till and construction material. There are trails and a woods road on this parcel. It is well-maintained with the exception of some debris along its frontage. Currently, its recreational value is low, but it has good potential for maintained walking trails. Paved access for parking could be made available off Charlemont Road, which would provide access to the parcel as well as the North River.

The town owns a smaller parcel (Map 101, Lot 4) adjacent to the one noted above. It is woodland, which also borders on both Meadow Brook and the North River. The parcel is in good condition. While its current recreational value is low, it has high potential for access to the North River. Potentially, parking could be made available off Charlemont Road at the parcel noted above.

There are two town-owned parcels on Foundry Village Road. The first parcel (Map 125, Lot 1.1) with frontage on the North River is a wooded site with a field currently being groomed for a ballpark. It is in good condition and has access via a gravel road. The other parcel (Map 125, Lot 1.21) is across the North River. It is a former mill site with cement foundations remaining. This level parcel is surrounded by fencing.

The Colrain Elementary School (Map 127, Lot 14) is a modern building with adjacent playground, basketball court, baseball diamond, miscellaneous sports field and picnic tables. The playground, with modern equipment, is in good condition. The basketball court is a full court made of asphalt with two baskets and is also in good condition. The remaining area, which includes the baseball diamond, picnic tables and park benches scattered on the site, are in fair condition. The baseball diamond has team fences and benches, and a small amount of stadium seating. There are three picnic tables on the site, none of which are handicapped accessible. The park benches have backs and armrests. A parking lot is located at the front and side of the school building. Recreational access is via a gated cement walkway at the front of the school as well as an unofficial access via a dirt road adjacent to the side parking lot. The official access is not fully handicapped accessible nor are the grounds themselves.

The Shelburne Falls Fire District, Colrain Fire District and the Griswoldville Water District together own approximately 444 acres of open space with limited protection. These lands are used for water supply protection and distribution. These lands provide public benefits to residents in addition to sustaining clean drinking water supplies. Forest provides wildlife habitat, limited passive recreation opportunities, and scenery (*see Table 5-9*).

Table 5-9: Water and Fire District Land with Limited Protection from Development in Colrain

Owner/Property Manager	Map	Lot	Acres
Shelburne Falls Fire District	104	8	7.7
Shelburne Falls Fire District	104	9	7.08
Shelburne Falls Fire District	104	13	0.06
Shelburne Falls Fire District	412	7	96
Shelburne Falls Fire District	412	8	20
Shelburne Falls Fire District	412	9	64
Shelburne Falls Fire District	412	10	15
Shelburne Falls Fire District	413	5	100
Shelburne Falls Fire District	413	6	1.2
Colrain Fire District	127	44	0.33
Colrain Fire District	128	3	11.80
Griswoldville Water District	412	3	14.30
Shelburne Falls Fire District	412	10	15.00
Colrain Fire District	414	28	59.00
Colrain Fire District	415	1	18.00
Colrain Fire District	415	2	14.70
Total			444.17

Source: Town of Colrain Assessor's Records and Maps, 2003; MassGIS Open Space data, 2003.

Table 5-10 lists the cemeteries in Colrain, which are owned by the town and by private associations, which are protected from development. Most cemeteries represent well-maintained open space areas that are sometimes appropriate for walking and bird watching.

Table 5-10: Parcels of Land Protected from Development in Colrain

Owner/Property Manager	Site Name	Map	Lot	Acres
Christian Hill Cemetery	Christian Hill Cemetery	405	24	0.61
East Colrain Cemetery	East Colrain Cemetery	414	22	2.60
Colrain Cemetery Assoc.	West Branch Cemetery	110	8	8.9
Colrain Cemetery Assoc.	North River Cemetery	130	1, 2, 3.2, 3.12,	6.34
Chandler Hill Cemetery	Chandler Hill Cemetery	415	18	2.00
TOTAL				20.45

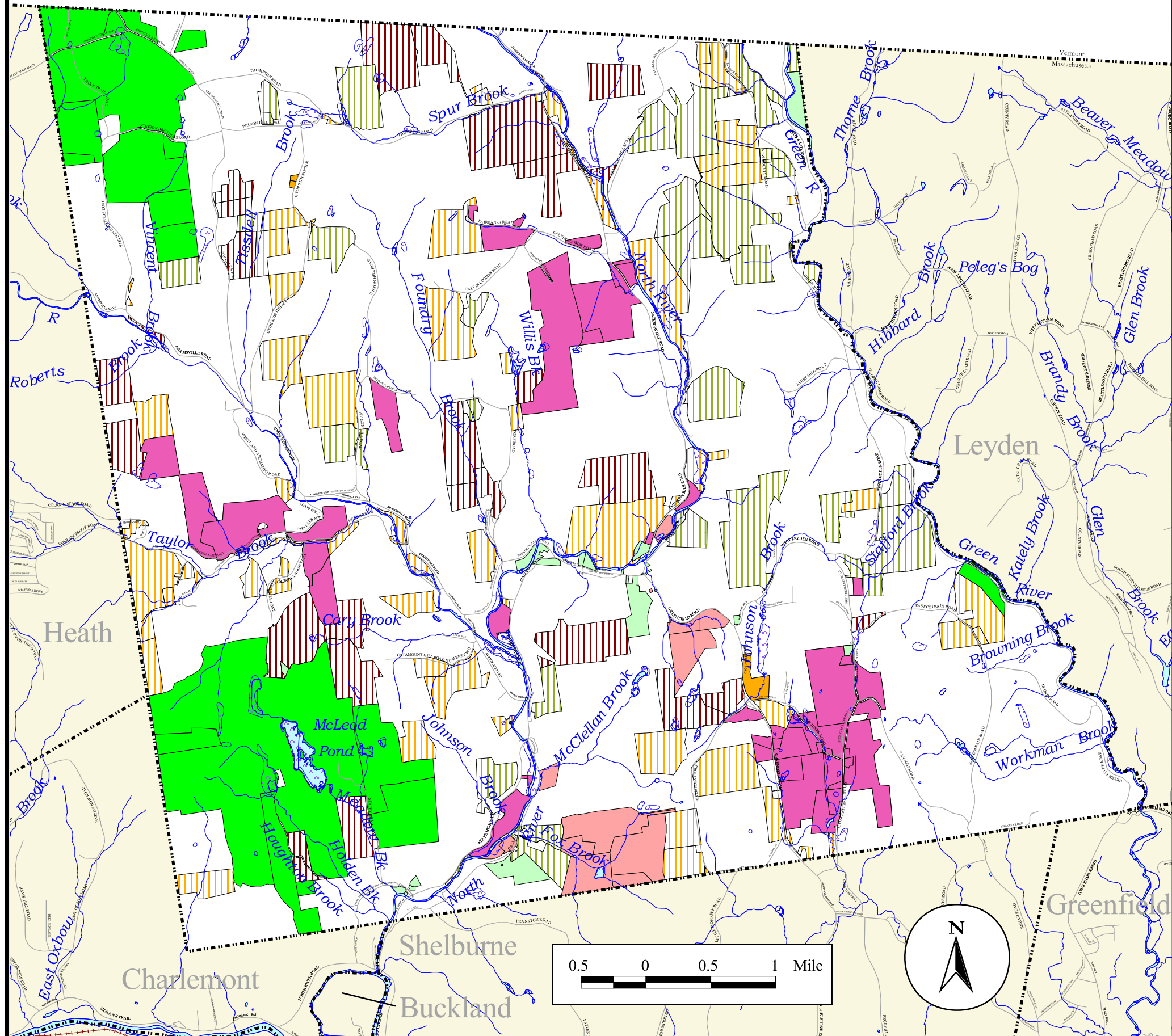
Source: Town of Colrain Assessor's Records and Maps, 2003;



Town of Colrain

Open Space and Recreation Plan

Protected Open Space



Legend

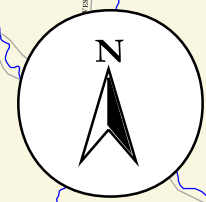
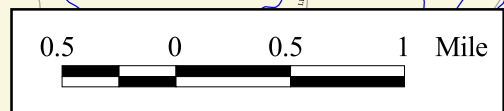
- Town Line
 - Rail Lines
 - Roads
 - Streams and Rivers
 - Water
 - National Wetlands Inventory wetland
-
- #### Open Space
- Land Protected from Development
 - Agricultural Preservation Restriction
 - Conservation Restriction
 - Commonwealth of Massachusetts (DCR and DFW)
 - Land with Limited Protection from Development
 - Town Owned Land
 - Fire and Water Districts
 - Land Temporarily Protected from Development
 - Chapter 61: Forestry
 - Chapter 61A: Agriculture
 - Chapter 61B: Recreation

Map Sources:

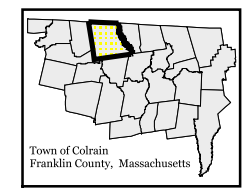
Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs 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, pond, stream, National Wetlands Inventory, open space (Chapter 61 & Protected Open Space) data provided by 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.

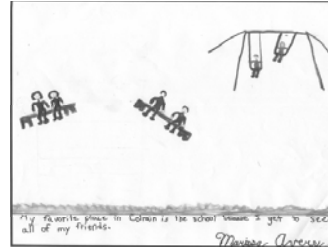


FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS
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SECTION 6

COMMUNITY GOALS



A. DESCRIPTION OF PROCESS

The Town of Colrain's open space and recreation goals were developed through the following planning process:

- In September of 2002, open space and recreation surveys were mailed to 842 households in Colrain. Of these, 184 were returned and counted as responses, which represents a 22 percent rate of return. (See Appendix A for a copy of the survey). Although the responses may not reflect the opinions of all residents, they do represent a significant source of community input, which was used to develop the preliminary draft Section 8-Goals and Objectives.
- From September 2002 to February 2003, Franklin Regional Council of Governments Planning Department staff developed this Open Space and Recreation Plan under the supervision of the Open Space Planning Committee. The planning process used several methods for involving public participation:
 - The results of the 2002 Open Space and Recreation Survey were used as the basis for the development of goals and objectives as well as the overall open space and recreation vision.
 - Ten public meetings were held by the Open Space Planning Committee.
 - Several drafts of each section of the plan were mailed to approximately eighty-five people representing key town boards, community groups, and residents.
 - Elementary School students were encouraged to draw pictures of their favorite places in Colrain. These will be used to adorn the cover and pages of the Plan.
 - A public forum was held on March 13, 2004, where residents reviewed and discussed the major findings and five-year action plan. All public comments were recorded and considered for incorporation into the plan.

B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS

Colrain residents appreciate the town's historic villages, rural character, and expansive scenery. They value Colrain's diverse landscapes, which include a mix of working farms, extensive forests, steep hillsides and river floodplain corridors that provide many scenic views. 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 responded to the Open Space and Recreation Survey and participated in the process of developing this plan have a vision for the future of Colrain's natural, historical, and recreational resources. In this ideal world, the town's large blocks of forests and active farmland will be protected as a result of cooperative efforts between private landowners, and local and state agencies and private non-profit organizations. These lands will remain in private hands and control, and continue to contribute property taxes. The town's rivers and streams will be clean enough for fishing and swimming. Residents will continue to enjoy clean drinking water from sources and aquifers that have been protected from contamination.

In an ideal Colrain, there will be a diverse local economy, anchored by existing manufacturing and agricultural operations, including a form of heritage-based eco-tourism that takes advantage of tourist traffic between Rte. 2 and Vermont. Residents will speak proudly of their successful efforts to maintain and restore historic buildings in each of the villages. Town officials will have measured the cost and benefits of increasing levels of tourism and may, as a result, focus their efforts on increasing local farmers' farm-based revenue streams. A result of supporting local agricultural and forestry businesses, will be access to fresh vegetables, dairy products, fruit and meat produced close to home, as well as the opportunity to buy forest products raised by their neighbors. Promoting these agricultural enterprises helps farms stay viable and maintains open space.

Residents of all ages and abilities will enjoy a system of well-maintained trails, most of which will be on private property. Town officials and trail enthusiasts will have been successful at organizing and facilitating trail use among residents to only those trails open to the public with the express permission of the landowners. Landowners that were interested in providing access might be offered incentives for providing public access to their land. In the same way, pedestrian and bicycle trails will be developed to connect villages to each other as well as to conservation areas and state forests. Trails, riverfront parks and watercraft put-ins will provide public access to the North and Green Rivers. In addition, the town will have been successful at attracting state and federal grants towards the development of recreational programs for both youth and adults that support residents' understanding, respect and appreciation of, and for, their heritage and the natural world.



SECTION

7



ANALYSIS OF NEEDS

The Colrain 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 subsection A, Summary of Natural Resource Protection Needs, the most important environmental issues are highlighted. In subsection B, Summary of Community's Needs, the recreation and open space needs of the residents are discussed. Finally, in subsection C, Management Needs, the obstacles to the effective resolution of these needs are addressed.

A. SUMMARY OF NATURAL RESOURCE PROTECTION NEEDS

Colrain residents value their town's natural environment, clean drinking water and air, expansive forests, diverse wildlife habitats, farmland, and long-range scenic views. They appreciate all of the ways their town still feels rural and want to keep it that way. According to the 2002 Open Space Survey, at least 90 percent of survey respondents stated that it was important to conserve clean drinking water, clean air, lakes, streams, and ponds, forests, scenic views, wilderness and wildlife habitat, open fields, and farmland. The main environmental issues include non-point source pollution, erosion, unplanned development, the loss of farmland, the need for protecting large blocks of forest, and access to the North and Green Rivers.

Generally speaking, people need to become more aware of how their actions may negatively impact water quality of rivers, streams, ponds, and groundwater. Non-point source pollution happens when organic and inorganic pollutants enter soil or water from other than a single point, like a pipe. One example of potential non-point source pollution generation is home construction on an unprotected slope because rain may wash topsoil into abutting wetlands. Other examples where non-point source pollution can threaten valued resources include, spreading manure on frozen ground, especially near streams where no vegetative buffer exists; improper disposal of household hazardous materials including motor oil; road salt use near a private or public well; and stream bank erosion caused by the removal of vegetation.

Unplanned development, which can increase the amount of stormwater runoff (another form of non-point source pollution), is a way of describing what can occur in a community that has minimal zoning, land use regulation, or protected land. With unplanned development, houses appear on building lots easiest to develop. Most

residential development in this situation would likely be a combination of approval-not-required lots and traditional, “cookie-cutter” subdivisions. Unplanned development can increase the threat, over time, to large blocks of forest habitat, aquifers, and clean and plentiful drinking water by fragmentation, exploitation, and non-point source pollution.

The challenge for many rural towns in the Commonwealth is to grow in population without diminishing natural resources like clean drinking water and contiguous forests beyond the capacity of local ecosystems. Although exact capacity thresholds for water supplies and forest habitat acreage are not yet known, most Colrain residents would probably agree that poorly planned development can detract from their town’s rural character and erode the quality of the environment over time.

Of course, some types of residential, commercial, and industrial development can be very beneficial to a community especially if it is consistent with a town plan that balances growth with natural resource protection. Well-planned economic development, for example, could help provide jobs for low and moderate-income households. According to housing research by RKG Associates conducted as part of Colrain’s Community Development Plan, the biggest housing need in town is among low and moderate income households that already own their homes. Housing is considered affordable when a household spends 30 percent or less of gross income on housing costs. The data shows that there are low and moderate-income households in Colrain that spend more than 30 percent on their housing costs. These residents are homeowners not renters. This implies that the town does not need to create new units for low and moderate-income households. Instead, the town should work to increase the wealth of its residents so that existing housing costs would become a smaller percentage of householders’ larger gross incomes. The 2002 Survey results agree with this finding by identifying the three most significant threats to Colrain’s sense of community and rural character as being lack of job opportunities, loss of agricultural land, and rising property taxes.

Interestingly, these threats are all related. For example, if job opportunities increased in the next decade through traditional industrial and commercial development, the town could see an increase in population beyond the MISER projection of 10 percent (see page 3-8). While fewer people would be moving away to seek employment outside the county, others might move in to enjoy a high quality of life. Generally, as more families move in to Colrain, a greater level of municipal services would be required to serve the population, including schools and road infrastructure. Based on regional trends, the average residential tax bill will likely rise as the population of Colrain increases because services costs are greater than the revenues generated by residential property. In addition, residential development would likely reduce the number of acres in agricultural uses over time since farmland often represents the most developable soils.

Clearly, not all development is undesirable, nor could the town over-control land development, even if this was the consensus of residents and officials. Most Colrain residents understand the need for balance and respect the rights of property owners, including their right to develop land. Ideally, through zoning and non-zoning techniques the town could provide incentives to developers so that all development in Colrain would



contribute as much as possible to the residents' shared vision for their town. For example, by using existing mill sites for new industrial development, forest or farmland would remain undeveloped. Another way the town could promote and preserve active farmland, help stabilize local residential property tax bills, and create jobs, is by developing a heritage-based eco-tourism sector in the town and the region, which could combine residents' interest in historic preservation, bicycle and hiking trail systems, active farmland, and home-based information businesses. This could help to increase revenue from farms' direct sales and create local jobs. A town with a greater number of its residents working locally feels different than a bedroom community. Local workers can support stores and other services with their purchases.

One of the most important natural resource needs is for a continuing discussion on how residents want their town to develop over time, and which areas should be protected from development so that water, forests, habitat, and farmland can be conserved for the next year, and the next 100 years.

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 Colrain residents. Although the Colrain 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.

The 2002 Open Space and Recreation Survey, and discussions at Open Space Committee meetings, helped to identify several potential community needs relating to open space and recreation resources: additional recreational programming for all ages; safe pedestrian and bicycle paths between village centers and areas of interest; maintenance and development of recreational facilities in Colrain, including new swimming areas and a skating pond; the support of existing Library programming; programs in the schools promoting awareness of local ecology and history; more community events; and public access to the North River.

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 may already organize and lead limited recreational events or programs. Some towns have active Recreation Committees that are responsible for running a set number of events per year. When the economy is stronger, Colrain officials might consider working with other towns like Leyden and Heath to hire a part time recreation coordinator. This person could coordinate the efforts of volunteers,

attract state and federal grants to develop and maintain recreational facilities, and organize and produce recreational and community-wide events for residents year round.

Trails and access to rivers are two other needs expressed by residents in the 2002 Open Space and Recreation Survey. Residents voiced a desire to have pedestrian and bicycle trails connecting some of the villages in Colrain. Road right-of-way bike lanes and paths might be more easily designed and implemented than a system of trails, which go between roads and across private land. Either way, permanent trail systems are 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.

Access to the North River for swimming, fishing, boating, and other recreational activities, is also identified as a need in the plan. One town property that might be potentially developed for access to the North River is the most northern part of the nine-acre lot, which is being developed for a ball field (Assessors Map 125/Lot 1.1).

C. MANAGEMENT NEEDS

Colrain has several management needs with respect to open space and recreation, all of which are dependent in part on a prioritization of the most important problems and the best solutions. As is mentioned in the Natural Resources Needs section, the most important management need for local officials and community leaders may very well be the importance of building consensus on a vision for the future of land use, development and conservation in town. This process has been initiated in earlier open space and recreation planning, through the recent zoning revisions, and continues with this open space and recreation planning process, and the Community Development Planning process. Consensus is needed to determine the land that should be protected and the land that should be developed. Without consensus, the town will be less equipped to protect its existing resources (water supplies, farmland, and large blocks of forest habitats), its rural character, as well as to develop future recreational facilities (trail networks).

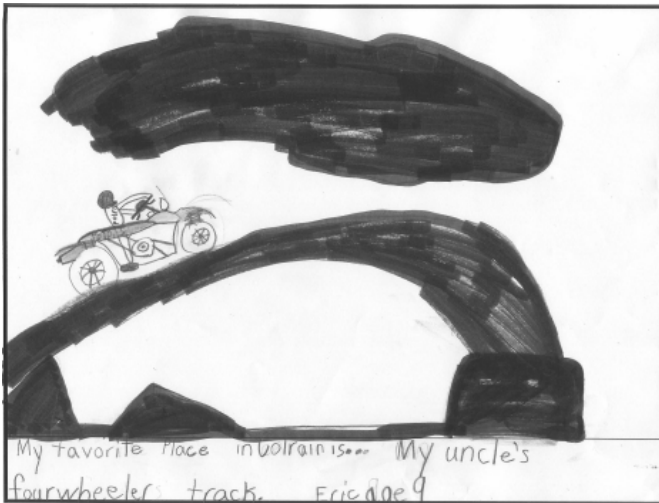
The Town of Colrain would be well served by working closely with the three water supply districts in town to help develop strategies to protect against groundwater contamination. Contaminants can originate from non-point source pollution generators like improper pesticide use by farmers, homeowners, utility companies, and highway departments; and road salt use by local and state highway departments. None of these districts have long-term emergency water supplies, so the loss of one well to pollution could be extremely inconvenient to residents using public water. Zoning can be designed to include overlay districts that seek to protect aquifer integrity by restricting the amounts and types of hazardous materials that can be stored, used and disposed of, and the density and types of development allowed. This level of protection cannot happen without the collaboration of town and district officials.



Although farmland is at risk throughout New England, as markets and other forces often work against small family farms, there are a multitude of strategies available to a town committed to preserving its local and regional agricultural industry. Local volunteer leadership must continue to work with regional land conservation and farm promotion efforts. However, to be truly effective, the town may need to continue to ensure that its policies are friendly to farm and forest-based businesses. In addition, farmers may need to be consulted in advance if the town is considering the development of strategies or zoning which might affect their bottom line.

To protect large blocks of forest from fragmentation might require both land protection efforts and strategies similar to those that would support agriculture. Overall, 58 percent of the privately owned forestland in Colrain is owned by non-residents. Land protection work may begin with providing landowners (residents and non-residents) with information about the benefits and risks of enrolling in the Chapter 61 programs, in protecting their land with a conservation restriction, and with estate planning in general.

To develop a town-wide trail system that takes advantage of historical roads and Native American trade routes, Colrain officials might begin by organizing a well-represented trails committee. The purpose of the committee would be to develop a coordinated plan for trail development, maintenance, and 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. As part of this effort, trails committee members could meet with Department of Conservation and Recreation (DCR) officials to discuss access issues on both the Cook and the Catamount State Forests.





SECTION 8

GOALS AND OBJECTIVES

The following Goals and Objectives were formulated from the results of the Colrain Open Space and Recreation Planning Survey, which was conducted in September of 2002. Overall, 842 surveys were mailed households in town. Of these, 184 were returned and counted as responses. The survey responses represent a 22 percent rate of return. Although the responses may not reflect the opinions of all residents, they do represent a significant source of community input, which was used to identify the open space and recreation resources most important to Colrain residents. It is expected that additions and deletions will be made to the goals and objectives through discussions of the Open Space Planning Committee.

Goal: Ensure that Colrain sustains its small town rural environment characterized by general peace and quiet, clean air and water, safety from crime and vandalism, affordable housing, and an abundance of recreational opportunities including access to forests, fields and unbroken trails.

Objectives:

- Encourage economic development in appropriate areas.
- Encourage a discussion amongst all Town Boards, Commissions, and residents on the costs of municipal services associated with different land uses including commercial, industrial, and residential development and farm and forestland.
- Continue to work with the Franklin Regional Housing and Redevelopment Authority to determine the feasibility of developing affordable senior housing within walking distance of Colrain Center.
- Utilize Colrain's natural beauty and historic rural charm and develop strategies for encouraging eco-tourism and heritage-based tourism.
- Support local tourism by preserving and restoring historical buildings and other structures or places of historical significance.

Goal: Ensure that the Town of Colrain maintains or improves the quality of its drinking water, air, lakes, streams, and ponds, farms and forestlands, scenic views, wilderness areas and other wildlife habitats, wetlands, stonewalls and historic landscapes, and the diversity and integrity of native plants and animals through the conservation of locally important natural and open space resources.

Objectives:

- Promote the Massachusetts Chapter 61, 61A, and 61 B Land Classification and Taxation Programs to local landowners to help keep undeveloped lands in active farming, forestry, and recreational uses.
- Continue to set aside municipal funding each year to be used as a town match to continue to protect local farmland through the Agricultural Preservation Restriction (APR) Program.
- 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.
- Protect from development lands that contain productive farmland, groundwater resources, large blocks of contiguous forestland, wildlife habitat, and lands that expand public access to the North and Green Rivers.
- Encourage the investment of state, municipal, and private dollars for the purposes of land protection and recreational facilities in Colrain while maintaining property on the tax rolls.
- Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the town in the future.

Goal: Ensure that the Town of Colrain maintains and improves in a cost-effective manner, the quality and accessibility of all of its recreational facilities and programming.

Objectives:

- Develop additional recreational programming for children, adults, and seniors.
- Facilitate discussions with trail users, including the Colrain Sno-Drifters, towards developing a plan to coordinate trail development, maintenance, and promotion for activities such as hiking, horseback riding, snowmobiling, jogging, skiing, and nature/bird watching throughout town.



- Develop a working relationship with the state agency personnel who oversee the management of Catamount and Cook State Forests to address town concerns relating to their access and use.
- Explore cost-effective methods for developing a safe network of walking and bike paths, a new swimming area, and a skating pond.
- Sustain the existing level of programming offered by the Library.
- Continue to encourage educational programs in the schools that promote ecological awareness, preservation of natural resources, historical awareness, and historic preservation.



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 action steps outlined below with input from the public.

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 number of the action as identified on the Action Plan Map at the back of this section, 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, Board of Health, Historical Commission, Fire and Water Districts, Town Administrator, 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 Open Space and Recreation Plan

OBJECTIVE	ACTION	MAP #	RESPONSIBLE BOARD /GROUP	START DATE
Encourage economic development in appropriate areas.	Appoint an Economic Development Committee to identify appropriate areas for development and to put brownfields back to work.	1	Select Board	2005
Encourage a discussion amongst all Town Boards, Commissions, and residents on the costs of municipal services associated with different land uses.	Initiate an All-Board Meeting to discuss costs in services of different land uses.	2	Select Board	2004
Continue to work with the Franklin Regional Housing and Redevelopment Authority (FRHRA) to determine the feasibility of developing affordable housing in appropriate locations.	Research grants to fund an affordable housing feasibility study by the FRHRA.	3	Select Board	2005
Utilize Colrain’s natural beauty and historic rural charm and develop strategies for encouraging eco-tourism and heritage-based tourism.	Form an Events Committee to plan and produce eco-and heritage-based tourism events.	4	Town Administrator	2004
Support local tourism by preserving and restoring historical buildings and other structures or places of historical significance.	Continue to hold public meetings for the purpose of discussing historical Colrain Center and other historic places, landscapes and landmarks.	5	Historical Commission	2004
Promote the Massachusetts Chapter 61, 61A, and 61 B Land Classification and Taxation Programs to local landowners to help keep undeveloped lands in active farming, forestry, and recreational uses.	Write a series of articles in West County News on the benefits to the town and to landowners of land stewardship programs including Chapter 61, 61 A, 61 B and others.	6	Deerfield River Watershed State Forester	2004



OBJECTIVE	ACTION	MAP #	RESPONSIBLE BOARD /GROUP	START DATE
	Develop, promote, and run a short series of informational talks at the library with speakers from land trusts, University of Massachusetts Extension, State Service Forestry Departments, etc.	7	Open Space Committee	2005
	Produce a working woodlot open house/tour of properties in the Chapter 61 program to demonstrate benefits of forestry.	8	Open Space Committee / Forest Stewards Guild	2006
	Work with State Representatives and Legislators to ensure that the Ch. 61, 61 A, 61 B, APR, and land protection programs continue to be funded by the state.	9	Open Space Committee/Select Board/Franklin Regional Council of Governments Regional Planning Board	Ongoing
Continue to set aside municipal funding each year to be used as a town match to continue to protect local farmland through the Agricultural Preservation Restriction (APR) Program.	Establish a monitoring system for collecting stumpage fees and cross-referencing Chapter 132 Forest Cutting Plans.	10	Select Board	2004
	Lobby State Representatives and Legislators to allocate 30 percent of state forest stumpage fees to the town containing the trees.	11	Select Board/Open Space Committee/Franklin Regional Council of Governments	2005
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.	Increase the involvement of local farmers in town events.	12	Events Committee and Community Involved in Sustaining Agriculture (CISA)	2004
	Research how to decrease taxes paid by working farmers on farm buildings.	13	Select Board/Economic Development Committee	2005

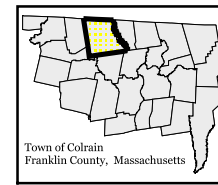
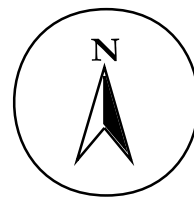
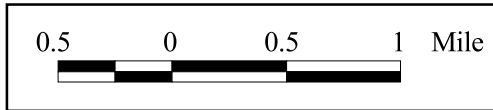
OBJECTIVE	ACTION	MAP NUMB ER	RESPONSIBLE BOARD/GROU P	START DATE
Protect from development lands that contain productive farmland, groundwater resources, large blocks of contiguous forestland, wildlife habitat, and lands that expand public access to the North and Green Rivers	Appoint an Open Space Committee.	14	Select Board	2004
	Identify target areas for protection from development.	15	Open Space Committee	2004
	Discuss land conservation goals with landowners.	16	Open Space Committee	2005
	Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the Town in the future.	17	Conservation Commission	2005
	Identify and secure sources of funding to protect open space in town.	18	Open Space Committee	Ongoing
Encourage the investment of state, municipal, and private dollars for the purposes of purchasing conservation restrictions (development rights) on privately owned open space so that the land remains under private ownership and continues to contribute real estate property taxes.	Produce a promotional campaign that focuses on sustaining residents' quality of life through protected public access to natural areas via the use of conservation restrictions.	19	Open Space Committee	2005
	Promote the value of conservation restrictions within the context of estate planning.	20	Open Space Committee	2005
Develop additional recreational programming for children, adults, and seniors.	Encourage the Recreation Committee to increase their efforts to develop additional programs and facilities.	21	Recreation Committee	2005



OBJECTIVE	ACTION	MAP NUMBER	RESPONSIBLE BOARD/GROUP	START DATE
Facilitate discussions with trail users towards developing a plan to coordinate trail development, maintenance, and promotion.	Host a meeting for area trail users to discuss trail issues in Colrain.	22	Recreation Committee, Colrain Sno Drifters, local horseback trail groups, Deerfield River Watershed Association (DRWA), and Open Space Committee	2005
	Investigate the use of Self-Help funds to pay for trail easements.	23	Recreation Committee and Open Space Committee	2004
Develop a working relationship with the state agency personnel who oversee the management of Catamount and Cook State Forests to address town concerns relating to their access and use.	Participate in the State's Western Connecticut River Valley State Forest Planning Process.	24	Select Board	2004
Explore cost-effective methods for developing a safe network of walking and bike paths, a new swimming area, and a skating pond	Determine which roadways and areas are appropriate for establishing bicycle/walking paths, a swimming area, and a skating pond.	25	Recreation Committee	2006
	Acquire funding to develop new recreational facilities.	26	Recreation Committee	2006
Continue to encourage educational programs in the schools that promote ecological awareness, preservation of natural resources, historical awareness, and historic preservation.	Continue offering natural and cultural resource programs to children in the Elementary School, in the Library, and in the Boy Scouts.	27	Historical Commission/Elementary School/Library	Ongoing
	Acknowledge AmeriCorps for the educational work they have already accomplished with seasonal funding.	28	Select Board/School Principal	2004

Source: Colrain Open Space and Recreation Planning Committee Members; 2004.

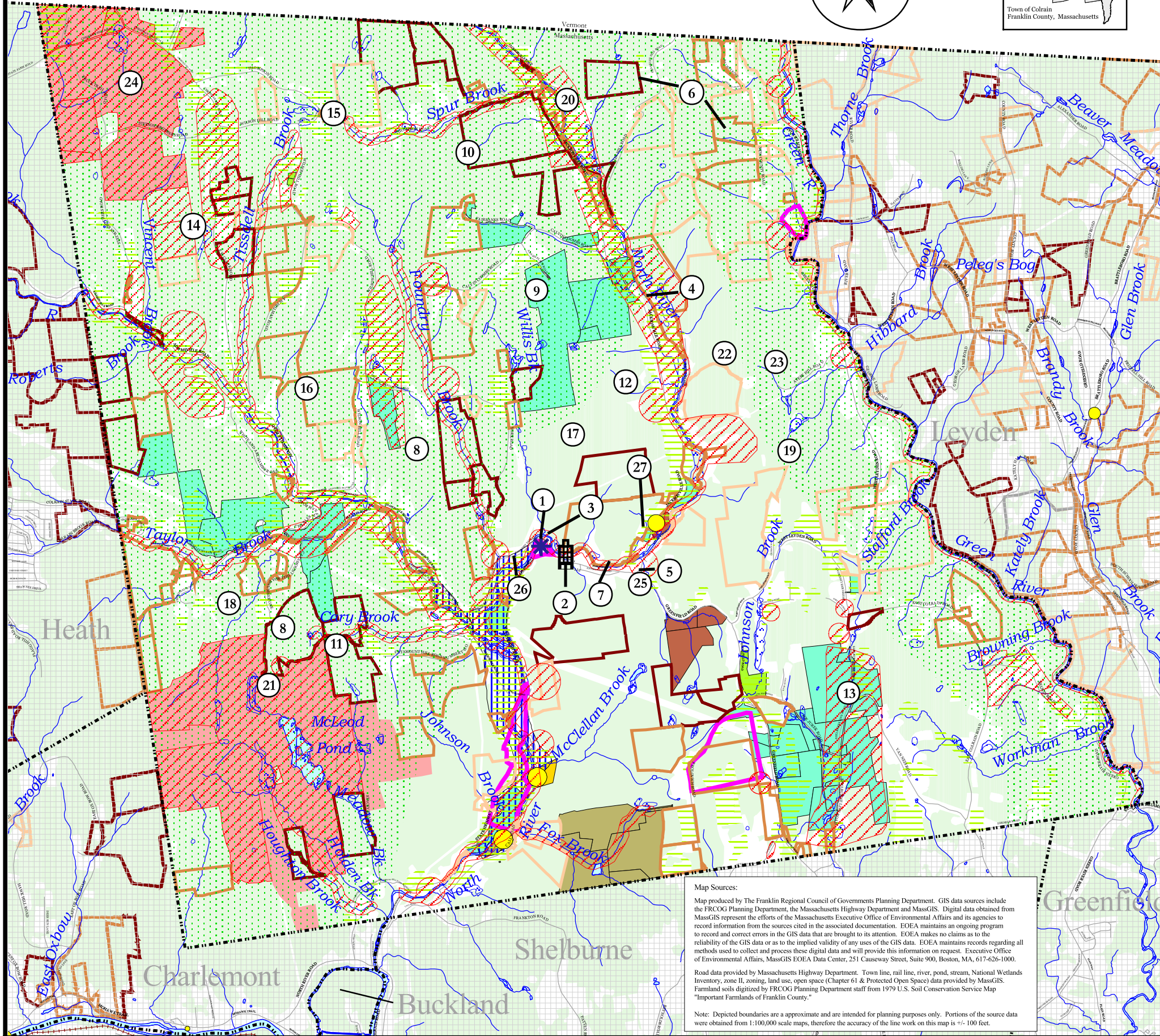




Town of Colrain

Open Space and Recreation Plan

Action Plan



ACTION	MAP #	ACTION	MAP #
Appoint an Economic Development Committee to identify appropriate areas for development and to put brownfields back to work.	1	Identify target areas for protection from development.	15
Initiate an All-Board Meeting to discuss costs in services of different land uses.	2	Discuss land conservation goals with landowners.	16
Research grants to fund an affordable housing feasibility study by the FRHRA.	3	Determine whether the Conservation Commission has the capacity to manage and police conservation lands that could be donated to the Town in the future.	17
Form an Events Committee to plan and produce eco- and heritage-based tourism events.	4	Identify and secure sources of funding to protect open space in town.	18
Continue to hold public meetings for the purpose of discussing historical Colrain Center and other historic places, landscapes and landmarks.	5	Produce a promotional campaign that focuses on sustaining residents' quality of life through protected public access to natural areas via the use of conservation restrictions.	19
Write a series of articles in West County News on the benefits to the town and to landowners of land stewardship programs including Chapter 61, 61 A, 61 B and others.	6	Promote the value of conservation restrictions within the context of estate planning.	20
Develop, promote, and run a short series of informational talks at the library with speakers from land trusts, University of Massachusetts Extension, State Service Forestry Departments, etc.	7	Encourage the Recreation Committee to increase their efforts to develop additional programs and facilities.	21
Produce a working woodlot open house/tour of properties in the Chapter 61 program to demonstrate benefits of forestry.	8	Host a meeting for area trail users to discuss trail issues in Colrain.	22
Work with State Representatives and Legislators to ensure that the Ch. 61, 61 A, 61 B, APR, and land protection programs continue to be funded by the state.	9	Investigate the use of Self-Help funds to pay for trail easements.	23
Establish a monitoring system for collecting stumpage fees and cross-referencing Chapter 132 Forest Cutting Plans.	10	Participate in the State's Western Connecticut River Valley State Forest Planning Process.	24
Lobby State Representatives and Legislators to allocate 30 percent of state forest stumpage fees to the town containing the trees.	11	Determine which roadways and areas are appropriate for establishing bicycle/walking paths, a swimming area, and a skating pond.	25
Increase the involvement of local farmers in town events.	12	Acquire funding to develop new recreational facilities.	26
Research how to decrease taxes paid by working farmers on farm buildings.	13	Continue offering natural and cultural resource programs to children in the Elementary School, in the Library, and in the Boy Scouts.	27
Appoint an Open Space Committee.	14		

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. EOEIA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEIA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEIA 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 EOEIA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.
 Road data provided by Massachusetts Highway Department. Town line, rail line, river, pond, stream, National Wetlands Inventory, zone II, zoning, land use, open space (Chapter 61 & Protected Open Space) data provided by MassGIS. Farmland soils digitized by FRCOG Planning Department staff from 1979 U.S. Soil Conservation Service Map "Important Farmlands of Franklin County."
 Note: Depicted boundaries are an 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.

Legend

- Town Line
- Rail Lines
- Roads
- Streams and Rivers
- Water
- National Wetlands Inventory
- Zone II
- Historic Scenic Landscapes
- Contiguous forest blocks
- Industrial Zoning
- Prime farmland and active agriculture
- Agricultural Preservation Restriction
- Conservation Restriction
- Greenway
- Town hall

- Zone I
- Brown field

Land Protected from Development

- H. O. Cook and Catamount State Forests

Land Temporarily Protected from Development

- Chapter 61: Forestry
- Chapter 61A: Agriculture
- Chapter 61B: Recreation
- Chapter 61 & 61A: Forestry & Agriculture
- Chapter 61A & 61B: Agriculture & Recreation

Limited Protection

- Colrain Fire District
- Griswoldville Water District
- Shelburne Falls Fire District

June 26, 2004

SECTION 10

PUBLIC COMMENT

Public feedback was sought throughout the entire open space and recreation planning process. The text and maps included in the Plan reflect these enhancements. A more direct request for feedback on the Five-Year Action Plan was made at the public forum held March 13, 2004, which resulted in changes to the final drafts of the Five-Year Action Plan.

Copies of the final version of the Colrain Open Space and Recreation Plan were also sent to the following boards and organizations for review and comment:

- Massachusetts Division of Conservation Services (DCS)
- Colrain Board of Selectmen
- Colrain Planning Board
- Colrain Conservation Commission
- Franklin Land Trust

Letters of comment are inserted into the plan at the end of this section. The letters reflect a broad base of support for the research, analysis, outreach and recommendations developed by the Open Space Planning Committee.



SECTION 11

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My favorite place in Colrain is my land.

Morgan