

TOWN OF MONTAGUE

2017 OPEN SPACE AND RECREATION PLAN



Prepared by the
**MONTAGUE PLANNING AND CONSERVATION DEPARTMENT AND
MONTAGUE CONSERVATION COMMISSION**
with assistance from the
FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS

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Table of Contents

Section 1 – Plan Summary.....	1-1
Section 2 - Introduction.....	2-1
A. Statement of Purpose.....	2-3
B. Planning Process and Public Participation.....	2-3
Section 3 – Community Setting.....	3-1
A. Regional Context.....	3-1
B. History of the Community.....	3-7
C. Population Characteristics.....	3-9
D. Growth and Development.....	3-28
Section 4 – Environmental Inventory and Analysis.....	4-1
A. Topography, Geology, and Soils	4-2
B. Landscape Character.....	4-10
C. Water Resources.....	4-10
D. Vegetation.....	4-37
E. Fisheries and Wildlife.....	4-47
F. Favorite Places: Scenic Resources and Unique Environments.....	4-55
G. Environmental Challenges.....	4-59
Section 5 - Inventory of Lands of Conservation and Recreation Interest.....	5-1
A. Privately Owned Open Space.....	5-7
B. Publicly Owned Open Space	5-26
C. Park and Open Space Equity.....	5-36
Section 6 – Community Vision.....	6-1
A. Description of Process.....	6-1
B. Statement of Open Space and Recreational Goals.....	6-2
Section 7- Analysis of Needs.....	7-1
A. Summary of Natural Resource Protection Needs.....	7-1
B. Summary of Community’s Needs.....	7-6
C. Management Needs.....	7-11

Section 8 – Goals and Objectives.....	8-1
Section 9 – Seven – Year Action Plan.....	9-1
Section 10 – Public Comment.....	10-1
Section 11 – References.....	11-1
Appendix A – Youth Favorite Places; 2016 Open Space and Recreation Survey and Results.....	A-1
Appendix B – ADA Self Evaluation Report.....	B-1
Appendix C – Meeting Notices and Minutes.....	C-1
Appendix D – Montague BioMap2 Town Report.....	D-1

SECTION 1: PLAN SUMMARY



SECTION 1

PLAN SUMMARY

The 2017 Montague Open Space and Recreation Plan is a comprehensive inventory of the Town's natural, agricultural and recreational resources and a plan for their stewardship and protection. It contains an analysis of the Town's needs and goals and objectives designed to guide important decisions about the use, conservation and development of the town's land and resources. A Seven-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:

- Large blocks of contiguous forest
- Prime farmland and working agricultural businesses
- Abundant supplies of high-quality ground and surface waters
- Three major rivers, other perennial and intermittent streams and wetlands
- The Montague Plains, with its unusual flora and fauna
- Public parks, playgrounds and recreational programs
- Recreational trail systems that connect residents to the town's natural resources
- Scenic and historic landscapes

These resources provide residents with clean air and water, jobs, and abundant and varied recreational opportunities. Montague'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.

The Seven-Year Action Plan, developed from the results of the 2016 Open Space and Recreation Survey and discussions at nine public meetings and a public forum, identifies goals and objectives for the Town to focus on over the next seven years. The Montague Open Space and Recreation goals are:

- A. Promote and protect our rivers and waterways for improved habitat and recreation opportunities
- B. Provide access to high quality parks in each village

- C. Develop a comprehensive trail network for walking and cycling that connects the villages to open space
- D. Preserve farming as a way of life in Montague
- E. Preserve our pristine drinking water resources, habitat corridors, and special places
- F. Green our villages
- G. Get organized for Open Space and Recreation

Montague is fortunate in comparison to many towns in Massachusetts, in that thousands of acres of land with important natural resources have been permanently protected from development, and that private property owners continue to maintain their land as farms and forest and practice good stewardship. Montague has parks and recreational assets utilized heavily by residents and that also serve as regional attractions. This plan update identifies these existing assets as well as needs and gaps. By identifying and prioritizing lands for protection and recreation improvements, the Town is in a better position to act when opportunities arise, and to be strategic in allocating town resources. Achieving the goals of this plan will require a concerted, cooperative effort on behalf of landowners, elected officials, municipal boards and committees and resident volunteers.

SECTION 2: INTRODUCTION



SECTION 2

INTRODUCTION

Montague has a strong legacy of planning for open space and recreation. Montague has been a community of five vibrant and dense villages separated by generous corridors of open space and working landscapes. The Town's motto is "five fingers on one hand," a reference to the symbiotic relationship of the five villages, and it rings true today. Time after time, the community as a whole has risen to the occasion to plan for and protect the ample and abundant natural resources in the community. This community has mobilized to prevent a nuclear power plant, a regional landfill, and more recently a natural gas pipeline, while working proactively to protect thousands of acres of open space and farmland and developing first class recreational amenities like Unity Park, the Canalside Rail Trail, and Unity Skatepark. The opportunities that lie ahead are identified throughout the plan. This 2017 plan culminates months of effort by many town residents, volunteers, and officials. The plan builds off of decades of good planning and sets a clear strategy for improving our legacy of rich natural resources and a high quality of life for all people in Montague.

Montague's first Open Space and Recreation Plan was prepared in 1987. Since that time, the Town's population increased slightly, and has aged as the Baby Boomer generation gets older. High poverty rates persist within Turners Falls and Millers Falls. Several major manufacturing facilities closed, while others have opened in the town's Airport Industrial Park and on Turnpike Road. Reinvestment and revitalization in Turners Falls and Millers Falls has resulted in historic preservation, affordable housing, cultural facilities, and new restaurants and businesses. Most recently, years of efforts to promote and support the creative economy in Turners Falls have been recognized by a Cultural District designation by the state.

Major improvements have been made to Town parks, including a bandstand at Peskeomskut Park for outdoor concerts, the transformation of Unity Park into a town and regional asset, and the construction of the Unity Skate Park that helps meet a long-standing community need. An abandoned railroad line along the power canal has become the Canalside Trail Bike Path, the most used recreational resource in town.

Climate change and an increase in severe storms has raised awareness and concern about flood damage and erosion. The hydro-electric facilities on the Connecticut River in Montague are undergoing relicensing, and the new license will determine how the facilities will impact fish

habitat, riverbank erosion, recreational access to the river, and redevelopment of the buildings and land between the river and power canal, for the next 30-50 years.

New housing development in rural areas of town has been slow. While there has been scattered development of homes on large lots on Dry Hill and Chestnut Hill, the vast majority of Montague east of Route 63 remains forested and undeveloped. More than 1,500 acres of the Montague Plains and hundreds of acres of farmland and forestland have been permanently protected from development. There are over twenty working farms in town. Montague's five villages retain their distinct character. Residents continue to benefit from an abundance of high quality public drinking water supplies. Water quality in the Connecticut and Millers Rivers is improving. Wildlife is abundant in rural areas of town, and publicly-owned lands offer exceptional opportunities for outdoor recreation. Montague residents still enjoy the great wealth of agricultural, natural, scenic and recreational resources catalogued in the Town's first Open Space and Recreation Plan.

While housing development has been slow, low housing vacancy rates suggest a high demand for housing in the region following the Great Recession. The scenic beauty of Montague's rural landscape is probably a significant draw for new residents. Farms continue to struggle to operate viable businesses, however, farmland protection and the growth of "buy local" campaigns have helped support local agriculture. Fiscal constraints threaten the Town's ability to provide recreational programs and facilities for its residents. The Town recognizes the need to prioritize and balance open space protection with well-planned development in order to support a stable tax base.



Photo credit: Linda Hickman

A. STATEMENT OF PURPOSE

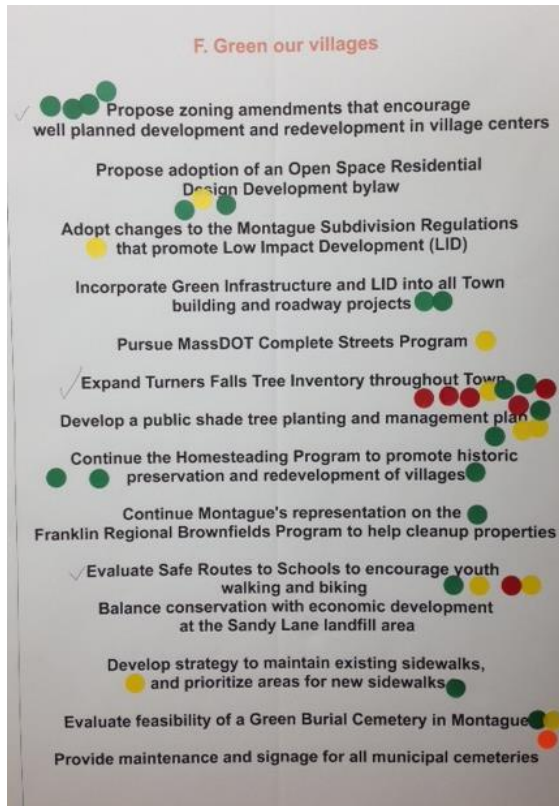
This Open Space and Recreation Plan is intended to map and document the extent and quality of Montague's natural, agricultural and recreational resources and establish their importance from local and regional perspectives. Its recommendations are designed to protect these resources for future generations.

This plan is not intended as a comprehensive strategy for land use in the Town of Montague. Rather, it is designed to supplement the Town's other planning documents, including the Comprehensive Plan, Housing Plan, Turners Falls Livability Plan, Multi-Hazard Mitigation Plan, and other plans developed for specific purposes. It is important to note that while this document focuses on the need for protection of land and natural resources, it is critically important that the Town continue to prepare and implement strategies for residential, commercial and industrial development. Identifying appropriate areas for development and promoting policies to create new housing and business growth in these areas will help remove pressure to develop land that is valuable for agriculture, forestry, conservation and recreation.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

Development of the 2017 Montague Open Space and Recreation Plan update was a collaborative effort between the Montague Planning and Conservation Department, Conservation Commission, Parks and Recreation Department, and the Franklin Regional Council of Governments. Participants in the update process are listed at the beginning of the plan.

The original Open Space and Recreation Plan was developed through a public process involving many committee meetings, a community survey, multiple public meetings, and a public forum. The process for the 2017 update included a new community survey on the Town's open space and recreation needs, as well as nine committee meetings where drafts of chapters were reviewed and revised. The survey was available online via a link on the Town website, and as a hard copy at the Town Hall, the public libraries in Turners Falls, Millers Falls, and Montague Center, and at the Senior Center in Turners Falls. A press release was published in the Montague Reporter and the survey link was emailed to various Town email lists.

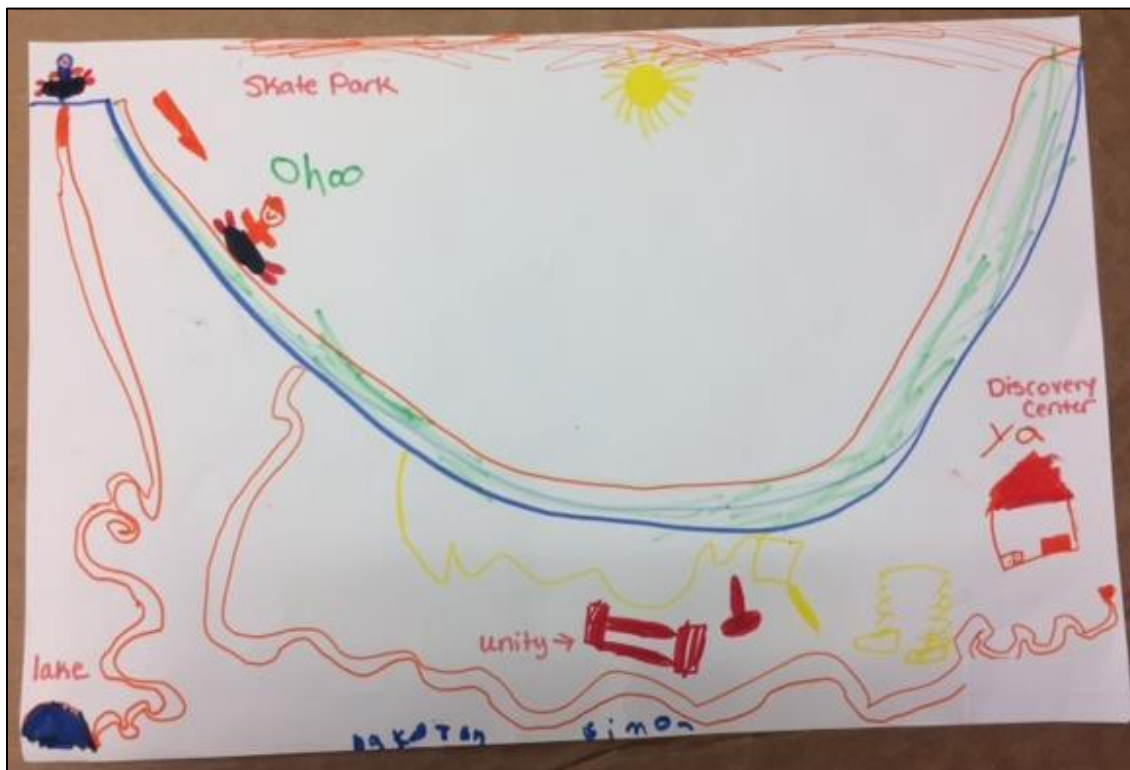


The plan update was spearheaded by the Montague Town Planner and the Conservation Commission, who reviewed and commented on the draft sections at nine Conservation Commission meetings between September 2016 and June 2017. A public forum of the draft plan was held on May 31, 2017 at the Town Hall. The forum was advertised in the local newspaper and on the Montague town website, where a draft version of the plan was made available prior to the forum. Fliers were placed at the Town libraries and emailed via Town email lists. Participants at the forum were encouraged to choose priority action items by placing stickers on posters listing the draft goals and actions. The posters were set up in Town Hall for a week after the forum to allow residents who did not come to the forum a chance to participate in the prioritization. Goals and action

items were revised based on input from committee members and the public, and a seven-year action plan was drafted. The forum was also filmed by Montague Community Television and available for viewing online.

Outreach to the environmental justice areas of Turners Falls and Millers Falls included publicizing the survey and forum in multiple locations within both villages. The forum was held in Turners Falls at a location within walking distance of many residents and accessible by public transit.

SECTION 3: COMMUNITY SETTING



SECTION 3

“The very lay of the land early made of us a community” (Pressey, 1910)

COMMUNITY SETTING

The Town of Montague contains both rural and urban landscapes that have been established, developed and affected by its human inhabitants over the past several hundred years. Planning for open space and recreation in Montague must account for the relationships between people and the built environments, open spaces and natural resources upon which they depend. Encouraging development and redevelopment that carefully considers impacts on natural systems and access to recreation and open space, will improve the quality of life for current and future generations.

A. REGIONAL CONTEXT

The Town of Montague is located in western Massachusetts, in central Franklin County. Montague is bordered by the Millers River and the towns of Gill and Erving on the north and northeast, Wendell on the east, and the towns of Leverett and Sunderland to the south. The Connecticut River and the towns of Deerfield and Greenfield form Montague’s western boundary.

In 2013, *Sustainable Franklin County: Franklin County’s Regional Plan for Sustainable Development* (RPSD) was completed.¹ The RPSD is a long-term guide for Franklin County municipal governments, regional organizations, businesses, non-profits, and individuals. According to the plan, the predominant residential development patterns in the county are converting farms and forests to residential lots, and fragmenting the remaining farmland and forestland. The Approval Not Required (ANR) provision of the Subdivision Control Law allows for residential development along existing roads without Planning Board approval when frontage and access requirements are met. Combined with large lot zoning in many towns, which can require anywhere from one to four acres of land per home, the result is continual residential development spaced along town roadways, away from town centers. New subdivisions, while

¹ <http://frcog.org/wp-content/uploads/2014/06/Sustainable-Franklin-County-2013-Plan.pdf>

less common than ANR development, are also often located outside of existing town centers, further fragmenting the land and converting green spaces to development.

The plan identifies proposed priority development areas and emerging development areas in the county where the majority of future development ideally would be located, reversing the current development trends. Downtown Turners Falls was one of five priority development areas identified, and Millers Falls was one of four emerging development areas identified, where infill development and redevelopment should be encouraged, including a mix of residential, commercial, and light industrial uses. Impacts from climate change, particularly a projected increase in flooding, may create challenges to infill and redevelopment in areas along rivers and in floodplains. Additionally, the age of water and sewer infrastructure poses a challenge to increased development in some of the priority areas. In Montague, challenges also include the difficulty of recouping the costs of redevelopment with current rental and lease rates, and the need for expanded transit options.

A.1 Natural Resources Context

Montague falls into two ecoregions. The western section of town is part of the Connecticut River Valley, which is distinguished from its surrounding uplands by milder climate, relatively rich floodplain soils, and level terrain with some higher outcropping ridges. The remainder of Montague falls within the Worcester-Monadnock Plateau, which includes the hilliest areas of central Massachusetts. The higher elevations and geology in this region result in generally cool and acidic soils and vegetation typical of northern New England.²

Montague contains significant forest and water resources that support a broad range of wildlife and plant species, including the Connecticut, Millers, and Sawmill River corridors, the Montague Plains (the largest inland Pitch Pine-Scrub Oak community in the State), an area between Greenfield Road and Turners Falls Road, most of the forested area east of Route 63, and an area south of Montague Center along the border of Sunderland and Leverett. More information about Montague's wildlife and plant habitat is contained in Section 4: Environmental Inventory and Analysis.

Significant blocks of forest in Montague and surrounding communities are permanently protected from development (see Section 5: Inventory of Lands of Conservation and Recreation Interest for more details about protected land in Montague). Blocks of permanently protected

² *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Montague town report. 2012. http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Montague.pdf

and contiguous forest in eastern Montague abut equally significant tracts of protected forest in Wendell to the east and Mount Toby State Forest to the south in Sunderland. In addition to land owned and protected by the Commonwealth of Massachusetts, thousands of acres of forest in Montague are privately owned and managed for forestry, wildlife and open space. As a result of the Mormon Hollow Landscape Partnership, there is now an east-west corridor of permanently protected land from the Connecticut River in Montague Center to the Wendell State Forest, and a north-south corridor of protected land from the Leverett town line to the Millers River. These open spaces in Montague contribute to a larger corridor of protected land extending from the Connecticut River in Montague to the Quabbin Reservoir.



Montague's forests are part of a regional forested landscape that stretches from the Quabbin Watershed in the east, west to the Connecticut River and north into New Hampshire. Both the North Quabbin Watershed and the Connecticut River Greenway have statewide and regional importance. A significant portion of the land area in the Quabbin Watershed is comprised of vast tracts of permanently protected forest, and the Connecticut

River Greenway is a very important riparian habitat and a vital recreational resource.

Contiguous protected forest in Montague is part of the connection of open space across the regional landscape. The importance of Montague's forested land will be addressed in greater depth in Section 4.

The major watersheds in Montague are the Connecticut River and the Millers River. The Millers River watershed is located in north central Massachusetts and southwestern New Hampshire, and includes the northeast section of Montague. This watershed is bordered on the east by the Nashua River watershed, on the west by the Connecticut River watershed, and on the south by the Chicopee River watershed. From its origin in New Hampshire, the Millers River flows south, then gradually west into the Connecticut River. The Millers River drains a regional landscape that is 392 square miles in size, 320 of which are in Massachusetts. Industry, dense residential development and the use of the river for wastewater disposal all produced serious pollution in the past. Many of the point sources of pollution (i.e., discharges that can be traced to a single point) have been regulated over the last several decades. As a result, the Millers River is much cleaner today than in the past, although some serious problems remain. The

Millers River Watershed Council (MRWC) is a regional organization working to improve water quality in the watershed.

The Connecticut River Watershed is the largest river ecosystem in New England. It travels from its headwaters at Fourth Connecticut Lake at the Canadian border through four New England states: Vermont, New Hampshire, Massachusetts, and Connecticut, encompassing approximately 11,000 square miles. The river enters Massachusetts through the Town of Northfield and drains all or part of forty-five municipalities before entering the State of Connecticut, where it eventually empties into Long Island Sound at Old Saybrook. As a result of the Federal Clean Water Act and the investment of more than \$600 million in wastewater treatment, most of the Connecticut River is classified as swimmable and fishable (Class B) and in some areas drinkable (Class A), though the actual water quality in the river does not always meet these classifications. The Connecticut River Watershed Council, based in Greenfield, is a regional organization working to promote the environmental well-being of the watershed. Water quality in the Millers and Connecticut Rivers will be discussed at greater length in Section 4.

The mainstem of the Connecticut River and some of its tributaries are used for the production of electricity. The Federal Energy Regulatory Commission (FERC) regulates hydropower facilities in the Connecticut River watershed, and issues licenses to hydropower operators that typically range from 30 to 50 years. In exchange for damming rivers to produce power, hydropower operators must provide public benefits, such as recreational facilities, fish passage facilities, and adhering to operating practices that reduce damage to habitat and water quality. Licenses for five hydroelectric facilities on the Connecticut River are due to expire in April 2018, including the Turners Falls Dam and the Northfield Mountain Pumped Storage Facility in Massachusetts, owned by FirstLight Power. The relicensing process presents an opportunity to Montague and the region to improve recreational access along the Connecticut River and to reduce negative impacts associated with the operation of the hydropower facilities such as riverbank erosion and impacts to migratory fish.

A. 2. Recreation Resources Context

A number of Montague's recreational resources serve town residents and visitors from neighboring communities. The Canalside Trail Bike Path is the longest off-road section of the Franklin County Bikeway, and travels from Unity Park along the power canal in Turners Falls through Montague City to a repurposed railroad bridge that crosses the Connecticut River into Deerfield. On-road bicycling and mountain biking are also popular in Montague. The refurbished playground and the new skate park at Unity Park in downtown Turners Falls are

destinations for families and teenagers from Montague and nearby towns. Montague's natural resources provide hiking, fishing, hunting, horseback riding, birdwatching, and boating opportunities. The Poplar Street Boat Launch provides access to the Connecticut River, and is the downstream portage site for the Turners Falls Dam. Barton's Cove located in Montague and Gill is a popular boating and camping destination on the Connecticut River, however, there is no boating access from the Montague side of the river. Montague's recreation resources will be described in more detail in Section 5: Inventory of Lands of Conservation and Recreation Interest.



The Canalside Trail Bike Path is part of the Franklin County Bikeway and is the region's longest off-road multi-use path.

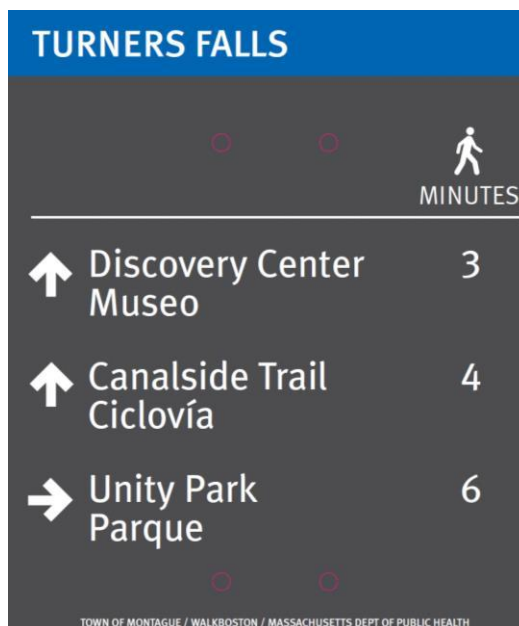
A.3 Socio-Economic Context

Montague is a regional employment center for surrounding towns. Water power, manufacturing and proximity to Interstate 91 and Route 2 all have had an influence on the development and growth of the Town of Montague and the region. Like many communities along the major waterways in the region, Montague has experienced economic decline since its manufacturing heyday. As will be described in the next section, Montague's manufacturing centers developed due to the availability of water power from the Connecticut River and the presence of a vast forest resource. Then the railroad came to Montague, spurring further industrial growth in four of the five villages. Manufacturing declined across the region during the latter half of the 20th Century.

The Town of Montague experienced slow population growth in the 1990s, and a slight decrease in population between 2000 and 2010. Montague has lower household incomes and a higher rate of residents living in poverty than Franklin County and the State (see Table 3-3). Turners Falls in particular has a high concentration of residents, approximately 25.9%, living below the poverty level. Poverty is known to create barriers to access to health services, quality education, healthy food, housing, and other basic needs and opportunities, and to contribute to poor health status generally. According to the Massachusetts Department of Public Health (DPH), in 2014 the Gill-Montague Regional School District had one of the highest percentages (36%) of students

considered overweight or obese in Franklin County.³ Montague also has one of the highest rates of obesity among adults compared to other communities in the state, according to the DPH.⁴

The built environment plays a role in residents' access to physical activity and overall health. In 2014 Franklin County ranked the lowest in the percentage of residents with access to exercise opportunities out of all Massachusetts counties. Only 72% of Franklin County residents have access to exercise opportunities (defined as the percentage of individuals in a county who live reasonably close to a location for physical activity such as parks or recreational facilities) compared to 94% for the state.⁵ Residents who live closer to parks, sidewalks, bike paths, gyms, and other recreation facilities have more opportunities to exercise.



Example of the pedestrian wayfinding signs installed in downtown Turners Falls in 2016.

Franklin County is among 52 cities and towns throughout the State that are part of the Mass in Motion (MIM) Municipal Wellness and Leadership Program. This program supports towns with initiatives that improve access to healthy food and physical activity, as well as addressing chronic disease prevention. In 2016, Montague was chosen as the recipient of a MIM grant to work with WalkBoston to create and install pedestrian wayfinding signs in Turners Falls. The signs provide approximate walking times to downtown destinations in both English and Spanish.

New housing development in Montague has slowed significantly since the early 2000s. However, Montague currently has a low homeowner vacancy rate (0.9 according to 2014 American Community Survey estimates), signifying a demand for new housing. As the economy improves, new housing development may begin to increase. This is a good time to anticipate what that growth might look like and how the town can accommodate new

³ MA Department of Public Health, "Results from the Body Mass Index Screening in Massachusetts Public School Districts, 2014." <http://www.mass.gov/eohhs/docs/dph/com-health/school/status-childhood-obesity-2014.pdf>.

⁴ MA Department of Public Health.

⁵ *County Health Rankings and Roadmaps*. A Robert Wood Johnson Foundation program. <http://www.countyhealthrankings.org/app/massachusetts/2016/measure/factors/132/map>. Accessed August 30, 2016.

development in the form of healthy, livable neighborhoods and accessible recreation areas, while at the same time protecting significant natural resources.

B. HISTORY OF THE COMMUNITY

Given the excellent fishing opportunities offered by the Connecticut and Millers Rivers as well as the hunting resources of the Montague Plains and surrounding woodlands, it is believed the Town of Montague was the site of extensive Native American settlements. Until the late 17th century, large numbers of Native American people congregated at the falls on the Connecticut River, at the place then known as Peskeomskut, and at Millers Falls during the annual spring spawning runs of salmon and shad. The present-day village of Turners Falls derives its name from a massacre on the site that occurred on May 19, 1676. Captain William Turner, accompanied by approximately 150 men, descended upon an Indian encampment at the site of the falls. Between two and three hundred men, women and children were slaughtered as they slept or drowned in the river while trying to escape. It is believed that few Native Americans lived in Montague after this time (Pressey, 1910).

Europeans came to Montague in the early 18th century and settled in the area around Taylor Hill and Dry Hill in Montague Center, the oldest of the Town's five villages. These Colonial settlers farmed the excellent soils of the surrounding river lowlands. Lumbering was also a part of the economic base, with use of the Sawmill River as a means to power the mills. Approximately a dozen buildings survive from this period, most notably the Root Tavern on Old Sunderland Road, built in 1739. At the time of the American Revolution, there were 575 residents of Montague.

Around the turn of the century, with the construction of the Upper Locks and Canal in Turners Falls by Dutch capitalists, as well as improvements in roadways and bridges such as the Fifth Massachusetts Turnpike from Montague City to Millers Falls and the Connecticut River Bridge, the Town of Montague began to expand beyond the village of Montague Center to Montague City and Millers Falls. Population increased steadily in the early 19th century, doubling to 1,152 by 1830.

The railroad came to the Town of Montague in the 1850s. Millers Falls was the hub of both east-west and north-south routes. In 1865, John Alvah Crocker purchased the Upper Locks and Canal Co. and began the creation of Turners Falls as a planned industrial community. He built the power canal and dam on the Connecticut River and marketed both industrial and home

sites in the village. Avenue A was laid out as a wide commercial street flanked by narrower streets designed to accommodate housing for mill workers.

Almost all of the architecturally significant buildings in Turners Falls date from the late 19th Century, including the Keith Paper Mill (1871), Colle Opera House (1874), Crocker Bank Building (1880), Esleek Manufacturing (1895), and several churches. Industry also came to both Montague City and Millers Falls during this period. Development of Lake Pleasant as a spiritualist camp can also be attributed to the coming of the railroad.

Steady growth continued into the early 20th century, with the population of the Town reaching 7,925 in 1915. The Turners Falls Company began generating hydroelectric power in 1904 and went on to construct the Cabot Station hydroelectric plant in 1915, which is still in operation today. In 1936, the Town acquired and expanded the existing private airport on 185 acres on the north section of the Montague Plains, making it the largest airport in the state at the time (*Turners Falls Observer*, January 19, 1962).

With the decline of industry in the latter half of the 20th century came the increase of residential/suburban growth, particularly in the villages of Turners Falls, Montague City, Montague Center and Millers Falls. Industrial development in the 1990s was concentrated within Airport Industrial Park located between Turners and Millers Falls.

The past twenty-five years of history in Montague reflect the national trend of increasing public concern about the environment. In the 1970s, there were proposals to locate first a large-scale landfill, then a nuclear power facility on the 2,000-acre Montague Plains. The proposals were met with strong local opposition and eventually were withdrawn.

Revitalization efforts in Turners Falls began in the 1980s, with restoration of the streetscape and planning for the development of the Great Falls Discovery Center. Montague Center residents successfully advocated for protection of approximately 50 acres along the Sawmill River off North Street during the 1980s, and the town's farmers have been active participants in the state's Agricultural Preservation Restriction Program. Farming and forestry are still widely practiced in Montague, and the rivers that once provided power for industry continue to play an important economic function through recreational activities and tourism.

C. POPULATION CHARACTERISTICS

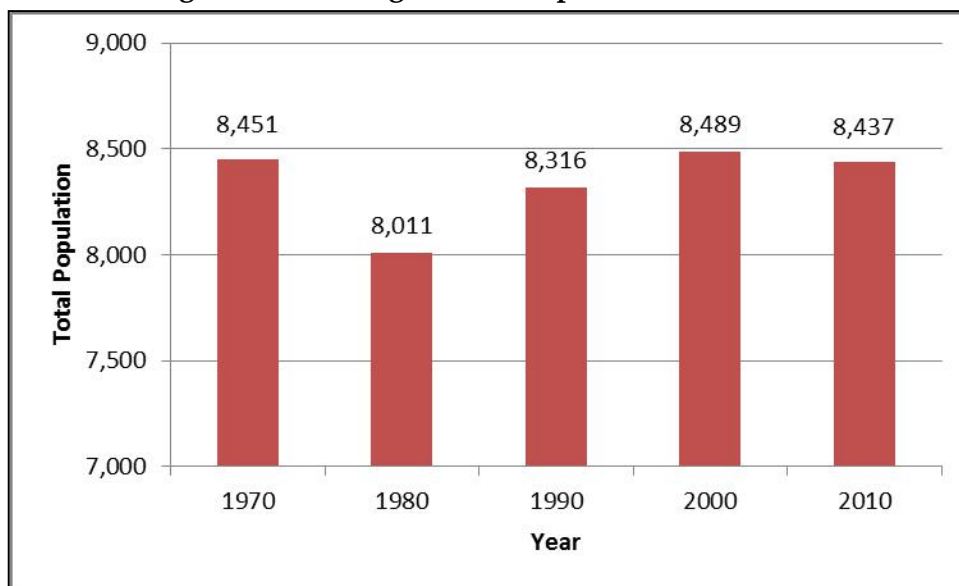
In this section, Montague's needs for open space and recreational resources are assessed based upon an analysis of demographic and employment statistics. The demographic information includes changes in total population, changes in the age composition of Montague's population and potential changes in development patterns due to shifts in the local economy.

C.1 Demographic Information

C.1.1 Population and Population Change

Demographics are useful for forecasting the need for open space and recreational resources. Currently Montague has a population density of 269 people per square mile.⁶ According to the U.S. Census, during the ten-year period 1970-1980, the Town of Montague saw a decrease in population of 440 residents or 5.2 percent of its total population. This decline in population was consistent with a decline in manufacturing in the town and county. Over the next two decades, 1980-2000, the number of Montague residents increased 5.7 percent, for a net gain of 17 residents between 1970 and 2000 (See Figure 3-1). During the 1980s, several buildings in downtown Turners Falls were rehabilitated into public housing units, restoring much of the population loss from the previous decade. From 2000 to 2010, Montague's population declined slightly by 52 residents, or 0.6%.

Figure 3-1: Montague Total Population, 1970 – 2010



Source: U.S. Census Bureau, 1970, 1980, 1990, 2000, and 2010 Decennial Census.

⁶ Population density was calculated using U.S. Census 2010 Decennial Population divided by total square miles, which was derived from 2005 MassGIS Land Use data.

Over the forty-year period, Montague's population grew at a slower rate than Franklin County and Massachusetts, which saw population increases of 20% and 15% respectively (Table 3-1). However, between 2000 and 2010, Franklin County had a slight decline in population, similar to Montague, and Massachusetts' population grew by only 3%. The surrounding towns of Deerfield, Erving, Gill, and Leverett all experienced population increase between 2000 and 2010, while Greenfield, Sunderland, and Wendell declined in population over this time period.

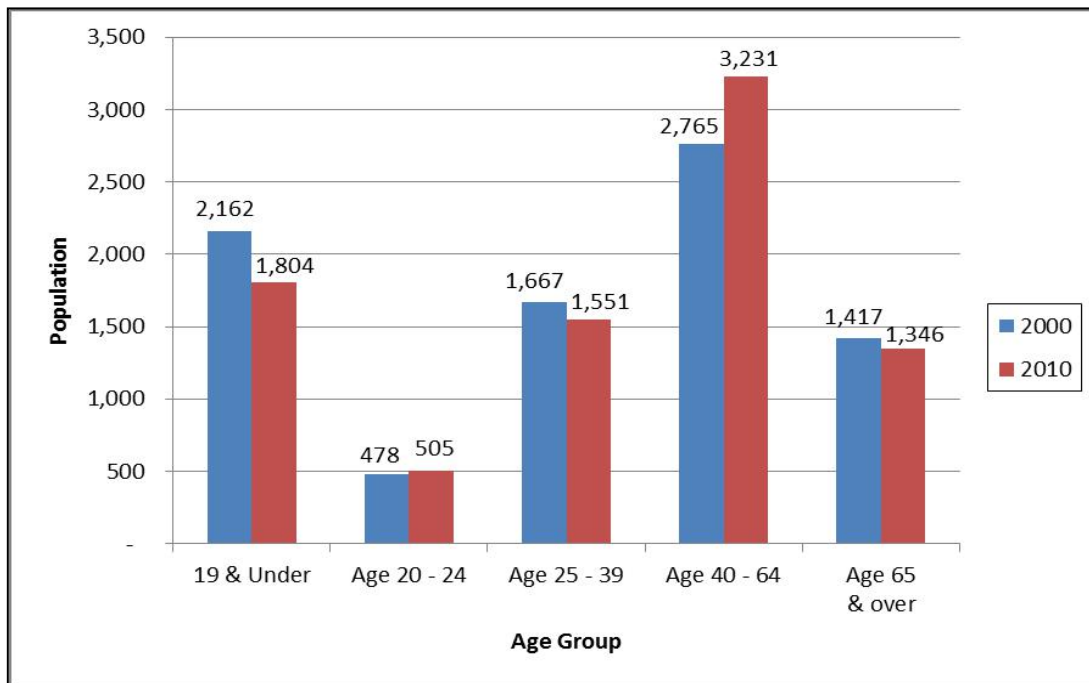
Table 3-1: Population for Montague 1970 to 2010, Comparison to Surrounding Towns, the County and State

Geography	U.S. Census Population					Percent Change	
	1970	1980	1990	2000	2010	2000-2010	1970-2010
Deerfield	3,873	4,517	5,018	4,750	5,125	7.9%	32.3%
Erving	1,260	1,326	1,372	1,467	1,800	22.7%	42.9%
Gill	1,100	1,259	1,583	1,363	1,500	10.1%	36.4%
Greenfield	18,116	18,436	18,666	18,168	17,456	-3.9%	-3.6%
Leverett	1,005	1,471	1,785	1,663	1,851	11.3%	84.2%
Montague	8,451	8,011	8,316	8,489	8,437	-0.6%	-0.2%
Sunderland	2,236	2,929	3,399	3,777	3,684	-2.5%	64.8%
Wendell	405	694	899	986	848	-14.0%	109.4%
Franklin County	59,233	64,317	70,092	71,535	71,372	-0.2%	20.5%
Massachusetts	5,689,377	5,737,037	6,016,425	6,349,097	6,547,629	3.1%	15.1%

Source: U.S. Census Bureau, Census of Population & Housing, 1970, 1980, 1990, 2000, and 2010.

Figure 3-2 displays Montague's population by age group for 2000 and 2010. Between 2000 and 2010, the largest population increase in Montague occurred for residents in the 40-64 age group. This increase was driven by the aging of the baby boomer generation (born 1946-1964) whose members began turning 55 in 2001. The largest population decrease was in the 19 and under age group. This corresponds with a decrease in the child-bearing age group of 25-39 year-olds. Between 2000 and 2010, the number of residents age 20-24 increased slightly, while the population age 65 and over decreased slightly. It should be noted that while the 65 and over age group declined slightly in number, the population aged 60 – 64 increased by 105% over the ten year period, from 280 to 575. As of 2016, these individuals will have already moved into the 65 and older age group.

Figure 3-2: Montague Population by Age Group, 2000 and 2010



Source: U.S. Census Bureau, 2000 and 2010 Decennial Census.

The changes in population age distribution in Montague between 2000 and 2010 were similar to the County and the State, as shown in Table 3-2, which also saw decreases in the 19 and under age group, and an increase in the 40-64 age group. Montague was unique in its decrease in the 65 and older age group; however the percentage of residents in this age group in town (16%) is still greater than the County or State percentages of 15% and 14%, respectively. Overall Montague has an older population than the State or County.

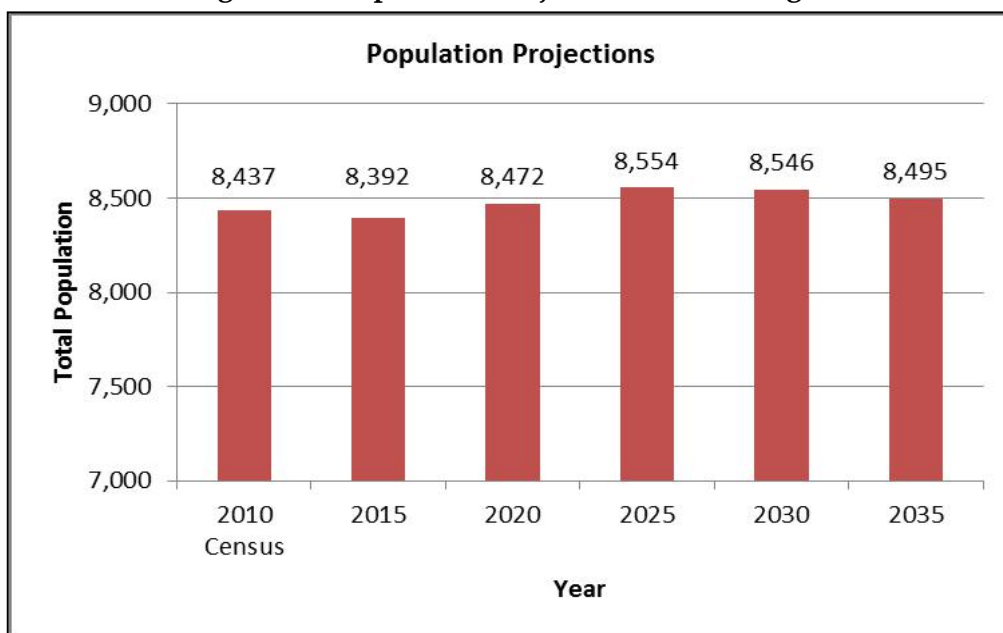
Table 3-2: Percent of Population by Age Group in Montague, Franklin County, and Massachusetts, 2000 and 2010

Age Group	Montague		Franklin County		Massachusetts	
	2000	2010	2000	2010	2000	2010
19 & under	25%	21%	26%	22%	26%	25%
20 - 24	6%	6%	6%	6%	6%	7%
25 - 39	20%	18%	19%	16%	23%	19%
40 - 64	33%	38%	35%	40%	31%	35%
Age 65 & over	17%	16%	14%	15%	14%	14%

Source: 2000 and 2010 U.S. Census.

In 2015, the UMass Donahue Institute published population projections for all Massachusetts cities and towns, projected from 2010 to 2035 at five year increments. Figure 3-3 below shows the projections for Montague's population. Montague's population is projected to increase in the next 10 – 15 years, and then decline slightly for an overall increase of roughly 58 people by 2035.

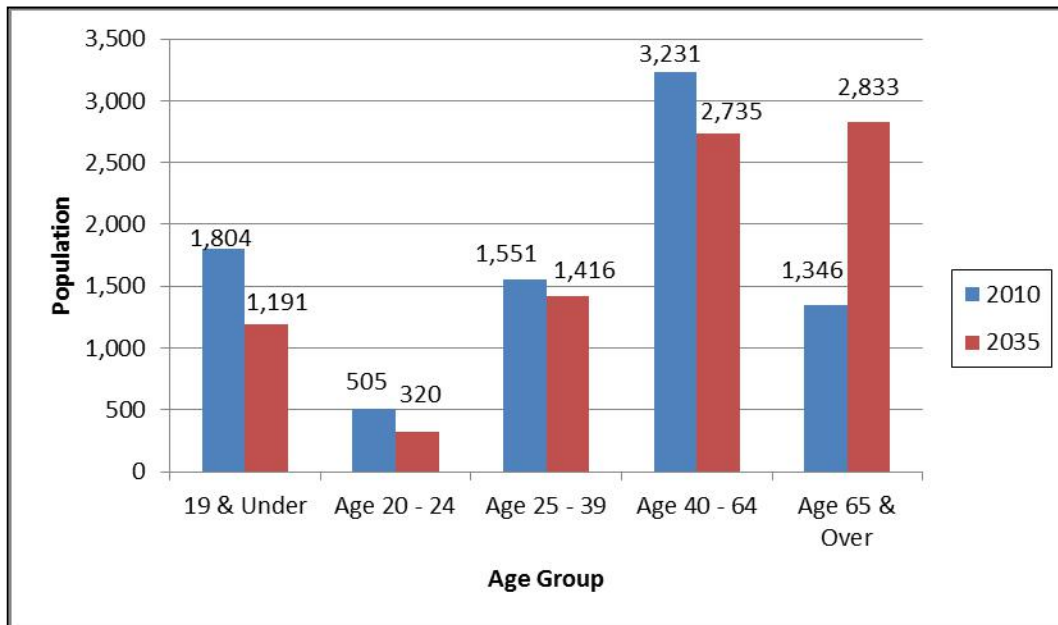
Figure 3-3: Population Projections for Montague



Source: 2010 U.S. Census; UMass Donahue Institute Population Projections. 2015.

While the overall population numbers are not expected to change dramatically, the age make-up of the population is projected to shift significantly in the next two decades. Figure 3-4 shows the projected population by age group for 2035, compared to the 2010 U.S. Census. By 2035 it is projected that the senior population age 65 and over will more than double, representing roughly 33% of the total population compared to 16% in 2010. All other age groups are expected to decline in population during this time.

Figure 3-4: Population Projections for Montague by Age Group



Source: 2010 U.S. Census; UMass Donahue Institute Population Projections. 2015.

Based on population projections for the next two decades, the Town of Montague will need to provide for an aging population in its open space and recreation programming. Seniors require different recreational facilities and services, including accessible walking paths, arts, and leisure programs. At the same time, youth and other age groups will continue to need facilities and programs that can provide safe spaces for recreation as well as access to open space.

C.1.2 Economic Wealth of Residents and Community

Measuring the income of Montague residents is helpful in assessing the ability of the citizenry to pay for recreation resources and programs and access to open space. Table 3-3 describes earning power in Montague compared to the County and the State. Median income figures describe the middle income among residents, thus eliminating any extreme numbers (either the very wealthy or very poor) from influencing the overall figure. Median household figures include data for families, for households of non-related people, and for individuals living alone. Montague's estimated median household income in 2014 was \$47,236, lower than the County and State median incomes. As shown in the table, there is a large disparity between incomes in Turners Falls compared to the rest of the town. The per capita income for the Town (total income for all residents divided by the total number of residents) is estimated to be \$27,214, also lower than both the County and the State. An estimated 17.6% of people live below the poverty line in Montague, which is significantly higher than both the County and the State. Again, there

is a large disparity between Turners Falls and the rest of Montague. An estimated 25.9% of residents in Turners Falls live below the poverty level, compared to 8.7% in the rest of town.

Table 3-3: Median Household Income, Per Capita Income, and Percentage of Residents Living Below Poverty

City/Town	Per Capita Income	Median Household Income	% Below Poverty Level*
Montague	\$27,214	\$47,236	17.6%
Turners Falls	\$24,321	\$39,080	25.9%
Rest of Montague	\$30,393	\$60,726	8.7%
Franklin County	\$29,658	\$54,072	11.9%
Massachusetts	\$36,441	\$67,846	11.6%

Source: 2010-2014 U.S. Census Bureau American Community Survey five-year estimates.

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

C.1.3 Environmental Justice Populations

Median household incomes in portions of Turners Falls, Montague City, and Millers Falls, are less than 50% of the median household income for the State, which qualifies these areas as an Environmental Justice Population area (see Environmental Justice map on page 3-15). The Massachusetts Executive Office of Energy and Environmental Affairs established the Environmental Justice Policy in 2002, with the aim to ensure the protection of low income and minority populations from a disproportionate share of environmental burdens, and to promote community involvement in planning and decision-making to maintain and enhance the environmental quality of their neighborhoods. In 2010 roughly 3,711 people lived within these dense, urban areas of Montague, accounting for 44% of the total population. Approximately 20% of the population within the Environmental Justice areas are children under the age of 18.

Relatively high levels of poverty in Turners Falls, Montague City, and Millers Falls have important implications for open space and recreation planning. To the extent that recreational programs involve fees, a substantial number of the Town's residents may be unable to afford them. Residents may lack transportation to open spaces and recreational sites in other areas of Town. Finally, residents who are already struggling to pay for housing, food and other necessities may be reluctant to support Town expenditures for land acquisition, particularly if they do not have a means of transportation to the land being acquired. It is important that the Town ensure that all residents, regardless of income, have access to open space and recreational resources.

Open Space and Recreation Plan

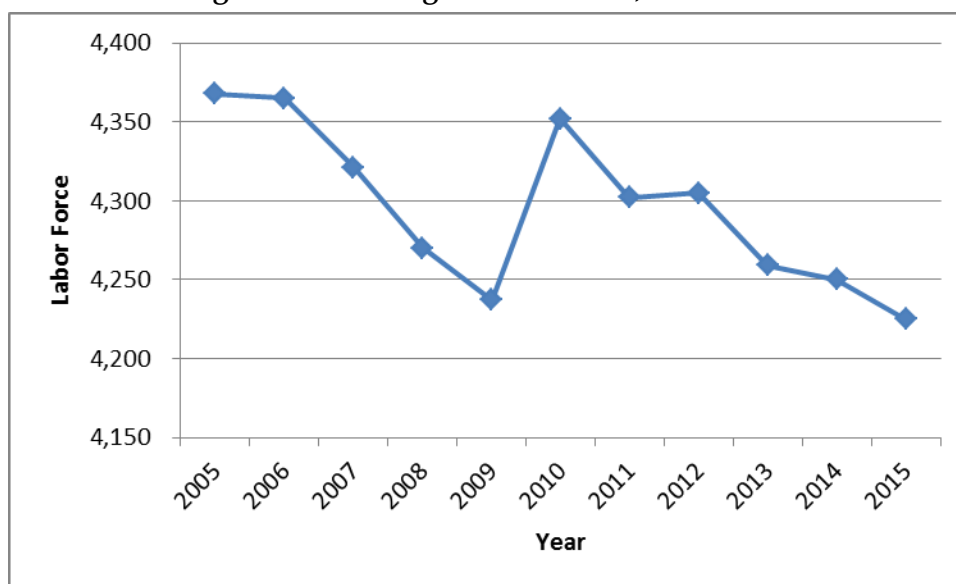


C.2 Labor Force and Employment Statistics

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

Figure 3-5 shows Montague's labor force from 2005 through 2015. The labor force is defined as the pool of individuals 16 years of age and older who are employed or who are actively seeking employment. The labor force refers to Montague residents who may be employed or seeking employment in town or outside of town. Enrolled students, retirees, stay-at-home parents and other persons not actively seeking employment are excluded from the labor force. Montague's labor force has declined from 4,368 in 2005 to 4,225 in 2015. In 2010 Montague's labor force increased suddenly by roughly 100. A similar increase occurred in Franklin County, and may be a result of the Recession. People who previously were retired or not working may have re-entered the labor force to look for employment because of financial reasons. As the population ages in Montague, it is likely that the size of the labor force in town will continue to decline over time.

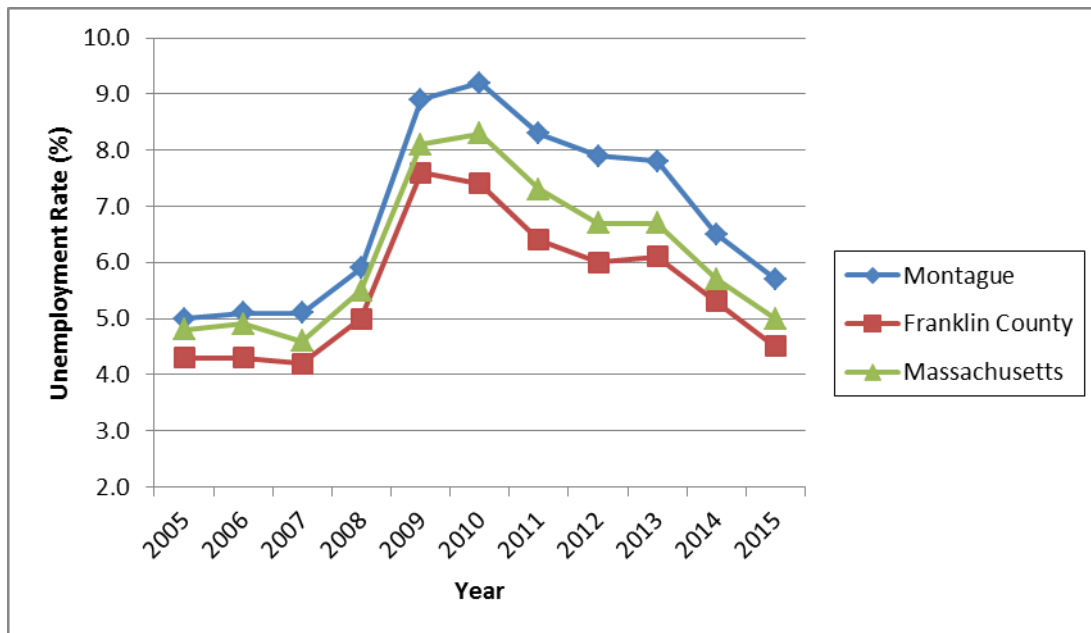
Figure 3-5: Montague Labor Force, 2005 - 2015



Source: Massachusetts Executive Office of Labor and Workforce Development, Labor Force and Unemployment data.

Montague's unemployment rate compared to the County and the State is shown in Figure 3-6 for the years 2005 through 2015. The Town experienced the same fluctuations in unemployment as the County and State over the course of the last ten years. However, Montague's unemployment rates have consistently been higher than both the County and State, and the Town was more severely impacted by the recession in the late 2000s.

Figure 3-6: Unemployment Rates for Montague, Franklin County, and Massachusetts, 2005 - 2015



Source: Massachusetts Executive Office of Labor and Workforce Development, Labor Force and Unemployment data.

C.2.2. Employment in Montague: People who work in town, whether residents or not

Table 3-4 shows the number of establishments and average monthly employees working for Montague employers from 2005 through 2014. This includes residents as well as those who reside elsewhere but commute to Montague for work. The number of establishments has fluctuated over this time period, with a low in 2008 at 213 and a high of 246 establishments in 2010. Overall the number of businesses has increased by 20 since 2005. Despite this overall increase in the number of businesses, during the same period, average monthly employment declined, with a loss of 86 jobs between 2005 and 2014.

Table 3-4: Total Establishments and Employment in Montague, 2005-2014

Year	Number of Establishments	Avg. Monthly Employment
2005	217	2,821
2006	227	2,999
2007	223	2,855
2008	213	2,898
2009	231	2,816
2010	246	2,691
2011	242	2,734
2012	236	2,819
2013	235	2,762
2014	237	2,735
Change, 2005-2014	20	-86

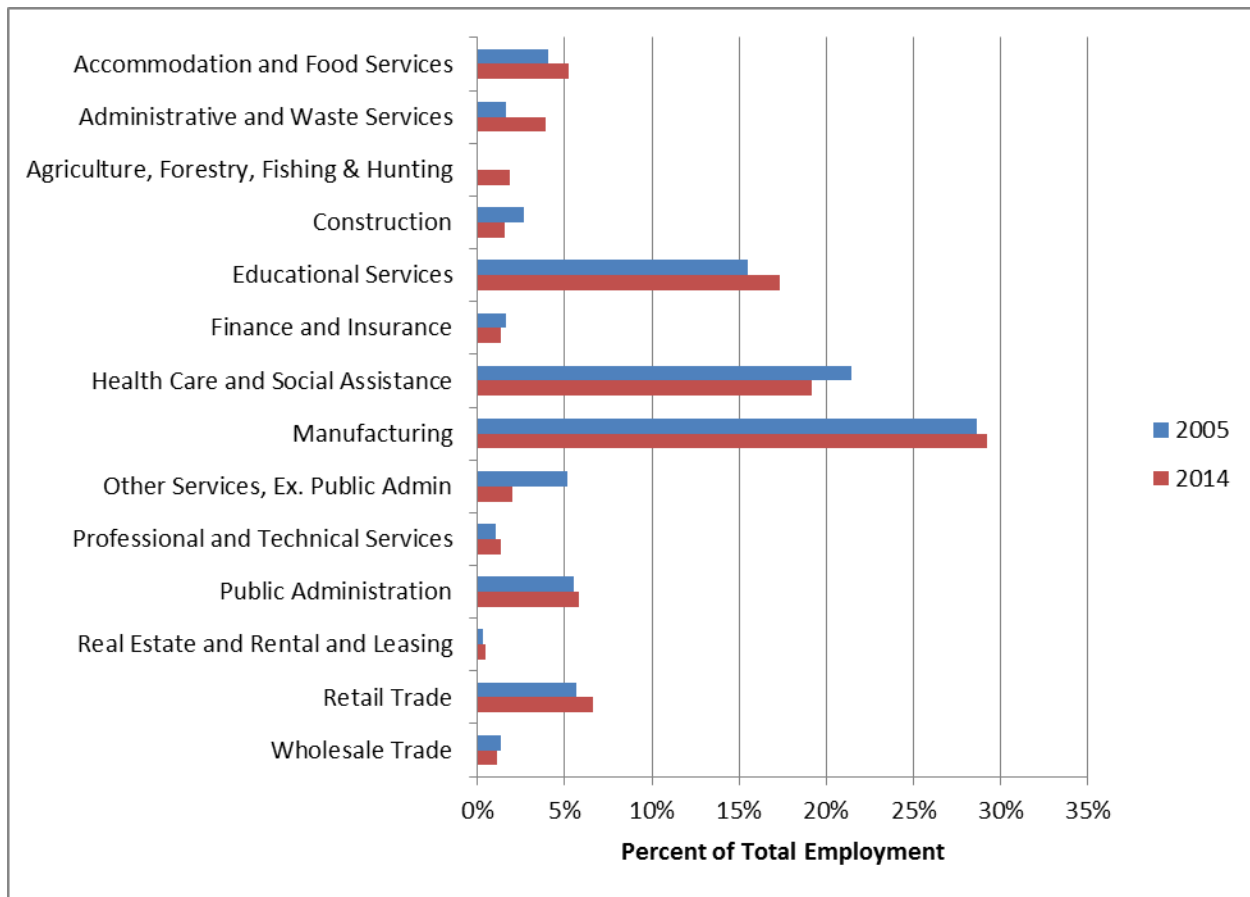
Source: Massachusetts Executive Office of Workforce Development, ES202 data.

Figure 3-7 shows the percentage of total employment for industry sectors present in Montague in 2005 and 2014. Manufacturing currently has a strong presence in Montague, even more so than in the County, comprising 29.2% of jobs within town. This is a slight increase since 2005 when manufacturing represented 28.6% of employment in Montague. In contrast, manufacturing comprised 13.8% of jobs in Franklin County in 2014, a decrease since 2005 when 15.8% of employment within the County was in manufacturing jobs. Health care and social assistance comprised the second largest percentage of employment in Montague in 2014 at 19.2% (down from 21.4% in 2005), followed by educational services at 17.3% (up from 15.5% in 2005).

Home-based businesses are an important source of employment in Montague. In 2015, it is estimated that 6% of Montague's labor force, or roughly 239 individuals, worked from home.⁷ Some of these residents may tele-commute to jobs elsewhere, while others are self-employed.

⁷ 2011-2015 American Community Survey Five-Year Estimates.

Figure 3-7: Employment in Montague by Industry Sector, 2005 and 2014



Source: Massachusetts Executive Office of Workforce Development, ES202 data.

During the 1990s, the Town of Montague experienced the loss of several manufacturing facilities. The Strathmore Paper Company, located in Turners Falls, closed its doors in 1994. This was one of the largest employers in Turners Falls, employing 125 people. Also closing in 1994 was Mohawk Container with thirty-five jobs lost. Indeck Energy Services, employing fifteen, closed in 1996. Railroad Salvage, a retailer located in downtown Turners Falls, closed in 1994 with thirty people losing their jobs. This trend of job losses appears to have shifted in the late 1990s and has continued over the last fifteen years as employment in manufacturing has grown. Growth of industrial businesses located in the town's Airport Industrial Park and an additional industrial area on Turnpike Road account for these gains. Continued growth in manufacturing will likely require development in new areas, which will be addressed below.

In 2016, the Hallmark Institute for Photography closed. Located in the Airport Industrial Park, the private school at one time hosted over 200 students in its 9 month professional program. The school helped attract world class talent and a younger demographic to Montague. The school played a role in creating a stable rental market, as many of the students would rent

apartments in Turners Falls. There have been no other major business closures in Montague within the past seven years.

Montague is also impacted by the closure of the Vermont Yankee Nuclear Power Station in Vernon, Vermont at the end of 2014. The decommissioning of the plant is expected to result in significant economic loss within the tri-county region of Windham County, Vermont, Cheshire County, NH, and Franklin County, MA. Prior to closing, 89% of employees at Vermont Yankee lived in one of these counties. Average wages at the plant were significantly higher than county averages. The loss of these jobs and the spending power of its workers are estimated to result in an overall economic impact of a loss of over 1,100 jobs and \$480 million of annual economic activity in the tri-county region by 2021.⁸ A collaboration of planning and economic development organizations in the tri-county region have been working together to address the current and anticipated economic impacts due to the closure of Vermont Yankee, and include the Brattleboro Development Credit Corporation (VT), Franklin Regional Council of Governments (MA), Southwest Region Planning Commission (NH) and Windham Regional Commission (VT).

It is important to note that industry data is kept confidential if there are less than three reporting businesses within one sector, or if with three or more businesses, one accounts for 80% or more of total employment within the sector. This is the case with the agriculture sector (data was withheld in 2005, however in 2014 the agricultural sector was reported as comprising almost 2% of the jobs in town) and utility sector, two important sectors of the local economy that have a significant impact on the landscape and enormous potential to affect the future of open space, natural resources and recreation in the Town of Montague. Because of their local importance, these sectors are discussed in depth. While tourism has not been a major industry in Montague in recent decades, it could provide a source of income for the town in the future. Therefore the potential for tourism is also discussed below.

Agricultural Sector

Approximately 17% of farmland in Massachusetts is located in Franklin County, totaling 89,772 acres on 780 farms as of 2012. Agricultural trends in Franklin County between 2002 and 2012 show a steady increase in the number of farms and the amount of land being farmed in the County, contrary to national trends. At the same time the size of farms is decreasing. Additionally, the number of farms where farming is the primary occupation of the principal operator has increased in Franklin County.⁹ All of these trends suggest that farming is a

⁸ Economic Impacts of Vermont Yankee Closure. Prepared for the Franklin Regional Council of Governments by the UMass Donahue Institute, December 2014. <http://frcog.org/publication/economic-impacts-vy-closure-study/>.

⁹ U.S. Census of Agriculture, 2002, 2007, and 2012. <http://www.agcensus.usda.gov/>

growing economic sector in the County, where small farms operated as the owner's primary business are surviving and thriving.

In 2015, the Franklin Regional Council of Governments (FRCOG) published the *Franklin County Farm and Food System Project* report. The project summarizes the needs of Franklin County farmers to increase food production, as well as how to make more local food accessible to Franklin County residents, particularly low and moderate income people. Results of a survey of farmers showed a need for access to more farmland, and that farmland is currently too expensive. In Montague, farmers specifically called out a need for more cropland. The survey also indicated a need for assistance with farm transition planning, with nearly 70% of responding farmers 64 years and younger indicating they do not have a transition plan in place for their farm when they retire.

The report includes recommendations for increasing farmers' access to land, such as through land matching and leasing as well as by making public-owned land available for farming, where appropriate. Other land recommendations from the report include increasing the amount of farmland under permanent protection, and preventing land from being converted from farming to other uses, in part by offering farmers more technical assistance with farm transition and estate planning.¹⁰ Ensuring that good farmland remains available and affordable for farming will help continue to support the growth of this important part of the region's rural economy.



Montague has almost 3,000 acres in agricultural use.¹¹ Farms in Montague produce a variety of products, including vegetables, berries, flowers, dairy, maple syrup, honey, pork, lamb, herbs, wool, and wood products, illustrating the diversity of the agricultural sector in Montague.¹² Montague's farms are an important element of the county's agricultural economy and infrastructure. Montague's farmers support agricultural service businesses such as equipment and feed dealers and veterinarians in town and in the region at large. Several of Montague's

¹⁰ Franklin County Farm and Food System Project. Franklin Regional Council of Governments, 2015. <http://frcog.org/wp-content/uploads/2015/11/FRCOG-FC-Farm-and-Food-System-Project-Final-Report-093015.pdf>

¹¹ Montague Right to Farm flyer, Montague Agricultural Commission. http://www.montague.net/Pages/MontagueMA_BComm/Agricultural/RTF%20flyer.pdf.

¹² Based on a search of farms in Montague on the Community Involved in Sustaining Agriculture's (CISA) online Farm Guide: <http://www.farmfresh.org/>.

farms are part of larger agricultural businesses with land in neighboring towns. The health of Montague's farm businesses is critical to the viability of the agricultural sector in Franklin County as a whole.

Finally, agriculture is too closely tied to the landscape of Montague and surrounding towns to be judged by simple economic analysis alone. Fresh food, retention of significant historical landscapes, scenery, and rural character are just a few of the contributions that active agricultural businesses provide to Montague.

Utility Sector

The importance of the utility sector in Montague is due in large part to the continued use of the Connecticut River to generate hydroelectric power. Northeast Utilities repurchased its hydroelectric facilities on the Connecticut River when it went through the deregulation process in 2000. Since then the company was sold to FirstLight Power, a subsidiary of GDF Suez. Station One and Cabot Station, located in Montague, are major sources of property tax revenue for the Town. These facilities and the Northfield Mountain pumped storage facility (owned by FirstLight) located in the neighboring town of Erving provide well-paying jobs for many Montague residents. The utility has made significant investments in these facilities in the past and continues to make upgrades and perform on-going maintenance. The tax revenue and jobs provided by FirstLight are critical to the Town's financial stability.

FirstLight is one of the largest landowners in the Town of Montague. In addition to the actual infrastructure of the Turners Falls Dam and the power canal, the utility owns most of the land along the Connecticut River. Until 1999, it also owned more than 2,000 acres of the Montague Plains. While the Commonwealth of Massachusetts now owns the majority of this property, the utility retained approximately 500 acres for future industrial development.

Ownership and use of land by FirstLight has important implications for open space, natural resources and recreation in the Town of Montague. While use of the Connecticut River to generate hydroelectric power provides economic benefits to the Town, it also has environmental costs. One of the most obvious ecological impacts of the utility's use of the river is the impact of the pumped storage facility, dam and power canal on migratory fish. Upstream fish passage facilities were constructed in 1980 and are located at Cabot Station and at two locations at the Turners Falls Dam. According to the Connecticut River Atlantic Salmon Commission (CRASC), there are ongoing issues with upstream fish passage at Turners Falls which historically has never passed more than 11% of the American Shad that pass the Holyoke

Dam, falling well below the CRASC's goal of a 40-60% passage rate.¹³ Migratory fish passage issues at the Turners Falls fishway are being studied as part of the FERC relicensing process (see below for more information), and may result in improvements to the fish passages and/or changes in operation to increase fish passage.¹⁴

The hydroelectric facilities on the Connecticut River also have impacts on river bank stability and water quality. The Watershed Action Plan noted that the river north of the Turners Falls Dam has experienced daily water level fluctuations since 1970. It was determined that the pumped storage facility and the dam exacerbate bank erosion, sedimentation and turbidity levels. Sedimentation and turbidity have a negative impact on aquatic life. To address riverbank erosion issues, Northeast Utilities (now FirstLight), in cooperation with a group of municipal, state and federal resource agencies, landowners and others known as the Connecticut River Streambank Erosion Committee, developed an Erosion Control Plan in 1999. The plan includes an inventory of riverbank conditions, as well as two distinct action elements: repair of eroded sections of riverbank, and a program of proactive preventative maintenance to minimize future erosion.¹⁵

Since the 1999 Erosion Control Plan, the utility has been required to perform a regular inventory of riverbank conditions, which is published as the Full River Reconnaissance report. Working with the utility, the Connecticut River Streambank Erosion Committee uses this report to prioritize sites for repair. To date, approximately 19,000 linear feet of riverbank have been reconstructed and repaired. Ongoing utility commitment to implementing the Erosion Control Plan is important to maintaining the integrity of the riverbanks and water quality in the Connecticut River in the Town of Montague.

The utility's use of the Connecticut River to generate power is subject to a license from the Federal Energy Regulatory Commission (FERC). Under its license, which is valid until 2018, FirstLight is required to provide recreational benefits to the communities bordering the river. The company currently maintains a public boating facility in Barton's Cove, across the river from Turners Falls in the Town of Gill, a canoe launch at the end of Poplar Street in Montague City, and a park and picnic area along the river in Turners Falls. The utility leases property to the Turners Falls Rod and Gun Club for another private boating facility upstream of Barton's Cove. FirstLight also leases land to the Department of Conservation and Recreation for the

¹³ *Connecticut River Atlantic Salmon Commission: Species Status Report*. Prepared by the Shad Subcommittee of the Technical Committee. June 2015.

https://www.fws.gov/r5crc/pdf/CRASC_Shad_Status_Report_June_2015_Final.pdf.

¹⁴ Personal communication with Connecticut River Watershed Council staff, October 4, 2016.

¹⁵ *Erosion Control Plan for the Turners Falls Pool of the Connecticut River*. Simon & Associates, Inc. 1999. <http://www.restoreconnriver.org/publications.php>.

Canalside Trail Bike Path, an off-road shared use path that begins at Unity Park in Turners Falls, travels along the Connecticut River Canal, and ends in northeast Deerfield. The path is part of the Franklin County Bikeway, and construction was completed in 2008. These facilities provide much-needed recreational opportunities for residents of Montague, and should be maintained.

The FERC relicensing process is a multi-year process that began in 2012 for the Northfield Mountain Pumped Storage Facility and the Turners Falls hydro-electric facilities, with new licenses expected to be issued by April 30, 2018. The process includes a review of how these facilities impact the river and communities through a number of required studies and public meetings. The Town of Montague, along with other local and regional stakeholder organizations, has been an active participant in the process. Specifically, in February 2016 the Town filed comments on the Draft License Application to FERC with the following recommendations:

- Provide public access to the Turners Falls Historic-Industrial Canal District by repairing and maintaining the Strathmore and IP bridges and Canal Access Road;
- Maintain an acceptable minimum flow in the bypass reach of the Connecticut River for recreation and fish habitat;
- Provide Montague residents with adequate, user friendly public access points to the Connecticut River for recreation, especially a put-in below the Turners Falls Dam, cartop boat access at Unity Park, foot access to the Rock Dam, improvements to the Poplar Street access point, and cartop boat access at Cabot Camp; and
- Provide a historical and archeological interpretive framework for the 1676 King Phillips War Battle that occurred in the project area by working with the Town and area tribes to establish and provide funding for a Native American Cultural Interpretive Center in Turners Falls.

Notwithstanding the recreational facilities currently provided by FirstLight, the company's control of the majority of land along the Connecticut River in Montague constrains recreational opportunities for residents. The Poplar Street canoe launch has a very steep grade and limited parking, and is not accessible to older residents or people with disabilities. As noted above, the Town would like to see the development of additional opportunities for non-motorized boating in appropriate areas along the Connecticut River in Montague.

There are two tracts of land owned by FirstLight that merit individual consideration. Cabot Camp has special significance for open space and recreation in Montague. Located at the end of East Mineral Road at the confluence of the Millers and Connecticut Rivers, this property has a long, interesting history. Records dating back to 1799 indicate the presence of a dam and

sawmill at the mouth of the Miller's River on the site. Evidence can still be seen of a lock cut in the rock outcropping at the northeast corner of the site, and a field stone foundation, which may have been part of the sawmill. The original buildings at Cabot Camp served as a tollhouse and carriage house for travelers along this road and the Connecticut River. Some evidence points to a possible tavern on or near the site. More recently, the property served as the summer home of a Mr. Philip Cabot of Boston, who left the property to the utility (Ryan and Lindhult et al., 1999). Cabot Camp is currently shuttered. The property is used without permission by bicyclists, pedestrians, boaters, picnickers and fishermen, and has experienced vandalism and abuse. This property has important scenic, historic and recreational value, and should be maintained for these values.

The second tract of utility-owned land with special significance for open space and natural resource planning is the Montague Plains. As previously mentioned, Northeast Utilities (now Eversource) retained approximately 500 acres on the Plains for future industrial development when it sold land to the state in 1999. The land is zoned Industrial and Agricultural-Forestry 4-acre, and was identified for future industrial development in the 1999 Montague Comprehensive Plan. This property, however, also provides important and rare wildlife habitat. The area has been mapped by the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries, Wildlife and Environmental Law Enforcement as containing priority habitats of rare species, estimated habitats of rare wildlife, and two certified vernal pools (NHESP, 2016). Future development in this area will need to be designed to protect the habitat of rare plant and animal species.

Tourism

Montague's natural, cultural and historic resources have great potential to serve as a draw for visitors. The villages of Turners Falls, Millers Falls, and Montague Center have designated National Register Historic Districts, which does not provide protection of these resources, but does recognize their historical significance and provides access to State and Federal Historic Tax Credits for redevelopment projects. Many homes and commercial buildings in these districts have been restored over the past two decades. The unique history, historic homes and scenic beauty of the village of Lake Pleasant and its Bridge of Names are hidden gems, which also could be promoted as visitor attractions.

Part of the vision developed for the *Turners Falls Livability Plan* portrays Turners Falls as a destination:

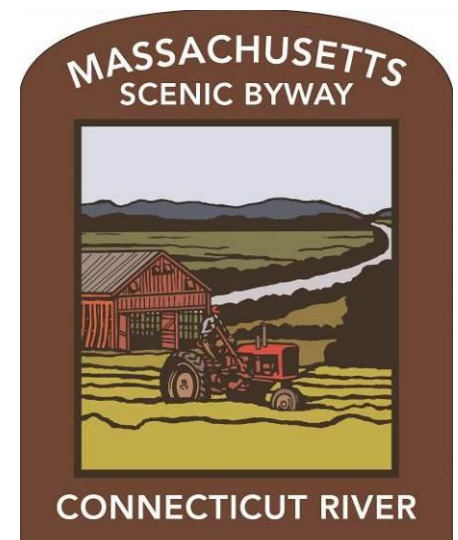
Our unique character and lively street culture draws visitors from around the region, both on a daily basis and for special festivals and events. Turners Falls has been a

gathering spot for more than 10,000 years and today is recognized both as a welcoming live/work community as well as a recreational and cultural destination.

The Plan lists a number of marketable attributes of downtown Turners Falls that may appeal to prospective businesses, creative professionals, and visitors. These include the historic buildings and village layout, the natural beauty of the location, and the significant cultural and recreational amenities, such as the Shea Theater, Great Falls Discovery Center, Unity Park, Peskeomskut Park, artist studios, restaurants, and the bike path. The Turners Falls RiverCulture Project, begun in 2006, is a partnership between the Town and the arts, cultural and business communities that seeks to support and strengthen cultural and creative industries in Turners Falls by hosting and promoting events and marketing the area through a website and printed materials, among other activities. According to the RiverCulture website, events draw thousands of people to Montague each year. In addition, the Great Falls Discovery Center regularly hosts interpretive community walks along the bike path about the industrial, natural, and pre-colonial history of the town.

Recent investment in Millers Falls also provides potential for an increase in visitors and business activity. Montague has a strong tradition of using historic preservation as a driver for economic development through its Commercial Homesteading Program. In 2012 the Town took ownership of several key commercial buildings in downtown Millers Falls that were in danger of being lost. Through the Commercial Homesteading Program, the Town found a developer to take on the redevelopment of the three buildings into a mix of commercial and residential uses. The public/ private collaboration helped spur additional economic activity in the village. Since construction began in 2015, the village has seen the micro-brewery Element Brewing expand, the initiation of the Millers Falls Arts Bridge artist residency program, three new artist galleries, and a new café.

Natural and agricultural resources in Montague's rural areas could serve as a basis for recreation-based and agri-tourism. State Routes 47 and 63 are part of the Nationally-Designated Connecticut River Scenic Byway, and is marketed as part of the Western Massachusetts Scenic Byways campaign and website: <http://www.bywayswestmass.com/>. The Montague Plains Wildlife Management Area, Sawmill River Wildlife Management Area, Dry Hill Conservation Area, Montague Wildlife Management Area and Montague State Forest offer excellent opportunities for hiking, mountain biking, birdwatching and hunting.



The stretch of the Connecticut River between Montague City and the Sunderland Bridge offers beautiful scenery for flat water paddlers, who are often rewarded with the sight of bald eagles fishing for meals. In early spring, the Millers River from the Town of Erving to its confluence with the Connecticut presents a challenging whitewater run for experienced boaters. The Town is interested in the potential of whitewater rafting along the bypass stretch of the Connecticut River in Turners Falls, and is advocating for sufficient water volumes to support rafting as part of the relicensing process for FirstLight's hydropower facilities. The Montague Economic Development and Industrial Corporation (EDIC) have accepted a proposal from Crab Apple Whitewater to develop a Whitewater Rafting Center in Turners Falls.

The new skate park in Turners Falls, completed in 2015, is a huge draw, bringing visitors from all over the Pioneer Valley to skate in town. It has also spurred additional economic activity in the Playground Skateshop. The Canalside Rail Trail bike path and Unity Park waterfront continue to draw visitors to the area. In 2016 the bike path was marked as an attraction on I-91 at Exit 27 in Greenfield. Bike and pedestrian counts conducted on the path in Unity Park during September and October 2016 showed an average daily use of 338 pedestrians and bicyclists.¹⁶

Finally, Montague's farms produce an array of products, some of which are available to consumers directly on the farm. One example is Red Fire Farm, which operates a farm stand and also invites visitors to experience the farm via an interpretive trail. Many restaurants in Montague also feature local produce and brews, providing a farm-to-table experience.

Tourism can bring new jobs, new businesses and increased tax revenues to rural communities. At the same time, increased tourism to a rural community can overwhelm existing infrastructure and potentially harm the resources that attract people to the community. Montague has the resources and basic infrastructure for tourism including parking, restaurants, and the Great Falls Discovery Center. However, the town needs to expand its basic services to support visitors such as lodging, increased shopping opportunities and comprehensive tourist signage. Continued economic development efforts directed by public input will help to keep tourism dollars local, and should strive to protect the resources that attract visitors to the area.

¹⁶ Franklin Regional Council of Governments Traffic Counting Program, October 2016.

D. GROWTH AND DEVELOPMENT PATTERNS

D.1 Patterns and Trends

Historically, growth, development and industry in Montague were concentrated in the five village centers. Each village has distinct patterns of development, shaped in large part by their natural resources.

Fertile soils provided the basis for farming in the village of Montague Center along the Connecticut and Sawmill Rivers. The village green is the historical center of the settlement. The center of the village is densely developed and is bounded by farm fields to the south, west and north that extend to the Connecticut River.

The Connecticut River provided the power for industrial development in the village of Turners Falls, which was laid out in a grid around a power canal. Examples of industries located here in the 19th century include paper and textile mills and a cutlery. Row houses were built in Turners Falls for mill workers. Montague City developed later along the old locks and boat canals, and the Millers River powered factories in the village of Millers Falls.

The village of Millers Falls is unique in that it straddles two towns: Montague and Erving located on either side of the Millers River. The old commercial center of the village is located in Montague, while the large mills were located in Erving. Historically, public services in the village, including mail, water, sewer and fire protection, were shared between the two towns. Montague still pumps sewage from Millers Falls to the Erving wastewater treatment plant, but other services have been separated.

In Lake Pleasant, it was likely the scenic beauty of the lake itself that made the area a destination for followers of the 19th Century Spiritualist Movement. The Spiritualists gathered around the lake in tent camps in the summer, and eventually established a permanent village of tightly clustered Victorian homes on the tiny lots that their tents once occupied.

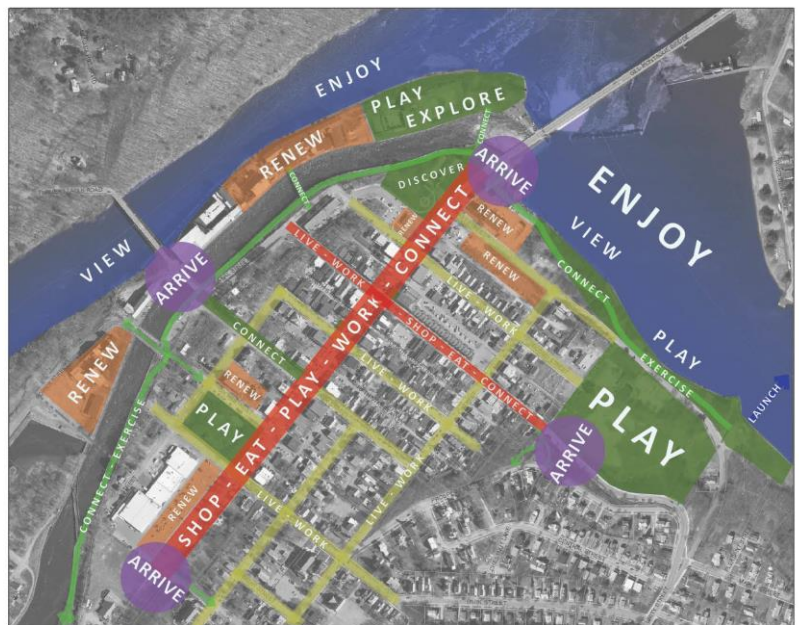
In the center of town lies the Montague Plains, an expanse of scrub oak/pitch pine forest that is the most extensive example of this type of ecological community in the Connecticut River Valley (Motzkin et al., 1999). Wood products were harvested from the Plains in the eighteenth and early nineteenth century. During the late nineteenth century, large portions of the Plains were cleared for farming. Agriculture was abandoned in the early twentieth century (Motzkin et al., 1999), likely due to poor soil fertility. The airport at Turners Falls was established in 1927, two new schools were built in the 1970s, and the Town developed an industrial park adjacent to

the airport during the 1980s and 1990s. There were several proposals for large-scale industrial use of the remainder of the Plains during the late 20th century, but these plans were met with opposition. In 1999 the Commonwealth of Massachusetts purchased almost 1,500 acres of the Plains to create the Montague Plains Wildlife Management Area, permanently protecting this area from future development. Roughly 500 additional adjoining acres remain undeveloped.

Recent residential development has extended beyond the village centers along roads and into forested areas. Commercial/industrial expansion has occurred in the Town-owned industrial park along Millers Falls Road and on Turnpike Road near the old town landfill.

Revitalization of the downtown areas in Turners Falls and Millers Falls is one of the key challenges identified in both the Town's 1998 Comprehensive Plan and the 2004 Community Development Plan. The Town is working to promote adaptive reuse of abandoned industrial sites and storefronts in these villages, and community planning efforts emphasize the importance of developing locally-owned retail, cultural and recreational businesses to draw residents and visitors to the downtown areas. Montague's Commercial Homesteading Program has been successful at encouraging investment in the rehabilitation of vacant or abandoned historic structures in Montague's village centers. Properties obtained by the town for back-taxes are offered for a nominal fee in exchange for the rehabilitation and reuse of the property that is in line with the Town's goals and vision. In 2015 alone, the town stimulated \$3,000,000 of private investment into the preservation and productive reuse of vacant historic properties in Montague.¹⁷

In 2013, residents and businesses in Turners Falls participated in the creation of the *Turners Falls Livability Plan*, which outlines a comprehensive vision for the future of the village. The plan addresses the physical elements of the village – the Avenue A streetscape, pedestrian and bicycle connectivity, recreation



The vision for the future of Turners Falls developed as part of the 2013 Turners Falls Livability Plan.

¹⁷ Town of Montague Planning and Conservation Department website, accessed August 15, 2016: http://www.montague.net/Pages/MontagueMA_Planning/index.

opportunities, and wayfinding – as well as the economics of downtown – cultural activities and events, business support and development, and marketing. The map to the right is a visual display of the vision for Turners Falls. The Town has already begun to implement some of the recommendations of the plan, including Avenue A streetscape improvements, installation of the Unity Park Skate Park, and construction of the Canal Street Parking Lot.

The current industrial park is occupied at close to capacity for large manufacturing operations. The Town has identified a 40-acre site off of Sandy Lane for use as a light industrial park, and is in the planning and design stages. The Town solicited proposals and awarded development rights to a private firm to construct a 6.4 MW solar array at the site to generate \$5.3M in lease revenue plus taxes to the Town over the life of the project. The solar is planned in conjunction with the industrial park as well as planning for a new DPW facility. Development of one or more new industrial park sites could also increase demand for new housing in Montague.

A total of 112 building permits were issued for new homes between 2000 and 2007, all of which were for single family homes. New building slowed beginning in 2008, with only 26 permits issued between 2008 and 2015, reflecting the economic downturn. Two of the permits issued during this time were for two-family homes, while all others were for single family homes.

Much of the new residential construction has taken place in the hilly, forested areas surrounding Montague Center, on Chestnut Hill, Dry Hill and Taylor Hill. This development is predominantly higher-end construction on large wooded lots that are accessible yet not readily visible from the road. On Federal Street and Turners Falls Road, lots are being developed along the road frontage. Residential development is also occurring in existing and redeveloped buildings within village centers: the former Montague Center School is being converted into 22 units; the redevelopment of the Powers Block in Millers Falls will include seven units (three are complete, four are under construction); and 110 and 132 L Street in Turners Falls will contain eight units each (currently under construction).

No new subdivisions have been developed in town since the 1990s. Three subdivisions were built during the 1990s—the tightly-clustered community of Randall Woods near Montague City, which was developed under a Chapter 40B Comprehensive Permit, a publicly-subsidized affordable housing development on Winthrop Street in Millers Falls, and a private development known as Whitney’s Way near the Town boundary with Sunderland.

While development in the hills around Montague Center has had relatively little aesthetic impact, it has raised concerns about increased runoff and flooding due to clearing, grading and

increases in impervious surfaces. A severe flood in 1996 resulted in major washouts on Dry Hill Road. Lack of adequate drainage is also causing runoff problems on Taylor Hill Road.

D.2 Infrastructure

D.2.1 Transportation System

Montague's transportation system consists of three state highways, a network of town roads, rail lines, a limited regional bus system and a small airport. The bicycling network in town includes the Canalside Trail Bike Path; an off-road path completed in 2008, and shared roadway sections of the Franklin County Bikeway. Sidewalks are located in Montague's villages.

State Routes 63 and 47 are the major commuter roads connecting Montague to larger cultural and employment centers to the south. Easy access to Amherst (20 minutes) and Northampton (30 minutes) has made Montague Center an attractive bedroom community for professionals and students. State Route 2 runs along the northern boundary of the Town, connecting Montague to Greenfield and Route 91 to the west and to Erving to the east. Lack of good roads for truck traffic has been consistently mentioned as a barrier to industrial development in Montague. Ongoing safety improvements to Route 2 could remove this barrier and promote the development of the Town's remaining industrial land.

Major Town roads include Avenue A/Montague City Road, connecting Turners Falls and Montague City; Millers Falls Road, connecting Turners Falls and Millers Falls; and Greenfield Road, connecting Montague Center to Montague City. Like many towns in the Commonwealth, Montague is struggling to maintain its roads and bridges. Beginning in 2014, Greenfield Road has undergone a comprehensive renovation, including drainage repair, bridge restoration, retaining wall replacement, and addition of "share the road" signs alerting motorists of cyclists. In 2016, MassDOT completed the Montague City Road Complete Street project, which included traffic calming, a safer bike path crossing, new ADA sidewalks, street trees, and bus pullouts.

Roads in the southeast section of town, including Ripley Road, West Chestnut Hill Road and East Chestnut Hill Road are in need of major drainage improvements. Recent development in this area is likely to make the problem worse. Dry Hill Road is impassible even to 4-wheel drive vehicles in sections. Restoration would require enormous investment.

As of 2016, there were two closed bridges in Town and several others in need of repair. The Greenfield Road Bridge over the B&M Railroad tracks was dismantled in 1999, and is being replaced with a bicycle and pedestrian bridge by 2017. A bridge over the Millers River connecting East Mineral Road to the Town of Erving was redesigned and reconstructed for use as a bicycle and pedestrian bridge in 2005, and will remain closed to vehicles. Major renovations on the Gill-Montague Bridge, which was constructed in 1937 and crosses the Connecticut River and Power Canal in Turners Falls, began in 2010, and were completed in 2014. The \$40.1 million project ensures that the 700-foot long span remains a critical link for industry, commerce and public safety in Montague.

Repairs to the General Pierce Bridge over the confluence of the Connecticut and Deerfield Rivers on Montague's border with Greenfield, formerly listed as "structurally deficient" by MassDOT, was required before work on the Gill-Montague Bridge could begin. MassDOT plans to fully rehabilitate the bridge in 2019. This overhaul represents a main infrastructure priority for the town.

In 2006, the Gill-Montague Transportation Authority, which formerly provided bus service between the five villages of Montague and the towns of Greenfield and Amherst, combined with the Franklin Regional Transit Authority (FRTA) to create one agency. The FRTA now administers and coordinates the combined transit service, serving 41 towns in Franklin, Hampshire, Hampden, and Worcester counties. Three fixed routes currently serve the Town of Montague. In FY 2014, Route 22 Montague-Greenfield, and Route 32 Orange-Greenfield, both averaged roughly 100 passengers per week, which was higher than the system average of 81 passengers per route. Route 23, which formerly travelled from Greenfield to Amherst via Montague, had the lowest ridership out of the six routes offered.

In 2015, the FRTA developed a Regional Transit Plan (RTP) that includes an analysis of current service and recommendations to improve upon the fixed route bus service in the region. Public outreach for the plan showed that people want more frequent bus service, and evening and weekend bus service. In August 2016, FRTA implemented changes based on the RTP that expanded evening hours for some routes. The changes also included modifying Route 23 to terminate in Sunderland Center instead of Amherst, and to add two additional trips. Prior to the changes, Route 23 only operated twice daily. Recently, the Town of Montague worked with the FRTA to upgrade the downtown and Food City bus stops.

According to the 2014 American Community Survey five-year estimates, roughly 9 percent of occupied housing units in Montague do not have a vehicle available to the occupants. In Turners Falls, an estimated 14 percent of occupied households do not have access to a vehicle,

showing that transportation alternatives to the personal automobile need to be available to residents.

Both the New England Central and Boston & Maine railroad tracks run through the Town but do not serve town businesses. The Amtrak passenger train connecting northern Vermont to Washington D.C. stops at the JWO Transit Station in downtown Greenfield. Additional service between Greenfield and Springfield, MA is being pursued for this route. If passenger rail service were developed along an east-west route in the future, it could increase residential development in Montague by making commuting to the Boston area a more viable alternative, particularly if a stop were located in Millers Falls.

Montague's roads are very popular with area cyclists. There are several "loop rides" through the town, and on sunny days in the spring, summer and fall it is not uncommon to see dozens of cyclists on these roads. Popular routes in and through Montague are described in more detail in Section 5.

In addition to the on-road bicycle routes, three miles of the off-road segment of the Franklin County Bikeway run through Montague. The Canalside Trail Bike Path begins in Turners Falls across the street from Unity Park, and runs along the power canal to Montague City, where it crosses Montague City Road and runs across the Connecticut River on an abandoned railroad bridge to Deerfield. With the completion of improvements to Greenfield Road and the B&M railroad bridge, bicyclists will be able to continue along Greenfield Road on a shared roadway section of the Bikeway. The on-road section of the Bikeway also runs along Millers Falls Road from Turners Falls to East Mineral Road, connecting to the Town of Erving over the Millers River.

In 2016 the Franklin Regional Council of Governments (FRCOG) completed a sidewalk inventory in Turners Falls. The inventory covered the downtown area, the Patch neighborhood, and the streets leading to the elementary and middle and high schools. The condition of sidewalks were assessed as either excellent, good, fair, or poor, and will help the Town with prioritizing maintenance projects, new sidewalk construction, and pedestrian safety and accessibility projects. Overall, the inventory found that 75% of sidewalks in Turners Falls are in good or excellent condition. Sixteen (16) percent are in fair condition, and 9% are in poor condition. The sidewalks in poor condition are located primarily in the Patch neighborhood, around X and T Streets, and on Seventh Street west of Avenue A. Despite the overall good conditions of sidewalks, the inventory noted that many sidewalks in Turners Falls are in need of ADA accessibility improvements.

In 2015, the first phase of streetscape improvements was completed along Avenue A to improve the pedestrian environment downtown. The Montague Planning Department secured a \$384,000 Community Development Block Grant to replace 33 downtown streetscape lights to new LED fixtures and install a pedestrian gathering area with a safer pedestrian crossing at the downtown's main intersection of Avenue A and 3rd Street. The Town was awarded funding to install pedestrian lighting within Peskeomskut Park in 2017. These were action items identified in the 2013 *Downtown Turners Falls Livability Plan*. Section 5: Inventory of Lands of Conservation and Recreation Interest, goes into more detail about the *Livability Plan* recommendations.

According to the *Downtown Turners Falls Livability Plan*, although Turners Falls is an excellent place to be a pedestrian or bicyclist, getting to the village on foot or on a bike is significantly more difficult. Coming from Montague City, the bike path is an excellent option; however, adequate sidewalks or bike lanes are lacking on routes approaching from most other directions. Accessing Greenfield by bike or foot is particularly problematic because the shortest route across the 5th street bridge and up Turners Falls Road in Greenfield has no sidewalk and very little shoulder, and cars speed down the hill. Designing and implementing safety improvements for bicyclists and pedestrians on Turners Falls Road is one of the top 25 transportation recommendations for Franklin County in the 2016 *Franklin County Regional Transportation Plan*.

The Turners Falls Municipal Airport is one of only two airports in Franklin County. It currently offers a 3,200-foot long, 75-foot wide runway that can accommodate small single-engine and multi-engine planes and small jets. It is a General Aviation airport, used for transportation, business, recreation, flight instruction and civil defense. Most of the current users of the airport are recreational flyers. Students and families of students from area independent boarding schools use the airport to travel between school and home. There are also some business-oriented travelers, and Pioneer Aviation, located adjacent to the airport, runs a flight school. Use of the airport has declined since its peak in the 1980s.

The current Airport Master Plan calls for an expansion of the runway and upgrades to various facilities. The first phase of the airport's runway expansion project has been completed. During the permitting process for this project, areas of environmental sensitivity and archaeological concern on the airport property were identified. Any proposed reconstruction and expansion of the runway will need to take these environmental and archaeological factors into consideration so that the project avoids impacting these areas. In addition to its transportation function, the airport provides important habitat for grassland birds. It is also used for recreational purposes by birders, walkers, mountain bikers and model airplane enthusiasts.

D.2.2 Community Drinking Water Supply System

The Town of Montague has three developed sources of municipal drinking water. There are two public wellfields located in the village of Montague Center. A single shallow well serves the village of Montague Center and is owned and operated by the Montague Center Water District, which services approximately 160 customers in the village center. The District provides an average annual daily amount of roughly 35,000 gallons to approximately 450 people.¹⁸ Approximately 15 years ago, the District, along with the Turners Falls Water Department and a land trust, purchase 16 acres of land that was to be sold for development, to help protect the drinking water supply.

The Turners Falls Water Department owns and operates two wells in the Tolan Farm well field with an approved withdrawal volume of approximately 1.04 million gallons per day (MGD). Water from the wells is piped to storage tanks with approximately 6.3 million gallons of capacity on top of Wills Hill. The new Hannegan Brook Well located near Lake Pleasant came online in 2014 and functions as a back-up water supply that can yield 1.44 MGD to meet future water demands.¹⁹ The Turners Falls Water Department supplies approximately 7,057 people with drinking water on a daily average, which includes residents and businesses in Turners Falls, Millers Falls, the industrial park, Montague City, and Lake Pleasant.²⁰

The Turners Falls and Montague Center wells are hydrologically connected. During drought or times of high demand, pumping the Tolan Farm wells drains the Montague Center well. There is a valve connecting the two systems that allows the Turners Falls Water Department to supply Montague Center when necessary.

The third source of water is the Lake Pleasant Reservoir, which was the Town's main source of water until 1965. Lake Pleasant is owned by the Turners Falls Fire District. It covers 53 acres and has a storage capacity of approximately 150 million gallons. It is connected to Green Pond, a 15-acre reservoir that holds approximately 40 million gallons. The Turners Falls Fire District owns approximately 1,310 acres of land (MassGIS assessed acreage figure) in the watershed for Hannegan Brook, which feeds the reservoirs.

In 1994, the Department of Environmental Protection (DEP) downgraded the Lake Pleasant and Green Pond reservoirs to an emergency water supply. Under current law, these sources cannot

¹⁸ Personal communication with the Montague Center Water District, October 20, 2016.

¹⁹ *2015 Water Quality Report*. Turners Falls Water Department.

http://turnersfallswater.com/files/Consumer_Confidence_Report_2015.pdf

²⁰ Personal communication with the Turners Falls Water Department, October 5, 2016.

be brought back online for regular use unless the Water Department builds a filtration plant. The cost associated with this project is a significant issue for residents of the district and the town. Abandonment of Lake Pleasant and Green Pond as water supplies could make them available for swimming and other recreational uses. However, according to the DEP, Lake Pleasant is hydrologically connected to the new Hannegan Brook Well, and swimming will continue to be prohibited in the lake. Additionally, the Water Department and Fire District have concerns with allowing swimming in Green Pond due to its relative small size and shallow depth, which could result in high bacteria levels in the summer months.²¹

Geological studies of the Montague Plains have indicated that the area is underlain by a significant aquifer that could serve as a new municipal water supply (Motts, 1971; Lehtinen et al., 1987). Based in part on this information, the Montague Planning Board recommended the protection of approximately 2/3 of the land area of the Plains, corresponding with the region that is believed to recharge the aquifer. In 1999, the Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement (now the Division of Fisheries and Wildlife) purchased 1,490 acres (deed acres as reported in MassGIS open space coverage) of the Plains, including most of the presumed aquifer recharge land.

One study surmised that the Sawmill River Valley has high potential for development as a groundwater source (Natural Resources Conservation Service, 2002). The Montague Center well is located in this area, which due to geology is highly sensitive to pollution. The aquifer recharge area for the Montague Center well is a DEP-approved wellhead protection area, and is further protected by restrictive zoning. Despite these safeguards, there are a number of existing uses in the area, including a junkyard, auto and equipment repair businesses, farms and a railroad line that pose potential threats to groundwater quality.

D.2.3. Sewer Service

Montague has a municipal wastewater treatment facility on Greenfield Road with a capacity of 1.83 million gallons per day of flow; 7,440 pounds Biological Oxygen Demand (BOD) per day and 6,000 pounds Total Suspended Solids (TSS) per day. Treated effluent is discharged to the Connecticut River; sludge is shipped out of town for disposal.

With the exception of Millers Falls, which is served by the Town of Erving's wastewater treatment facility, all of the densely developed areas of town are served by the sewer system, including the remaining four village centers and the Airport Industrial Park off Millers Falls

²¹ Personal communication, Turners Falls Water Department, October 6, 2016.

Road. Sewer service is also available at the old landfill off Turnpike Road, which has been identified as an area for future industrial development. The Riverside section of the Town of Gill is also serviced by the Montague facility.

Areas not served consist of rural areas of Montague Center, including Meadow Road, North Leverett Road and the Taylor Hill and Chestnut Hill areas, Route 47 and Route 63 south of Millers Falls, Dry Hill Road, and Turners Falls Road between Hatchery Road and the Cemetery, Greenfield Road south of Greenfield Cross Road, Hillside Road, Millers Falls Road between the Airport Industrial Park and Winthrop Street, Lake Pleasant and Green Pond Roads and Wendell Road.

Lack of sewer service presents constraints to development in several areas, most notably on privately-owned land zoned for industrial use along Millers Falls Road on the Montague Plains. According to the Montague Highway Department, the current sewer line on Millers Falls Road is almost at capacity and cannot be extended. Extending sewer service to new industrial development on the Plains would require the construction of a new line across the Plains to connect with the line serving Montague Center.

Lack of sewer service also constitutes a barrier to residential development on Chestnut Hill and Dry Hill, where geology constrains the development of private septic systems. Extension of sewer service to Hillside Road, Taylor Hill Road or Wendell Road could significantly increase the potential for large-scale residential development in these areas.

On an annual basis sewer users generated approximately 1 million gallons per day average flow (55% of capacity). Under the NPDES permit, the WWTP is required to do a facilities study when 80% of flow capacity is reached.

In 2002, the Town began a study of its sewage treatment system. The study was designed primarily to assess a Combined Sewer Overflow (CSO) on Greenfield Road approximately 600 feet upstream of the Water Pollution Control Facility. CSOs are structures that discharge a mixture of sanitary sewage and stormwater to surface waters during wet weather. They are a significant source of water pollution and are strictly regulated by the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection. Montague was under pressure from DEP to develop plans to control its CSOs.

The CSO study identified an additional CSO that discharges to the Connecticut River in downtown Turners Falls. Through field investigation and computer modeling, the authors of the study concluded that there was a low level of control for treating combined sanitary and

stormwater flows during storm events. The number of overflow events in the system was relatively high and not isolated to a single location. Each of the CSOs was estimated to contribute approximately 3.5 million gallons of combined flow to the Connecticut River over the course of a year (Camp, Dresser and McKee, 2002).

A study conducted by the Connecticut River Swimming Hole Project of the Massachusetts Water Watch Partnership in 1998 found that fecal coliform counts in the river were higher following wet weather events than during dry weather. Average fecal coliform counts for a sample site at the Rock Dam, downstream of the CSO in downtown Turners Falls, exceeded levels considered safe for swimming. This was also true for two sites located downstream of the Greenfield Road CSO in Sunderland. These results suggested that CSOs in Montague had a negative impact on the recreational potential of the Connecticut River. However, the study also found that during dry weather, the river seemed to be safe enough to support swimming, fishing, boating and similar recreational uses (Walk, Schoen and Godfrey, 1998).

Since the 2002 CSO study, the Town has been committed to controlling its CSOs. In 2005 the Town approved funding for a CSO project and facilities upgrade. Since then two projects in Turners Falls that capture and retain overflow within the sewer system have been completed. A final project on Greenfield Road was completed in 2010 that included construction of a CSO receiving facility at the Water Pollution Control Facility in order to treat the additional flow coming to the plant. The Town continues to monitor and take action to reduce inflow and infiltration.

Testing at the Rock Dam in Turners Falls between July 2008 and September 2009 showed that *E. coli* levels rose above the safe level for primary and secondary recreation only once, during a wet weather event (>0.1 inches of rain over 24 hours). All other test results, including other wet weather events, reported levels suitable for primary contact recreation and secondary recreation.²²

D.3 Long-term development patterns

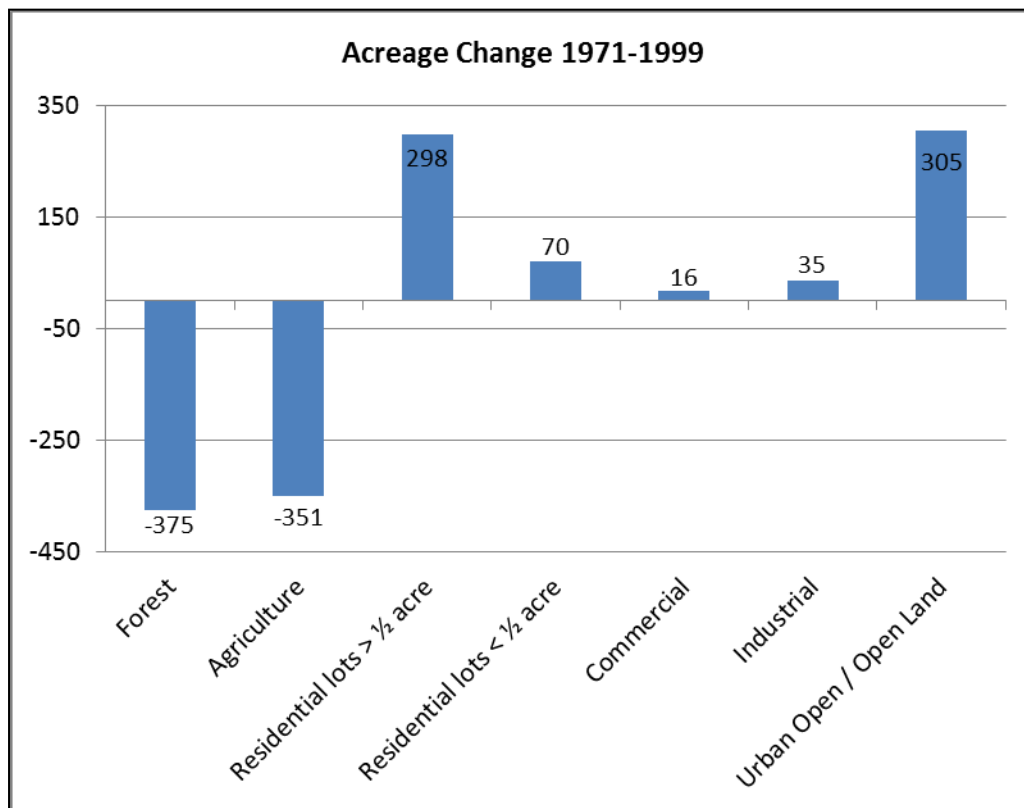
Long-term development patterns in Montague will be affected by both existing and future land use controls, including zoning, by the permanent protection of more land, and by potential changes in transportation and sewer infrastructure.

²² Tri-State Connecticut River Targeted Watershed Initiative, 2009.

D.3.1 Past Land Use Change and Land Use Controls

The major land use changes in Montague between 1971 and 1999 were a loss in forest and agricultural acreage, and an increase in residential development, primarily on lots over a half acre in size, and urban open / open land (Figure 3-8). Urban open refers to land that is in transition from one use to another, while open land refers to vacant land, idle agriculture, and barren areas that do not support large plant growth.

Figure 3-8: Land Use Change in Montague, 1971 - 1999



Source: 1971 – 1999 MassGIS Land Use Data.

The period between 1971 and 1999 in Montague saw the following changes:

- Infill development of high density residential uses in and around Turners Falls;
- Abandonment of commercial and industrial activity on Avenue A between the Gill-Montague Bridge and First Street in preparation for development of the Great Falls Discovery Center
- Increase in the amount of land occupied by the Turners Falls Airport;
- Expansion of the Industrial Park;
- Abandonment of pasture north and west of Taylor Hill;

- Development of ¼ to ½ acre residential lots on Randall Road and in the Randall Wood Drive subdivision;
- Development of residences on large lots along the frontage of Taylor Hill Road, East Taylor Hill Road, Turners Falls Road, Federal Street, Wendell Road, Ripley Road, West Chestnut Hill Road, and Chestnut Hill Loop Road.

It is not possible to compare the most recent land use data from 2005 with the 1971 and 1999 data presented above due to changes in technology and the methodology of data collection and reporting which make comparisons inaccurate. Table 3-5 below provides a summary of the percentage of select land uses in Montague in 2005, the most recent year that land use data was collected. In 2005, approximately 70% of the total area in town was forested, 8% was in agricultural use, 8% was in residential use, divided evenly between low density residential development on lot greater than a half acre, and higher density residential lots on less than a half acre, and less than 1 percent was in industrial or commercial use.

Table 3-5: Summary of Montague Land Use, 2005

Land Use Category	Acres	Percentage of Total Acreage in Town
Forest	14,175	70.5%
Agriculture	1,537	7.6%
Water	871	4.3%
Residential (< .5 acre lots & multi-family)	777	3.9%
Residential (> .5 acre lots)	752	3.7%
Wetlands	472	2.3%
Open Land	450	2.2%
Powerline/Utility	316	1.6%
Urban Public/Institutional	142	0.7%
Recreation	126	0.6%
Commercial	98	0.5%
Industrial	75	0.4%
Other	319	1.6%
Total	20,108	100.0%

Source: 2005 MassGIS Land Use data.

Residential development of frontage lots on existing roads will likely be the dominant short-term development pattern given current zoning. Montague's zoning includes eleven use

districts and three overlay districts, the Water Supply Protection District, the Agricultural Business District, and the Floodplain Overlay District. There are six districts that allow single-family homes by-right, the Residential, Agricultural-Forestry, Agricultural-Forestry – 2, Agricultural-Forestry – 4, Neighborhood Business, and Rural Business, that vary in allowed density. The Central Business District allows single and two-family homes by-right as part of a mixed use development, where the street floor is devoted to commercial use. The Residential District has a 22,500 square foot minimum lot size for single-family homes and is the primary district in the village centers.

There are three types of Agricultural-Forestry Districts that differ by minimum lot size and frontage requirements. The Agricultural-Forestry District has the same minimum lot size requirements as the Residential District and is the largest district south of Turnpike Road and west of Route 63. The Agricultural-Forestry – 2 District requires a two-acre minimum lot size for both single-family and two-family structures, and is located west of Main Street in Montague Center in the Taylor Hill area. There are about 400 acres in this district that could be developed. The Agricultural-Forestry – 4 District has a four-acre minimum lot size for single- and two-family homes and is by far the largest district in Montague. It is primarily located east of the Central Vermont Railroad tracks that run parallel to Rte. 63, but also north of Green Pond to West and East Mineral Hills.

Montague has four commercial districts, Rural Business, General Business, Neighborhood Business, and Central Business. The Rural Business District replaced and expanded the old General Business District in the vicinity of Rte. 63, and includes areas once zoned Residential and AF. The General Business District is located in several areas in Turners Falls, Millers Falls, and along Turnpike and Millers Falls Roads. The Neighborhood Business District is located in densely developed areas of Montague City, Turners Falls, and Millers Falls. In 2010, the Town amended the zoning map to create a Neighborhood Business District in Montague Center, allowing for multi-family uses by special permit, in an effort to support redevelopment of the Montague Center School building. It allows one- and two-family homes by-right, and three- and four-family homes by Special Permit, with minimum lot sizes from 10,000 sq. ft. for single-family home and 15,000 square feet for two-family homes. The Central Business District is located in Montague City and along Avenue A in Turners Falls and along Bridge Street in Millers Falls. This is a mixed-use district, with residences allowed above the street level only.

The majority of Montague's Industrial District is now the Montague Plains Wildlife Management Area, which is permanently protected from development. The Turners Falls Airport and the Franklin County Technical High School are also located within the Industrial District. A Historic Industrial District was created in 2001. This small district is located along

the power canal in Turners Falls, and is designed to encourage redevelopment of vacant, underused and abandoned industrial buildings and sites. Mixed industrial, commercial and residential uses are permitted.

Other districts include Public—Semi-Public, Recreation/Education, and an Unrestricted district. There are also three overlay districts: the Floodplain District, Water Supply Protection District, and the Agricultural Business District. The Floodplain District is located within the 100-year floodplain, and requires new construction to meet State Building Code standards for building within a floodplain and be certified by a professional engineer or architect that the construction will not result in an increase in flood levels. The 2014 Montague Multi-Hazard Mitigation Plan recommends that the Town consider prohibiting all new development within the 100-year floodplain, or require a special permit for development in the floodplain in addition to current requirements. Further restricting development within the flood plain will mitigate flooding risks to homes.

The Water Supply Protection District is located in Montague Center and encompasses the Delineated Zone II Recharge area to the Tolan Farm Wells plus the Interim Wellhead Protection Area for the Montague Center well. In 2010, the Town added a Water Supply Protection District for the Hannegan Brook Well in Lake Pleasant/ Millers Falls. In areas within the WSPD that are not served by municipal sewer systems, the minimum lot size, unless the underlying district's requirements are larger, is 45,000 sq. ft. for single-family homes and 67,500 sq. ft. for two-family homes. Certain uses are prohibited within the WSPD, including business and industrial uses that use hazardous materials and any other uses that typically use materials potentially harmful to drinking water supplies. The Planning Board may grant a Special Permit for the following uses within a WSPD: the rendering impervious of more than 20 percent of the area of a single lot; any use retaining less than 50 percent of the lot area in its natural vegetative state; and commercial trucking or other motor vehicle uses and associated uses.

According to the Montague Zoning Bylaw, "the purpose of the Agricultural Business District is to maintain the viability of agricultural businesses by conserving land with productive soils in large, contiguous blocks and minimizing conflicts between agricultural operations and residential uses, and to identify an area of town where other policies should be developed to promote and facilitate commercial agriculture." The overlay district is located within a portion of the AF district in the southwest portion of town and encompasses farmland and prime agricultural soils along the Connecticut and Sawmill Rivers. The Overlay District restricts earth removal unless related to agricultural uses, and allows only by Special Permit the rendering impervious of more than 25% of a lot or more than 21,780 feet, whichever is less, for non-agricultural use. The District also has a set of Special Permit criteria aimed to locate

development in areas least suitable for agriculture, and to minimize the impact on agricultural operations.

Back Lot Developments are allowed within the Agricultural Business Overlay District by Special Permit. Back Lot Development allows lots that do not have adequate frontage to be built upon in exchange for protecting farmland along roadways that is vulnerable to approval not required (ANR) development. Back lots are accessed via a common driveway, and are located on areas of a parcel with the least agricultural value. The intent is to avoid development of prime farmland soils and to maintain contiguous parcels of agricultural land, however, no backlot developments have been created yet in town. The Town could incentivize this type of development by providing a density bonus for protecting a certain number of buildable ANR lots.

Montague's current zoning will create a development pattern that is more diverse than in many surrounding communities, but will not result in conservation of the rural and small town village character that many residents value. Montague zoning supports dense village center housing and a variety of residential lot sizes from ½ acre to 4 acres in the rural areas. Montague also encourages mixed commercial and residential uses in three of its village centers. The bylaws could be revised to further encourage revitalization and infill development downtown and in surrounding village neighborhoods. An analysis completed for the 2015 Montague Housing Plan revealed that many existing lot sizes within the villages do not meet current minimum lot size requirements in the zoning. Many lots fall below the 10,000 and 15,000 square foot minimums for single family and two-family dwellings within the Central Business (CB) and Neighborhood Business (NB) districts, and the same is true within the Residential (RS) neighborhoods surrounding the central village areas. These lots are required to have just over a half acre for a single family home, with an additional half acre for each additional dwelling unit. This results in many non-conforming lots and buildings, which require property owners to go through a Special Permit process to alter a building or build on a vacant lot.

The Town could improve upon the preservation of open space and natural resources through implementing an open space design bylaw to allow for new housing while also protecting forest or farmland. The Montague Planning and Conservation Department is working with the Franklin Regional Council of Governments (FRCOG) on drafting an open space design bylaw as well as other possible zoning changes that could better protect Montague's natural resources while encouraging development in areas of town where infrastructure and other amenities are available to support new housing, commercial or industrial development.

The expansion of infrastructure can bring opportunities for growth and development to an area previously constrained. The public sewer system is particularly important in considering the potential for growth. New sewer lines facilitate new development. Therefore, sewer infrastructure should be expanded strategically to ensure that new industrial development occurs away from sensitive natural resources, and that new dense residential development is located close to infrastructure, services and existing development. Second, state septic regulations known as “Title 5,” often results in petitions to towns to rescue residents with problem septic systems. Expanding sewer to areas with physical and hydrogeologic constraints may open up other areas to future development. Third, expansion of sewer lines increases the cost of upkeep and repair to the town, particularly with respect to infiltration and inflow problems. Finally, new demand for public sewer service may require expansion of the wastewater treatment capacity, which can be very expensive.

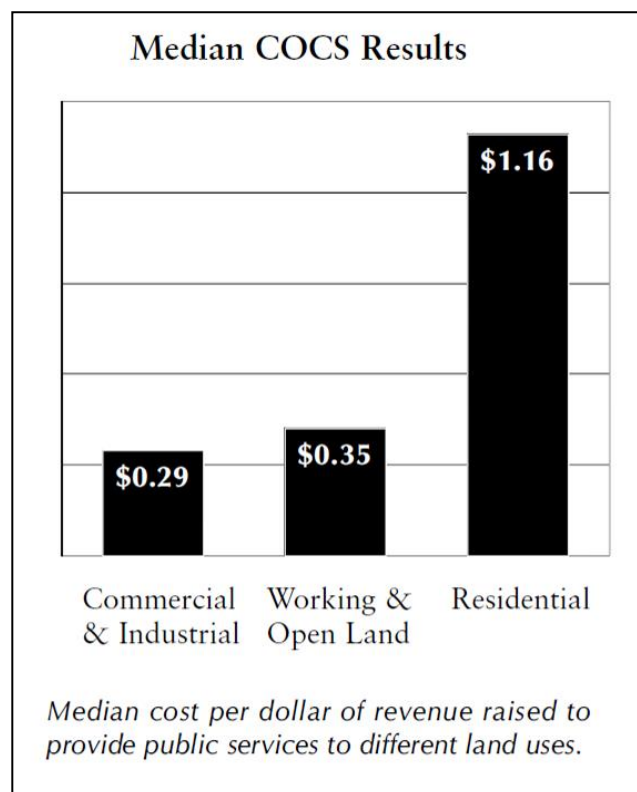
Although Montague has zoning that is designed to promote more viable downtowns, village centers, agricultural areas and rural forested landscapes, sprawl of roadside frontage lots is the current development pattern occurring in Montague today. This development pattern will diminish the differences between the villages and rural areas of town. Montague’s zoning allows for half-acre lots in the AF district, where a large amount of road frontage is agricultural land. In the AF-4 District, zoning encourages the development of homes on large lots, with few constraints except for steep rocky soils.

The challenge for Montague and other communities is to find a model for growth that protects vital natural resource systems and maintains a stable property tax rate. It is important to understand the fiscal impact of different land uses. For instance, open space, residential, and commercial/industrial development each contribute differently in the amount of property tax revenues generated and they often require different levels and types of municipal services. .

The American Farmland Trust (AFT) and other organizations have conducted Cost of Community Services (COCS) analyses for many towns and counties across the country. A COCS analysis is a process by which the relationship of tax revenues to municipal costs is explored for a particular point in time. These studies show that open spaces, while not generating the same tax revenues as other land uses, require less public services and result in a net tax gain for a community. Residential uses require more in services than they provide in tax revenues compared to open space, commercial, and industrial land uses. Communities, at the time of the study, were balancing their budgets with the tax revenues generated by other land uses like open space and commercial and industrial property.

Figure 3-9 demonstrates the summary findings of 151 COCS studies from around the country. For every dollar of property tax revenues received from open space, the amount of money expended by the town to support farm/forestland was under fifty cents while residential land use cost over a dollar. Taxes paid by owners of undeveloped farm and forestland help to pay for the services required by residential land uses. When a town has few land uses other than residential, homeowners and renters pay the full cost of the services required to run a municipality, maintain public ways, and educate young people. In this way, local property real estate taxes tend to rise much faster in communities that have little protected land and higher rates of development.

Figure 3-9: Summary of Cost of Community Services (COCS) Studies



Source: American Farmland Trust; 2010. <http://www.farmlandinfo.org/cost-community-services-studies>

In 2009 a COCS study was completed for the Town of Deerfield, and may provide a useful local example for Montague. In Deerfield the study found that:

- 79 percent of fiscal revenue in fiscal year 2008 was generated by residential land, 9 percent was generated by commercial land, 9 percent by industrial land, and 3 percent by farm and open land.

- 90 percent of expenditures were used to provide services for residential land compared with 5 percent for commercial land, 4 percent for industrial land, and 1 percent for farm and open land.

In other words, in fiscal year 2008:

- For each \$1 of revenue received from residential properties, Deerfield spent \$1.14 providing services to those lands.
- For each \$1 from commercial land the town spent 55 cents,
- For each \$1 from industrial land, the town spent 47 cents providing services; and
- For each \$1 received from farm and open land, the town spent 33 cents.

Residential land uses created a deficit of \$1.7 million, while the other three categories generated surpluses: \$573,397 from commercial, \$608,422 from industrial, and \$318,842 from farm and open land. While residential land use contributes the largest amount of revenue, its net fiscal impact is negative.²³

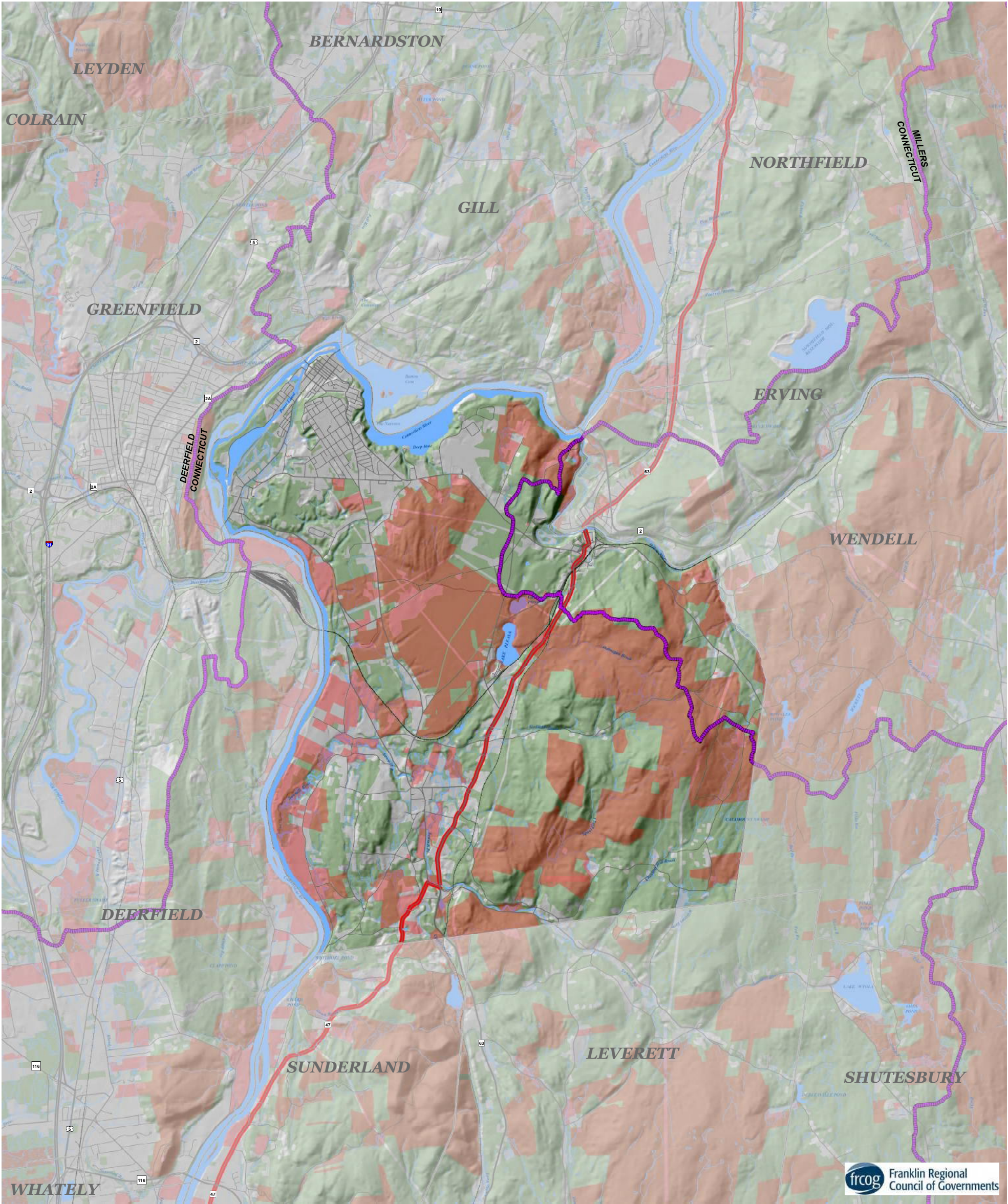
The studies provide a fiscal argument for protecting open space, and for implementing good land use planning on the local level. The studies are not meant to encourage towns and cities to implement exclusionary zoning that seeks to make it difficult to develop housing, particularly for families with school age children, who require more in services. As mentioned previously in this section, downtown Turners Falls and Millers Falls are identified as priority development areas in Franklin County for mixed use development into the future. There is also a pent up housing demand in the County as a result of the slow housing market during the recent recession. Focusing new housing development within downtowns and surrounding neighborhoods will help maintain the open space that provides a net revenue gain to the town, and at the same time meet the housing needs of the population while creating more vibrant villages.

The second component of a balanced land use plan concerns the development of other tax-generating land uses. The AFT studies show that for every dollar of taxes generated by commercial and industrial uses, the cost to towns for these uses resulted in a positive net gain. Patterns of commercial and industrial uses vary considerably between towns, and positive fiscal impact is only one of several important factors that need to be considered when encouraging this type of development. It is just as critical for communities to consider the impact of commercial and industrial development on quality of life. Montague has long-supported the

²³ *The Economic and Fiscal Contribution of Farm and Open Land in Deerfield, Massachusetts*. American Farmland Trust, September 2009.

redevelopment of existing buildings within its villages for commercial and industrial uses that would preserve the historic character of the area, provide jobs close to where people live, and help to eliminate blight from neighborhoods. The *Turners Falls Livability Plan* includes a market study and numerous recommendations for expanding businesses in downtown Turners Falls. Montague also continues to plan for a new light industrial park off of Turnpike Road that would provide much needed space for new industrial businesses in a location that is accessible to many residents and on a bus route.

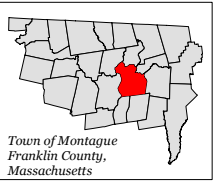
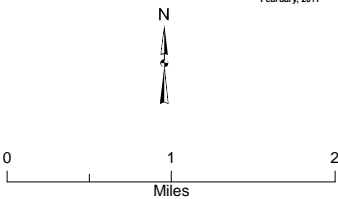
By pursuing strategies that combine active land protection, zoning measures that direct development while protecting natural and historical resources, and sustainable economic development, Montague can continue to grow and stabilize its property tax rates while maintaining its historic villages and rural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

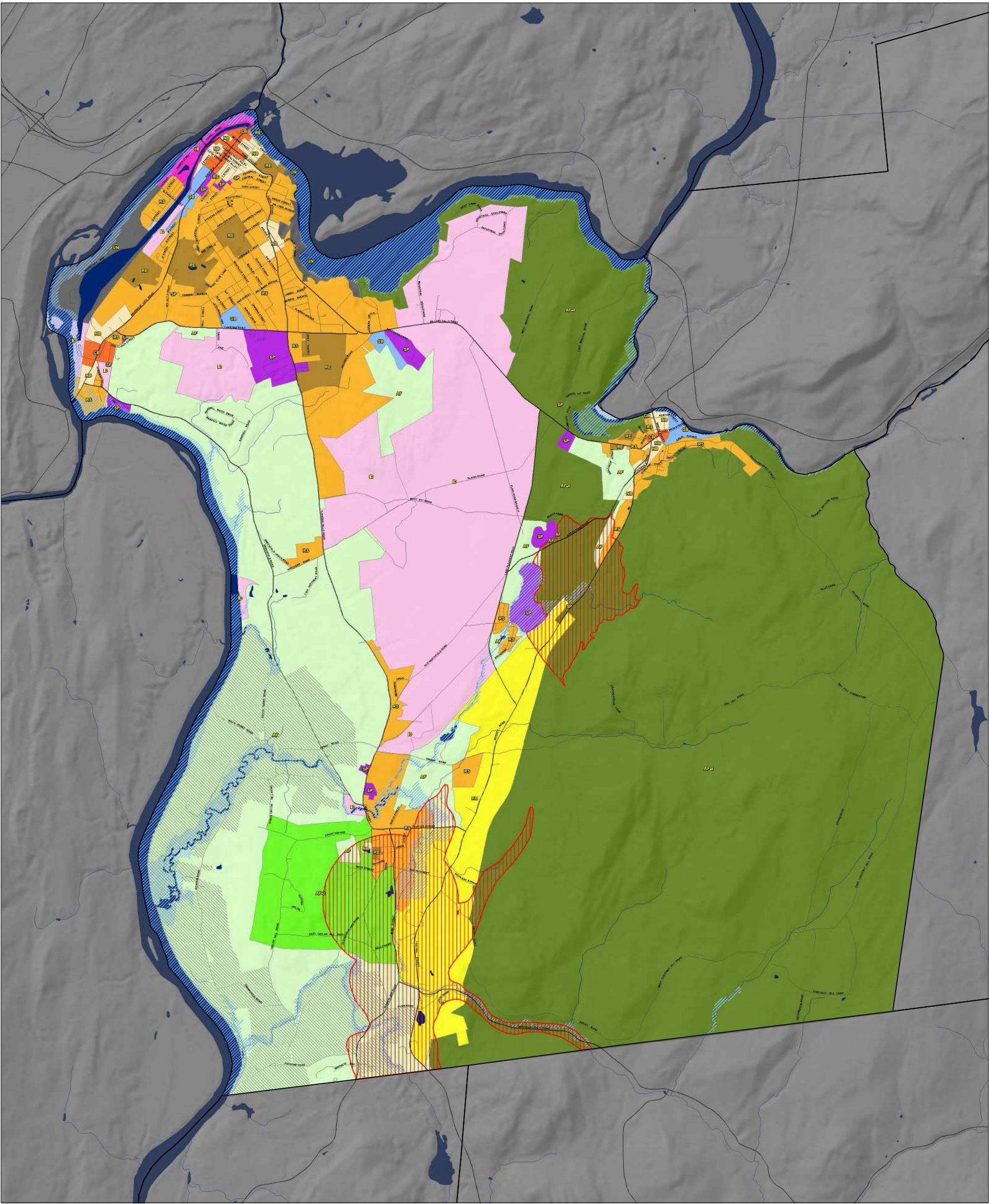


Town of Montague

Regional Context Map

- Contiguous Forest
- Permanently Protected Open Space
- Rail
- Major Road
- Watershed Boundary
- Connecticut River Scenic Farm Byway





Montague Zoning Map

100 Yr Flood Plain

Major Road

Road

River, Stream

Water Body

Zoning District

Agricultural - Forest (AF)

Agricultural - Forest 2 (AF2)

Agricultural - Forest 4 (AF4)

Central Business (CB)

General Business (GB)

Industrial (I)

Historic Industrial (HI)

Neighborhood Business (NB)

Public/Semi-Public (PS)

Residential (RS)

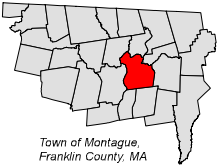
Residential Education (RE)

Rural Business (RB)

Unrestricted (UN)

Agricultural Overlay District

Water Supply Protection District



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS



SECTION 4

A former minister in Montague, David Cronyn, was asked what salary he got. "Fifteen hundred dollars," was the reply, a very substantial sum in those days. Surprise was expressed, whereupon the minister explained: "I get five hundred dollars in money and a thousand in scenery." (Pressey, 1910).

ENVIRONMENTAL INVENTORY AND ANALYSIS

The scenic landscape of the Town of Montague 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 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; 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, fish, reptiles and amphibians.

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, recharge water to the ground, and retain it during droughts. These functions are vulnerable to the impacts of land development. Construction in and around wetlands not only displaces the animals that depend on this ecosystem, it may also result in increased flooding, storm damage, and reduction in the quality and quantity of drinking water.

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

A. TOPOGRAPHY, GEOLOGY, AND SOILS

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

A.1 Topography

The topography of the Town of Montague is one of sharp contrast. The Connecticut River Valley in western Montague is broad and flat and encompasses much of the prime agricultural land in town. The Montague Plains, which spans the western and central portions of Montague, is also an area of flat terrain. Moving east, the landscape changes to rolling hillsides. Although steep slopes can be found throughout the town, the eastern half of Montague is significantly higher than the rest of town, with an average height of 900 feet above sea level, and a high point of 1400 feet at Dry Hill.

A.2 Geology

The land that makes up the Town of Montague is the result of hundreds of millions of years of geologic history: great upheavals of the earth's crust and the sculpting power of moving ice, water, and wind. This distinctive physical base has determined the distribution of the Town's water bodies, its soils, vegetation, and its settlement patterns, both prior to and since colonial times.

Between 430 and 280 million years ago, collisions of the earth's tectonic plates folded the earth's crust, built mountains, broke it along faults, and produced the contorted layers of



metamorphosed rock that underlie most of New England. Erosion-resistant gneisses underlie the high terrain in the easternmost portion of town. Known as the Dry Hill and Fourmile gneisses to geologists, they originated over 600 million years ago as chains of volcanic islands, similar to modern day Indonesia and Japan, that traveled from the south pole north to the equator due to continental drift. Such island chains, along with other continents, became part of North America during a series of slow collisions that lasted from approximately 430 to 280 million years ago, culminating in the formation of the super-continent Pangea. These collisions uplifted the earth's crust into the northern Appalachian mountains, smearing, contorting, and metamorphosing the volcanic and sedimentary rocks of those island chains into the gneisses and schists we see exposed at Pigpen ledges, Chestnut Hill, and Dry Hill today. Pangea began to break apart almost 250 million years ago during the Triassic and Jurassic epochs. This created a chain of large rift valleys extending from Nova Scotia to the southern Appalachians, the largest of which widened to become the Atlantic Ocean. The Connecticut Valley was one of many smaller, ancillary rift valleys that developed as part of this chain.

During the Mesozoic era, ~250 to 70 million years ago, the Connecticut Valley looked much like modern-day Death Valley. Streams cascaded out of gorges in the high mountains to the east and north, slowly eroding them and bringing alluvium, including gravels, sand and silt, to rest in small lakes, riverbeds, and giant piles of sediment known as alluvial fans, in the Valley below. The rifting of the earth's crust also caused fissures in the earth to open up and lava to spread out across this landscape on top of these sediments, only to be buried by further alluvium. These sediments and lava later lithified to become the red sandstones of the Sugarloaf Formation, the Deerfield Basalt, the shales, limestones, and mudstones, of the Turner's Falls Formation, and the bouldery conglomerates of the Mt. Toby Formation. All of these today can be seen exposed in the long ridges in the middle of the Valley, Wills Hill on the Montague Plains, and in the bed of Connecticut River at Turner's Falls, the Rock Dam, and Barton Cove. The Deerfield Basalt is more erosion-resistant than the sandstones lying underneath, and forms the top of the long ridge starting at North Sugarloaf in Deerfield and extending north along the Pocumtuck and Poet's Seat ridges to Canada Hill on the Montague-Greenfield border. The thick, layer of bouldery-conglomerates that make the Mount Toby formation form the bulk of Mt. Toby in Sunderland and Taylor Hill in Montague Center, and are deposits of a large alluvial fan that represents the top of the pile of sediments that were deposited into the Valley by rifting.

At the time, the area that is now the town of Montague was located just north of the equator. The Dinosaur era had begun, and the footprints of these giant reptiles, and small fossils of the plants they ate, are still found in the Turners Falls Formation. These dinosaur footprints were famously quarried across the Connecticut River at Barton's Cove in Gill. Dexter Marsh, a day-laborer and amateur geologist born in Montague, is widely credited with their discovery as he noticed the footprints, which he called "turkey tracks", in paving stones he was laying in Greenfield in 1835.

Continental rifting and associated movement along faults, and earthquakes, continued until about 75 million years ago, with the mountains to the east and west of the Valley continuing to

be uplifted as the Valley continued to sink, partially under the weight of the sediments being deposited in it. These faults are no longer active, but broken rock along them forms distinctive topographic features today. The confluence of the Fall and Connecticut Rivers just below the Turners Falls dam occurs along one of these faults— several smaller, associated faults to this can be seen in rock exposures of the Turners Falls Formation below the dam in the Power Canal. The most prominent fault associated with this rifting is the Eastern Border Fault, which forms the boundary between the older, metamorphic rocks of the uplands in the eastern portion of Montague and the younger Mesozoic sedimentary rocks underlying the majority of town in the Valley. The abrupt topographic boundary along the eastern edge of town marks the contrast of these two types of rock across the fault. This fault enters the town from the north under the Connecticut River at its confluence with the Millers River at French King Rock, and heads almost due south along the eastern edge of the Mineral Hills, under Green Pond and Lake Pleasant to Cranberry Pond and the steep eastern slope of Mt. Toby in Sunderland.

After the end of the Mesozoic era, marked by the extinction of the dinosaurs approximately 65 million years ago, most of New England continued to erode during a period of relative tectonic quiescence, slowly forming a rolling landscape similar to that which we recognize today. Present-day sedimentary rocks are the very bottom deposits of what is thought to have been a much wider, and deeper, rift valley prior to 75 million years ago that likely covered almost the entire western half of the state.

Beginning two million years ago, accumulating snow and ice in glaciers to the far north began advancing south 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, began about 100,000 years ago and completely covered New England before it began to recede from its southern extent in Long Island Sound about 20,000 years ago. This last ice sheet scoured and polished the land into its final form, leaving layers of debris and landforms that are still distinguishable.

The glacier left gravel and sand deposits along its margins at the edge of the Connecticut River Valley, and small “perched” glacial lakes from meltwater coming off of the glacier flowing east and west into adjoining river valleys, notably along the Sawmill River Valley east of Route 63, and along the Leverett border, which drained through Rattlesnake Gutter into Leverett Center. 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.

As the last ice age ended approximately 20,000, the ice sheet began receding northward with several large, inland glacial lakes forming along the sheet’s southern margin. One of the largest in New England was Glacial Lake Hitchcock in the Connecticut River Valley, which existed at a stable level between 18,000 and 15,600 years ago. 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. The Montague Plains, Turners Falls airport, and much of the higher elevation portions of Turners falls are all on top of the Montague Delta, which was deposited by the Millers River entering Glacial Lake Hitchcock beginning about 16,000-15,600 years ago when the southern margin of the ice sheet was at Turner's Falls. It is formed of well-drained delta sands, and bands of silts and clays are found on its western edge, which forms the abrupt break in slope along Turners Falls Rd. The Lake bottom sediments form the impermeable "varve clay" which underlies the delta and much of the town within the Connecticut River floodplain.

The Lake began to drain and its levels became unstable beginning approximately 15,600 years ago, exposing the glacial lake sediments to wind, erosion, and melting permafrost. Several of these glacial lake features can be seen around Montague today. Drumlins, which are thick, oblong accumulations of glacial till, are found throughout town, with a particularly excellent example being the low long hill on the high land in Montague City. Kettle holes, which represent large blocks of "stagnant ice" left behind by the ice sheet, are represented by Green Pond and, in part, Lake Pleasant. Pingo scars, which are permafrost features, are abundant at the base of the eastern slope of Taylor Hill, east of Meadow Road. After the lake drained, wind moved much of the sandy lake bottom sediment into extensive "eolian" sand dune deposits that overlie much of the Montague Delta. Modern day streams and rivers also found their present day courses, and re-worked pre-existing glacial deposits, as the earth's crust "rebounded" from the weight of the 2-mile thick ice sheet, beginning about 15,600 years ago, and Montague steadily rose almost 750 feet in elevation. This caused smaller rivers and streams to carve steep-sided gorges into bedrock and the pre-existing glacial deposits: the Millers and Sawmill rivers being prime examples of "meander belts" as they cut through their own, older, river deposits.

A.3 Soils

As a result of these complex origins, soils vary widely throughout the town. The Natural Resources Conservation Service (NRCS) soil surveys identify 58 distinct soil types in Montague. The most common types of soils found in town include the Windsor, Chatfield-Hollis, Canton, Yalesville-Holyoke, and Merrimac series. Over a third of the town consists of well-drained soils with low to moderate slopes that may support development. These areas include the Montague Plains, the Airport Industrial Park, already developed areas of Turners Falls, Millers Falls, and Montague Center, areas along Route 63, and pockets of farmland and woodlands in the southwest corner of town. Development in other areas of town may be constrained due to steep slopes – including much of the area east of Route 63 – and soil characteristics that impact septic system viability, such as shallow depth to bedrock or a high water table.

Different recreational uses are constrained by different soil and topographical characteristics. Sports fields require well-drained soils and level topography, whereas lands with slopes greater than 25 percent are attractive to mountain biking and hiking enthusiasts. The level topography of the Plains makes it well suited for walking, birding and mountain biking, as well as appealing to users of all-terrain vehicles and snowmobiles. Erodibility of soils has important

implications for the impact of recreational uses. Erodible soils include those that are shallow, wet, sandy, or sloped, or those with a combination of these characteristics. Hikers, mountain bikers and ATVs can create and exacerbate erosion on steep slopes and in sandy soils. Erosion due to use of unauthorized, illegal use of ATVs on the Montague Plains has been particularly severe.

Unauthorized ATV use within a dirt utility access road on the Plains diverted the Wills Hill Brook and eliminated the hydrologic connection to a southern abutting wetland. Water was further diverted to the south along a human-made ditch. Approximately 900 feet south, the ditch meets Plains Road. Seasonal flows within the roadway were causing an on-going maintenance issues. In 2015, the MA Department of Fisheries and Wildlife implemented a project to restore the hydrologic connection between the intermittent stream and the degraded wetland through simple grading. The work has increased soil moisture and is helping to transition the area back to dominant wetland plant communities over time, providing habitat for local wildlife, increasing local groundwater recharge, and eliminating existing roadway flooding and maintenance issues.

The sandy, well-drained, nutrient-poor soils of the Montague Plains are typical of Pitch Pine-Scrub Oak ecosystems across the northeastern United States. These are the extremely sandy deposits of the Montague Delta. Ecological studies of vegetation on the Plains have demonstrated that vegetation differs based on how soils were used in the past: Pitch pine is more common on tracts of the Plains that were cultivated for agriculture in the nineteenth or twentieth century, while scrub oak is more common on tracts that were never plowed (Motzkin et al., 1996). Plant diversity is higher on unplowed sections, and these areas are believed to provide important habitat for rare species of moths and butterflies (Motzkin et al., 1996, and Glenn Motzkin, personal communication). Some of these unplowed sections of the Plains are part of the protected Montague Plains Wildlife Management Area, while others are owned by FirstLight Power and are zoned and planned for future industrial use.

In other areas of town, there is a good correlation between soils that support wildlife habitat and soils that present the most constraints to development. These soils include shallow and sandy Scarboro, Whitman, Limerick, and Walpole soils found in depressions and saddles in the hills and the areas bordering the streams in the valleys primarily in the southwestern quadrant of Montague. These soils have high water tables during all or most of the year, and likely support habitat for a diverse array of species.

There is a relationship between soils and current and future drinking water supplies. Soils that have high filtration rates generally provide high recharge to aquifers. In Montague, these soils are located in the central (Montague Plains), northwestern, and southwestern areas of the town and coincide with a low-yield aquifer. A high-yield aquifer is also located within the central section of the town (see the Water Resources map). These easy-to-develop soils provide little filtration of septic leachate, as water passes through very quickly. Development could pollute the groundwater in these areas if care is not taken to protect the aquifer.

Prime Farmland Soils

The Natural Resources Conservation Service (NRCS) 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.

Designated farmland soils are comprised of three classes of soils that have been identified by the NRCS:

- Prime Farmland
- Unique Farmland, and
- Farmland of statewide or local importance.

These soil classes have been identified as contributing to the agricultural productivity of the country and should be protected from conversion to non-agricultural uses. 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. 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, with such crops defined by the Secretary of Agriculture. Farmland of statewide or local importance is defined as “farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops.” These agricultural soils are a finite resource. If the soil is removed, or the land is converted to another use, the capacity for food and fiber production is lost.

Prime farmland soils have contributed to the Town’s economic stability throughout its history. Approximately 2,557 acres of prime farmland soils are located within Montague, consisting of roughly 13% of the Town’s area. These prime farmland soils are primarily located in the southwestern section of the town along the Connecticut River as far west as Greenfield Road; in the Sawmill River and Goddard Brook floodplains; and along Route 63. Another pocket of prime farmland also exists to the east of West Mineral Road in Millers Falls (see the Soils and Geographic Features map). The characteristics that make prime farmland soils suitable for agricultural use also make them easy to develop. Large tracts of level, well-drained farmland are attractive to developers because the cost of installing roads and other infrastructure is relatively low. In Montague, there is a large amount of farmland with frontage on existing roads, making it vulnerable to approval not required (ANR) development.



An effective way of conserving farmland is to prioritize the parcels of those landowners that want their land protected. The Agricultural Preservation Restriction (APR) Program is a voluntary program that provides a non-development alternative to farmers and other owners of "prime" and "state important" agricultural land. The program offers to pay farmland owners the difference between the "fair market value" and the "agricultural value" of their farmland in exchange for a permanent deed restriction, which restricts any use of the property that will have a negative impact on its agricultural viability.¹ The APR program requires a local match for the program that can come from any combination of three sources: the municipality, a non-governmental organization such as a land trust, and from a bargain sale conducted by the landowner. The local match requirement is 20 percent, however this percent is reduced if the town has implemented certain policies, including establishing an Agricultural Commission and adopting a Right-to-Farm bylaw.

Montague has an Agricultural Commission, a Right-to-Farm bylaw in place, Right-to-Farm signage, and a Conservation Fund to help support APR projects in town. Agricultural Commissions advocate for farmers, farm businesses, and farm interests in town, and can help work with other boards and committees on farm related issues or concerns. A Right-to-Farm bylaw encourages the pursuit of agriculture, promotes agriculture-based economic opportunities, and protects farmlands within a town by allowing agricultural uses and related activities to function with minimal conflict with abutters and town agencies.²

With the issues of global warming and the need for energy conservation, farmland protection becomes more vital. Locally grown and harvested products allow communities to be more self-sufficient and to help contribute to the reduction of pollution and use of fossil fuels. Protecting farmland for agricultural use has larger implications beyond the town level for the region's food supply. Protecting farmland and local food supplies was identified as the top natural resource goal through the public participation process for the 2013 *Sustainable Franklin County: Franklin County's Regional Plan for Sustainable Development (RPSD)*. To examine whether Franklin County has the land resources needed to support an increasing demand for local food—and to achieve some level of food self-reliance—the Conway School of Landscape Design (CSLD) was hired to undertake an analysis of Franklin County's farmland for the RPSD.

The study found that the Connecticut River Valley contains more cropland, roughly 12,150 acres, than West and East County combined, and also contains the most prime farmland soils in the county. The study finds that in order for the County to achieve food self-reliance, an additional 3,880 acres of pasture and 13 acres of orchard would need to be put into production (see Table 4-2 below). Currently the County has adequate cropland for self-reliance; however it

¹ Massachusetts Agricultural Preservation Restriction Program: <http://www.mass.gov/eea/agencies/agr/land-use/agricultural-preservation-restriction-program-apr.html>.

² Massachusetts Executive Office of Energy and Environmental Affairs: <http://www.mass.gov/eea/agencies/agr/land-use/right-to-farm-by-law.html>.

is important to note that many farms produce crops for local markets as well as markets outside of the County.

Table 4-2: Franklin County Farmland Needed for Self Reliance

Farmland Type Needed	Existing Farmland Acreage	Farmland Acreage Needed	Balance
Cropland	23,750	16,547	+7,203
Pasture	12,320	16,200	-3,880
Orchard	1,180	1,193	-13
TOTAL	37,250	33,940	+3,310

Source: *Franklin County Farmland and Foodshed Study*, Conway School of Landscape Design, 2012. As presented in the 2013 *Sustainable Franklin County: Franklin County's Regional Plan for Sustainable Development's* Natural Resources Chapter.

Agricultural trends in Franklin County between 2002 and 2012 show a steady increase in the number of farms and the amount of land in farms in the County, which is contrary to national trends. At the same time the size of farms is decreasing. Additionally, the number of farms where farming is the primary occupation of the principal operator has increased in Franklin County since 2002.³ All of these trends seem to suggest that farming is a growing economic sector in the County, where small farms operated as the owner's primary business are increasing. As a follow up to the *Farmland and Foodshed Study*, in 2015 the Franklin Regional Council of Governments (FRCOG) published the *Franklin County Farm and Food System Project* report. Results of a survey of farmers showed a need for access to more farmland, and that farmland is currently too expensive. In Montague, farmers specifically called out a need for more cropland. The survey also indicated a need for assistance with farm transition planning, with nearly 70% of responding farmers 64 years and younger indicating they do not have a transition plan in place for their farm when they retire.

In 2012 the Mount Grace Land Conservation Trust partnered with the owners of Red Fire Farm to launch the Campaign for Affordable Farms. Based on a whole farm affordability model, the campaign raised money for the land trust to purchase 122 acres of forest and farmland at the farm's Montague location. Under the shared-ownership model, the land trust will own the land as a community resource, while the farmers own the farmhouse and other buildings on the property. The land trust will lease the land to the current farmers and future farmers at a reasonable rate that supports the financial viability of farming the land. In addition, resale of the buildings is restricted to an affordable price. In this way, the entire farm, including land, farm buildings, and housing, is preserved as affordable. Moving forward, the land trust hopes that this model will be used by other farms in the region to help keep whole farms affordable for future generations.⁴

³ U.S. Census of Agriculture, 2002, 2007, and 2012. <http://www.agcensus.usda.gov/>

⁴ Mount Grace Land Conservation Trust website: <http://www.mountgrace.org/campaign-affordable-farms-reaches-400000-goal>. Accessed December 30, 2016,

B. LANDSCAPE CHARACTER

The Town of Montague has a diverse landscape that distinguishes it from surrounding communities. The Connecticut River defines the western border of the town, and the farm fields and farmhouses along the river give the town its rural, agricultural character. The hilly, forested landscape east of Route 63 is still very sparsely populated. Walk a few hundred feet from the road in this section of town and it is easy to become lost in the forest. Surprisingly, this area is only five miles from the densely populated urban center of Turners Falls. Turners Falls and Millers Falls resemble other nineteenth century mill towns, while Montague Center is a typical nineteenth century rural village. The sights, sounds and fragrances of the Montague Plains resemble the pine barrens of the Cape and Islands more than any other landscape in the western region of the state, and the village of Lake Pleasant on the edge of the Montague Plains, with its tightly clustered Victorian homes, is reminiscent of a freshwater Oak Bluffs.

B.1 Potential Changes in Development

The overall character of Montague could be affected by a number of potential changes. Rising sea levels from climate change could begin to push coastal populations along the eastern seaboard inland, and more of Montague's land could be used for residential development. Diminishing supplies of fossil fuels—and their rising costs and contribution to global warming—continue to cause people to turn to alternate sources of locally produced energy sources, such as wood and solar, which could impact Montague's woodlands and open spaces. Costs of shipping foods long distances could cause an even greater demand for locally grown and processed food, potentially placing a greater demand on farmland in Montague. Land that is currently forested and that contains Prime Farmland soils could be converted to farmland. Flooding and erosion from an increase in the intensity of storms and rainfall may further limit the availability of land for new development. While challenging, with thoughtful planning, these potential changes in development could be integrated into Montague's existing character, and could lead to greater energy independence and food security.

C. WATER RESOURCES

C.1 Watersheds

Montague 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 located in the watersheds of two major rivers: the Connecticut River and the Millers River. Most of Montague lies in the Connecticut River Watershed. The Sawmill River in Montague is an important sub-watershed within the Connecticut River Watershed.

The Connecticut River watershed is the largest river ecosystem in New England. It encompasses approximately 11,000 square miles and flows from its headwaters of Fourth

Connecticut Lake in New Hampshire at the Canadian border to Long Island Sound at Old Lyme, Connecticut. The River travels through Massachusetts entering the Commonwealth at Northfield, draining all or part of forty-five (45) municipalities before entering the State of Connecticut. The watershed is 80 percent forested, 12 percent agricultural, 3 percent developed and 5 percent wetlands and water.

The Connecticut River watershed is home to many species including nine federally listed endangered, threatened, or candidate species. These include the piping plover, shortnose sturgeon, dwarf wedge mussel, puritan tiger beetle, Jesup's milk-vetch, Robbin's cinquefoil, small whorled pogonia, and the northeastern bullrush. (The bald eagle (2007) and the peregrine falcon (1999), have been de-listed due to recovery of the species.)⁵

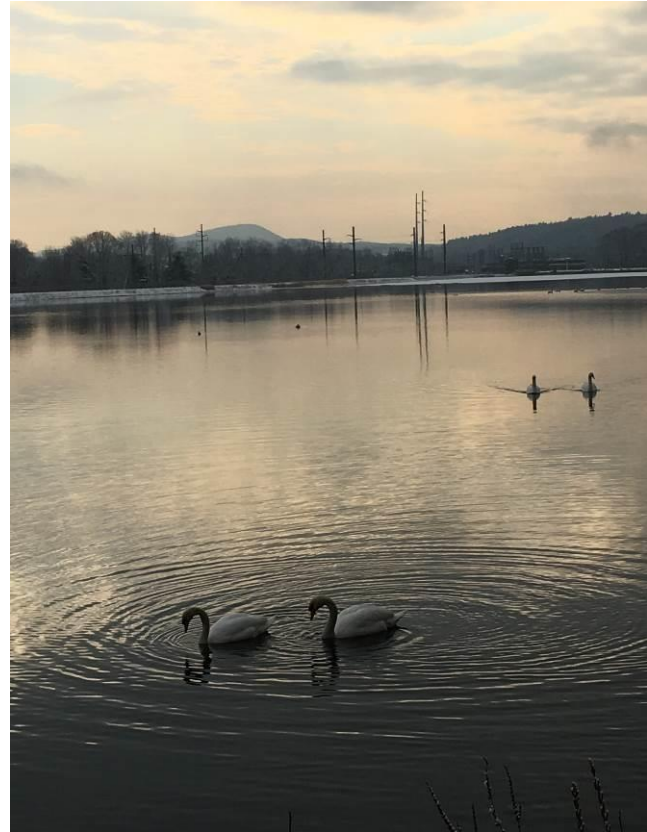


Photo credit: Linda Hickman

The Millers River is one of the Connecticut River's 38 major tributaries and a large river of statewide importance and historical significance in Massachusetts. Its headwaters are located in southern New Hampshire and the Massachusetts towns of Ashburnham and Winchendon. Montague is located in the western portion of the Millers River Watershed, which includes portions of sixteen Massachusetts communities and four towns in New Hampshire.

This section focuses on waters within the Town of Montague, though it is important to keep in mind that improvements in water quality in the Millers River, Sawmill River, and other brooks and streams in town have impacts beyond town borders.

C.2 Surface Waters

C.2.1 Connecticut River

The Connecticut River has great significance for the Town of Montague. The falls served as a gathering place for Native Americans who fished in the river for thousands of years prior to European settlement. In the late 1700s, the canal and dam were built to allow boats to navigate around the falls, and later were repurposed to power industrial mills. Today, the river

⁵ U.S. Fish and Wildlife Service, Silvio O. Conte National Fish and Wildlife Refuge website, https://www.fws.gov/refuge/Silvio_O_Conte/wildlife_and_habitat/endangered.html, accessed December 27, 2016.

continues to provide hydropower, and serves as a scenic and dramatic backdrop to the town. Recreational use of the river has diminished over time due to safety concerns and a lack of formal access points in Montague. The relicensing process of the hydroelectric facilities offers an opportunity to reestablish connections to the river, as well as improve the health of the river ecosystem for fish and other wildlife.

The Connecticut River and its watershed are nationally significant. In 1991, Congress established the Silvio O. Conte National Fish and Wildlife Refuge, the only refuge in the country to encompass an entire watershed – the Connecticut River watershed in four states. Seven years later, in 1998, the Connecticut River became one of only fourteen rivers in the country to earn Presidential designation as an American Heritage River. In May 2012, the U.S. Interior Secretary designated the Connecticut River as America's first National Blueway, saying the restoration and preservation efforts on the river were a model for other American rivers.⁶

The priorities of the Massachusetts Executive Office of Energy and Environmental Affairs for the Connecticut River watershed include: promote the protection and/or creation of riparian buffer zones along its waterways; reduce the negative effects of non-point source pollution, primarily stormwater runoff; restore aquatic diversity by removing barriers to fish and eel passage on the tributaries to the Connecticut; and improve upon the limited amount of water quality data available within the Watershed.⁷

The Connecticut River Five-Year Watershed Action Plan, completed in 2003, identifies and addresses five priority issues within the watershed: riparian corridors, water quality and non-point source pollution, water quantity, wildlife habitat and fish passage, and public access and recreation. Montague falls within the Northern Reach of the river. Priorities for the Northern Reach focus on the protection of the existing natural resources and the mitigation of the effects of the hydroelectric power projects on the mainstem of the Connecticut River, as well as the reduction of bacteria and nutrient levels in the river resulting from runoff generated by agricultural and other sources. Specific strategies include riparian corridor education, outreach and restoration projects, increased water quality monitoring, improved stormwater management practices, reducing run-off from gravel and dirt roads, and expanding education on the importance of removing barriers to fish passage and wildlife movement in and along river and stream corridors.⁸

The Connecticut River has a “Class B” water quality designation in Franklin County and is classified as a warm water fishery. Class B waters are supposed to provide suitable habitat for

⁶ <http://connecticutriver.us/site/content/about-river>.

⁷ Massachusetts Executive Office of Energy and Environmental Affairs website, <http://www.mass.gov/eea/waste-mgmt-recycling/water-resources/preserving-water-resources/mass-watersheds/connecticut-river-watershed.html>, accessed December 27, 2016.

⁸ *Connecticut River Five-Year Watershed Action Plan for the Massachusetts Section of the Watershed, 2002-2007*. Prepared for the Massachusetts Executive Office of Environmental Affairs by the Department of Landscape Architecture and Regional Planning, UMass Amherst. May 2003. <http://www.mass.gov/eea/docs/eea/water/wap-connecticut-2003.pdf>.

fish and other wildlife, and to support “primary contact” recreational activities such as fishing and swimming and aesthetics. The water should also be suitable for irrigation and other agricultural uses. According to the 2014 Massachusetts Department of Environmental Protection’s (DEP) Integrated List of Waters, the Connecticut River in Montague is impaired by polychlorinated biphenyls (PCBs) found in fish tissue, Total Suspended Solids (TSS), and impacts to fish and aquatic wildlife from fluctuations in water levels and flow from the hydroelectric operations.⁹

The Connecticut River is one of the water bodies in the state which requires TMDLs. A TMDL, or a Total Maximum Daily Load, is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL report prepared for each impaired water body describes the steps and technologies needed to reduce the pollutant or source of impairment to meet water quality standards. Ultimately the Town of Montague should expect the development of TMDLs for each of its water bodies on the 303(d) list. The TMDL reports reflect DEP’s strategy for cleanup of all of the water bodies in Massachusetts. The only TMDL report completed for the Connecticut River watershed is the Total Maximum Daily Loads of Phosphorous for Selected Connecticut Basin Lakes, published in 2001.

The *Connecticut River Basin 2003 Water Quality Assessment Report* published in 2008 by the Massachusetts DEP presents a summary of water quality data and information in the Connecticut River Watershed by segment.¹⁰ There are several segments within Montague that were assessed. Segments for the Sawmill River and Millers River will be discussed in more detail in the following sections. The Connecticut River from the Route 10 bridge in Northfield to the Turners Falls Dam is contained within the 22-mile Turners Falls Power Pool (Segment MA34-02). Bank erosion, caused by flooding, boat wakes, overland flows, groundwater seepage, and river level fluctuations from operation of the Northfield Mountain Pumped Storage Facility, is a significant problem in this reach of the Connecticut River. Evidence of extreme erosion in this segment of the river prompted the creation of the Connecticut River Streambank Erosion Committee and the development of an Erosion Control Plan, completed in 1999. Since the Erosion Control Plan, FirstLight Power has been required to perform a regular inventory of riverbank conditions, which is published as the Full River Reconnaissance report. Working with the utility, the Connecticut River Streambank Erosion Committee uses this report to prioritize sites for repair. To date, approximately 19,000 linear feet of riverbank have been reconstructed and repaired.

According to the Water Quality Assessment Report, this section of the Connecticut River is assessed as impaired for fish consumption due to the presence of PCBs in fish tissue. The

⁹ 2014 Integrated List of Waters Interactive Map: <http://maps.massgis.state.ma.us/images/dep/omv/il2014viewer.htm>. Massachusetts Department of Environmental Protection. Accessed December 27, 2016.

¹⁰ Connecticut River Watershed 2003 Water Quality Assessment Report. Prepared by Jamie W. Carr and Laurie E. Kennedy, Massachusetts Department of Environmental Protection, Division of Watershed Management. October 2008. <http://www.mass.gov/eea/docs/dep/water/resources/07v5/34wqar07.pdf>.





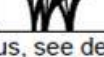
Massachusetts Department of Public Health has issued the following advisory concerning fish consumption for the entire Massachusetts stretch of the Connecticut River:

- Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body.
- The general public should not consume Channel Catfish, White Catfish, American Eel or Yellow Perch from this water body.¹¹

This segment of the river is assessed as supporting aquatic life, however an alert status is identified with this use due to the fluctuations in water levels from the hydropower operations, severe bank erosion issues, the isolated presence of non-native plant species, and the risk that fish tissue contaminants pose to fish-eating wildlife. Primary and secondary contact recreation and aesthetics are supported in this segment of the river, however an alert status is assigned to these uses due to the fluctuation in water levels, turbid conditions, and severe bank erosion issues.

Figure 4-1: Water Quality Assessment for the Connecticut River from Route 10 Bridge in Northfield to the Turners Falls Dam

Connecticut River (Segment MA34-02) Use Summary Table

Designated Uses		Status
Aquatic Life		SUPPORT*
Fish Consumption		IMPAIRED Cause: PCB in fish tissue Source: Unknown
Primary Contact		SUPPORT*
Secondary Contact		SUPPORT*
Aesthetics		SUPPORT*

* Alert Status, see details in use assessment






Source: Connecticut River Basin 2003 Water Quality Assessment Report. Massachusetts Department of Environmental Protection, 2008.

The next segment of the Connecticut River assessed is located between the Turners Falls Dam and the confluence with the Deerfield River (Segment MA34-03). Montague borders this entire 3.6 mile segment. According to the Water Quality Assessment Report, Aquatic life is assessed as impaired for the upper 2.9 mile portion of this segment, where the river is largely diverted to the power canal, leaving this reach of the Connecticut River virtually dry for part of the year. An alert status is also assigned to aquatic life due to the risk that fish tissue contaminants pose to fish-eating wildlife. Fish consumption for this segment of the river has the same impairment

¹¹ Massachusetts Department of Public Health website:
https://eohhs.ehs.state.ma.us/DPH_FishAdvisory/Default.aspx. Accessed December 28, 2016.

due to PCBs. Primary and secondary contact recreation and aesthetics were not assessed. Recommendations for this portion of the river include implementing fish passage improvements at the Turners Falls Dam and collecting the necessary water quality data needed to assess primary and secondary contact recreation. As part of the FERC relicensing process for the Turners Falls hydropower project, the Town and other stakeholders are advocating for an increased minimum flow in the bypass reach of the Connecticut River to support fish passage as well as recreation.

Figure 4-2: Water Quality Assessment for the Connecticut River from Turners Falls Dam to the Confluence with the Deerfield River

Connecticut River (Segment MA34-03) Use Summary Table		
Designated Uses		Status
Aquatic Life		IMPAIRED upper 2.9 miles Cause: Flow alteration Source: Impacts from hydropower flow regime alterations NOT ASSESSED* lower 0.7 miles
Fish Consumption		IMPAIRED Cause: PCB in fish tissue Source: Unknown
Primary Contact		NOT ASSESSED
Secondary Contact		NOT ASSESSED
Aesthetics		NOT ASSESSED






* Alert Status, see details in use assessment

Source: Connecticut River Basin 2003 Water Quality Assessment Report. Massachusetts Department of Environmental Protection, 2008.

Segment MA34-04 consists of the Connecticut River from the confluence with the Deerfield River in Greenfield, Deerfield and Montague, to the Holyoke Dam in Holyoke and South Hadley. Throughout this section there are a number of wastewater treatment plants, including the Montague Pollution Control Facility, that discharge effluent to the river. These plants conduct regular toxicity testing to ensure they are in compliance with permitted limits. For this segment of the Connecticut River, aquatic life is assessed as being supported due to good water quality data, the excellent survival of test organisms exposed to water from this segment, and the general lack of acute toxicity in effluent being discharged by wastewater treatment facilities. An alert status is associated with this segment of the river due to isolated occurrences of *Trapa natans*, a non-native aquatic macrophyte, in this segment, as well as the risk that fish tissue contaminants pose to fish eating wild life. Fish consumption is impaired due to PCBs in fish tissue. Primary and secondary contact recreation and aesthetics are supported in this segment of the river due to acceptable bacteria counts and lack of objectionable conditions.

Figure 4-3: Water Quality Assessment for the Connecticut River from the Confluence with the Deerfield River to the Holyoke Dam

Connecticut River (Segment MA34-04) Use Summary Table

Designated Uses		Status
Aquatic Life		SUPPORT*
Fish Consumption		IMPAIRED Cause: PCB in fish tissue Source: Unknown
Primary Contact		SUPPORT
Secondary Contact		SUPPORT
Aesthetics		SUPPORT

* Alert Status, see details in use assessment

Source: Connecticut River Basin 2003 Water Quality Assessment Report. Massachusetts Department of Environmental Protection, 2008.

In 2007 the Connecticut River Watershed Council (CRWC) launched a volunteer water quality monitoring program at riverside sites from Longmeadow to Gill, MA, and in 2009 the CRWC opened a lab to process bacteria samples from over 45 locations in Massachusetts and Vermont during the boating and swimming season. Results are available on the website <http://connecticutriver.us/>, which provides up-to-date and prior results of *E. coli* bacteria monitoring along the river and some tributaries. The website includes a map with color-coded flags denoting whether the river is clean for swimming and boating, clean for boating only, or not clean for swimming or boating, based on the most recent test results. Testing occurs weekly at the Barton Cove boat ramp on the Gill side of the river near Turners Falls. Results show that this area is usually clean for boating and swimming except after wet weather events, when bacteria levels often rise. In addition, testing has occurred at the confluence of the Millers and Connecticut Rivers in Millers Falls, where testing has also shown that the river is clean for boating and swimming most of the time except after rain events.

C.2.2 Millers River

The Millers River is located in north central Massachusetts and southwestern New Hampshire. From its headwaters, the Millers River flows south, then gradually west, ultimately flowing into the Connecticut River along the northeastern border of the Town of Montague. The Millers River is one of 38 major tributaries to the Connecticut River.

Although the Millers River fluctuates between sluggish and rapid flows, there is an average drop of twenty-two (22) feet per mile. The river and its tributaries powered industrial



development in the region since the late 1700s. Over time, serious water pollution problems resulted from industrial and human uses of the river as a sewer.

Today, the Millers River is valued for its recreational and natural resources. The Millers provides opportunities for fishing, wildlife and scenic viewing, whitewater boating and swimming. Formal public access to the Millers River in Montague is currently limited to Cabot Camp, a

popular and scenic area at the river's confluence with the Connecticut River. The Town is currently working on developing a second formal river access area in Millers Falls on Bridge Street. The river supports a variety of species including freshwater mussels. Freshwater mussels are particularly good indicators of water quality and therefore their presence may indicate improving conditions along the Millers River.

The Millers River has an appallingly colorful history of industrial pollution—literally. In the late 1950s, paper mills in the towns of Erving and Baldwinville switched from using virgin white pulp as a primary raw material to using recycled paper. The recycled paper's chemical coatings and colored inks had to be removed in order to make new paper. As there were no wastewater treatment plants at the paper factories, these inks and coatings went directly into the river as waste from the water-intensive paper making process. The volume of chemical discharges increased as paper production expanded, causing the river to flow in different colors (Showers, 2000).

During the late 1960s, citizen activists began meeting to discuss strategies to clean up the river. Montague farmer Henry Waidlich was one of the founding members of the Millers River Watershed Council (MRWC),¹² a nonprofit organization founded in 1970 to address industrial pollution in the watershed (Showers, 2000).

Regulation of industrial discharges under the Clean Water Act beginning in the early 1970s and advocacy by the MRWC resulted in substantial improvements in water quality in the Millers River. In 1983, the Millers River was stocked with fish for the first time in 20 years. Along with the regular sport fish, 20,000 juvenile salmon were released as part of the salmon restoration program. The Millers River no longer smelled or looked dirty, but fishing was on a catch-and-release basis only (Showers, 2000).

Although the river is considered Class "B" (appropriate for fishing and swimming), consumption of fish caught in the river is not advisable. The Massachusetts Department of

¹² <https://millerswatershed.org/>

Public Health has issued the following fish consumption advisory for the Millers River, from the confluence with the Otter River in Winchendon to the confluence with the Connecticut River in Montague, due to PCBs found in fish tissue:

- Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body.
- The general public should not consume Brown Trout or American Eel from this water body.
- The general public should limit consumption of non-affected fish from this water body to two meals per month.¹³

According to the Executive Office of Energy and Environmental Affairs (EOEEA), the top watershed priorities for the Millers River are: continue efforts to preserve open space and promote sustainable growth management by conducting a watershed-wide Regional Open Space Plan, as well as developing a Land Management Plan for a section of the Tully River; complete the ongoing hydrologic assessment study to determine hydrologic impacts and implement actions that have been recommended; continue to work to improve water quality by implementing a Nonpoint Source Education campaign and by continuing water quality monitoring through DEP's Strategic Monitoring & Assessment for River Basin Teams (SMART) Monitoring Program; and, support continuing efforts to solve and mitigate PCB contamination in the Millers and Otter Rivers.¹⁴

The continued presence of dangerous levels of PCBs buried in sediments and in fish has prevented the Millers from achieving its classification as "swimmable and fishable." During the summer and fall of 1999, the U.S. Geological Survey measured polychlorinated biphenyl (PCB) concentrations in passive samplers deployed in the Millers River Basin in Massachusetts. The observed PCB concentrations indicated a historical release of PCBs likely occurred on the Otter River at the upstream margin of Baldwinville, Massachusetts. PCB concentrations decreased significantly downstream of the confluence of the Otter River with the Millers River because of dilution of Otter River water with mostly uncontaminated water from the Millers River and volatilization of PCBs in steep reaches of the Millers River. The PCB load in the Millers River was relatively small compared with PCB loads in other PCB-contaminated rivers in the Northeast. The likely source of PCBs in the Millers River Basin is the remobilization of PCBs associated with stream sediments. PCBs deposited on the sediment likely originated from an upstream source. Estimated concentrations of PCBs in water throughout the main stems of the Millers and Otter Rivers exceeded the U.S. Environmental Protection Agency's water-quality criterion, which is based on the cancer risk associated with eating fish taken from the water. PCB concentrations detected in indicator fish (white suckers;






¹³ Massachusetts Department of Public Health website: https://eohhs.ehs.state.ma.us/DPH_FishAdvisory/Default.aspx. Accessed December 28, 2016.

¹⁴ MA EOEEA website: <http://www.mass.gov/eea/waste-mgmt-recycling/water-resources/preserving-water-resources/mass-watersheds/millers-river-watershed.html>. Accessed December 28, 2016.

Catostomus commersoni) sampled in 2000 were a quarter of concentrations detected in the same species sampled in 1985-88.¹⁵

The *Millers River Watershed 2000 Water Quality Assessment Report*, published in 2004 by the Massachusetts DEP, presents a summary of water quality data and information in the Connecticut River Watershed by segment.¹⁶ Montague falls within the 9.2 mile segment between the Erving Center Wastewater Treatment Plant and the confluence with the Connecticut River. According to the report, aquatic life is supported in this segment with an alert status, however, due to flow fluctuations twice per day (potentially associated with hydropower projects on the river), potential PCB contamination from upstream, and slightly elevated levels of total phosphorous in the Erving Center WWTP effluent discharge. Fish consumption is assessed as impaired due to mercury and PCBs, though the MA DPH has since updated the fish consumption advisory identifying PCBs as the only impairment. Aesthetic uses were assessed as supported in this segment, however an alert status is associated with this use because of the Mormom Hollow Demolition Landfill in Wendell, which experienced slope failure in 2000 but has been stabilized. Primary and secondary contact recreation uses were not assessed due to lack of data.

Figure 4-4: Water Quality Assessment for the Millers River from the Erving Center WWTP to the Confluence with the Connecticut River

Millers River (MA35-05) Use Summary Table	
Designated Uses	Status
Aquatic Life 	SUPPORT*
Fish Consumption 	IMPAIRED Causes: Mercury and PCB Sources: Unknown for mercury, contaminated sediment, releases from waste sites or dumps (Suspected Source: Atmospheric deposition)
Primary Contact 	NOT ASSESSED
Secondary Contact 	NOT ASSESSED
Aesthetics 	SUPPORT*

* "Alert Status" issues identified, see details in the use assessment section

Source: Millers River Watershed 2000 Water Quality Assessment Report. Massachusetts Department of Environmental Protection, 2004.

¹⁵ *Source Identification and Fish Exposure for Polychlorinated Biphenyls Using Congener Analysis from Passive Water Samplers in the Millers River Basin, Massachusetts*. Colman, John A. U.S. Department of the Interior, U.S. Geological Survey. 2001. <https://pubs.usgs.gov/wri/wri004250/html/pdf.html>

¹⁶ *Millers River Watershed 2000 Water Quality Assessment Report*. Prepared by Laurie E. Kennedy and Alice M. Rojko, Massachusetts Department of Environmental Protection, Division of Watershed Management. March 2004. <http://www.mass.gov/eea/docs/dep/water/resources/07v5/35wqar.pdf>.

The *Millers River 5-Year Watershed Action Plan 2005-2009*¹⁷ lists the following priority goals and objectives for the watershed:

Goal: To Support Environmentally Sustainable Growth in the Watershed

Objective: Increase the capacity of local officials to proactively manage growth in their communities and encourage environmentally sustainable growth.

Objective: Support the implementation of Brownfields and other redevelopment projects that re-use existing structures and direct uses away from undeveloped land (“greenfields”)

Goal: To Restore and Improve Natural Flow Regimes and Aquatic Habitat

Objective: Manage river flow conditions to more closely resemble natural flow regimes

Objective: Promote the restoration and enhancement of stream continuity and fish passage along the mainstem and within the tributaries of the Millers River

Objective: Control the infestation and spread of invasive aquatic plant species within the watershed

Goal: To Protect and Improve Water Quality in the Watershed;

Objective: Identify and minimize sources of pollution in the watershed

Goal: To Preserve and Restore Biodiversity and Wildlife Habitat

Objective: Enhance and restore riparian habitat

Objective: Work to preserve lands of conservation and wildlife interest at a “watershed-scale”

Objective: Promote the enhancement and creation of wildlife corridors

Objective: Enhance terrestrial habitat biodiversity and promote appropriate forest and land management practices

Objective: Protect potential vernal pool locations and other wetland resource areas in the watershed.

Objective: Control the infestation and spread of invasive terrestrial plant species

Goal: To Expand Public Outreach and Educational Activities in the Watershed

Objective: Foster a greater sense of watershed stewardship and increase awareness of watershed resources

Objective: Strengthen and expand the volunteer monitoring network in the watershed.

Goal: To Strengthen Grassroots Support for the Watershed

Objective: Expand resident involvement in watershed advocacy activities

Objective: Increase outreach to area legislators to stress the urgency of addressing watershed issues

¹⁷ *Millers River 5-Year Watershed Action Plan 2005-2009*. Prepared by the Millers River Watershed Advisory Committee with assistance from the Franklin Regional Council of Governments and the Millers River Environmental Center. September 2004. <http://www.mass.gov/eea/docs/eea/water/wap-millers-2004.pdf>.

Objective: Increase the capacity of the Millers River Environmental Center to play a proactive role in watershed planning.

Goal: To Promote, Protect and Enhance the Open Space and Recreational Value of the Millers River Watershed.

Objective: Promote, protect and enhance the recreational value of the Millers River and its main tributaries

Objective: Promote, protect and enhance the trail networks and greenways in the watershed

Objective: Support efforts of watershed towns to implement recommendations of local Open Space & Recreation Plans, including protecting locally significant open space parcels.

To address the lack of water quality data in the Millers River, the Millers River Watershed Council (MRWC) has been conducting bacteria monitoring since 2011 to assess the appropriateness of water-based recreation in the river using Mass DEP guidelines. One of the sampling sites is located at the confluence of the Millers and Connecticut Rivers in Montague and Erving. Results from the 2014 sampling season indicated that the Millers River has water quality conditions well suited for primary and secondary contact recreation. The data showed that immediately following a rain storm, river areas in and immediately below urban areas may not be suitable for primary contact, but secondary contact may be acceptable. In dry weather conditions, the river appears acceptable for primary and secondary contact recreation. The MRWC notes that communities wishing to improve contact standards should consider implementing (and maintaining) a comprehensive stormwater management program to help address non-point source pollution, a common cause of elevated bacteria after wet weather events.¹⁸

Stormwater runoff is a major cause of water pollution in the Millers River and other water bodies in Massachusetts. As stormwater flows over impervious surfaces (roads, buildings, parking lots etc.), it collects animal waste, litter, salt, pesticides, fertilizers, oil & grease, soil, and other potential pollutants before it flows into storm drains that empty into the Millers River. In 2014, the Franklin Regional Council of Governments (FRCOG) was awarded an s.319 Nonpoint Source Pollution grant from MA DEP to work with Millers River watershed towns in Franklin County to identify ways to reduce pollution from stormwater runoff and protect sensitive watershed areas. The effort focused on Low Impact Development (LID) stormwater management techniques. LID treats stormwater as a resource rather than a waste product. LID techniques preserve and recreate natural landscape features at a development site, using rain gardens, vegetated rooftops, rain barrels and permeable pavements to treat runoff and return it to the ground or a stormwater collection system. A series of three workshops and a field trip provided town officials and residents with an understanding of LID techniques. In Montague,

¹⁸ MRWC Bacteria Monitoring Program 2014 Report: Millers and Otters Rivers. Millers River Watershed Coalition, January 2015. <https://millersriverwatershed.files.wordpress.com/2015/04/mrwc-2014-bac-t-report-final.pdf>

FRCOG staff worked with the Town to develop stormwater management performance standards for the proposed Turnpike Road Industrial Park.

According to the 2014 MA DEP Integrated List of Waters, the Millers River in Montague is impaired due to PCBs in fish tissues, and requires a TMDL, or a Total Maximum Daily Load. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL report reflects DEP's strategy for cleanup of all of the water bodies in

Massachusetts. Only one TMDL report exists for water bodies in the Millers River watershed, the *Total Maximum Daily Loads of Phosphorous for Selected Lakes in the Millers Basin Lakes*, which was published in 2003. This report only focuses on lakes in communities in the watershed that are east of Montague.



An example of Low Impact Development (LID) stormwater management at Unity Park. A rain garden treats stormwater runoff from the parking area and the playground water feature.

C.2.3 Sawmill River

The Sawmill River is a sub-watershed of the Connecticut River Watershed that drains approximately thirty-two square miles of land located in the towns of Montague, Wendell, Leverett and Shutesbury. From its headwaters at Lake Wyola in Shutesbury, the Sawmill River flows westerly for approximately fourteen miles to its confluence with the Connecticut River in the Town of Montague. The upper reaches of the watershed are forested and steep, accounting for approximately 85 percent of the total watershed area. The valley in the upper watershed is narrow, with the floodplain limited in most locations. Housing density in this section is low, with most homes located adjacent to North Leverett Road, close to the river. Downstream from Route 63, the watershed characteristics change. The topography flattens and the floodplain widens. The land use is a mixture of cropland, pasture, forest and other open land. Development is generally scattered, with the exception of the densely-populated village of Montague Center.

As its name implies, the Sawmill River was harnessed for power by early settlers in Montague. Beginning in the eighteenth century, the river was dammed to provide power to many mills along its length. Most of the mills are gone, but several dams remain, serving no commercial function but restricting passage of migratory fish. In the lower reaches of the watershed, the

floodplain of the Sawmill has been farmed for centuries. The river closely parallels North Leverett Road and Main Street, and passes under North Leverett Road, Route 63, South Street, Center Street, Main Street, Meadow Road and South Ferry Road on its way to the Connecticut, with bridge abutments located in the floodplain. There are more than a dozen homes and businesses located in the riparian zone within two hundred feet of the river.

Economic use of the Sawmill River and the proximity of buildings and infrastructure to its banks and floodplain has resulted in conflict in the lower watershed as the course of the river has threatened public and private property over the past century. The Town of Montague sponsored dredging attempts to increase flow capacity under bridges during the second half of the twentieth century. Spoil piles were left on the banks. These have acted as dikes, containing higher flows rather than allowing the river to flow across its floodplain. Additional spoil piles from dredging were left along the channel in North Leverett downstream of the Sawmill Dam, and downstream of Route 63 on the north side of the river.

Dredging and the accumulated spoil piles in the floodplain caused the water to travel faster and cut deeper than it would have if allowed to enter the floodplain. Sand, gravel and cobbles moved down-river and collected under bridges filling in the previously dredged areas. Where the river was again able to access its floodplain, it flooded agricultural fields and town roads. Riprap was placed to deflect flows from these areas. These hardened banks forced the flow to the opposite bank, where erosion began anew. Each time the town and its residents attempted to fix one problem, others emerged. Older residents of the town have stories about various projects to alter the course or flows of the river, and about how these efforts have affected fisheries and habitat.

Following the severe storm of June 1996, the town requested help from the Natural Resources Conservation Service (NRCS) in rebuilding infrastructure destroyed by flooding. In 2001, the town again contacted NRCS for assistance repairing a severely eroded section of the bank of the Sawmill River on Meadow Road. During the process of obtaining permits for this work, which cumulatively totaled more than \$500,000, it became clear that state, federal and local environmental permitting authorities were concerned about the piecemeal approach to solving problems in the watershed. Town officials began working with NRCS and the Franklin Conservation District to research the problem. A preliminary assessment was released by the Conservation District in early 2002.

According to the assessment of the Sawmill River included in the *Connecticut River Basin, 2003 Water Quality Assessment Report*, the most significant environmental issue in the watershed is the erosion of the stream banks with subsequent sedimentation, resulting in habitat destruction, flooding and bridge and roadway maintenance problems. In 2006, Vanasse Hanagen Brustlin Inc. (VHB) outlined areas of excessive sediment deposition, bank erosion, and inadequate riparian buffer in the lower portion of the segment of the Sawmill River from Dudleyville Road in Leverett to the confluence with the Connecticut River in Montague. Also of concern is the degradation of fish habitat along the river. Sedimentation can negatively impact the spawning

habitat in the streambed. The erosion along the stream banks removes overhanging vegetative cover and increases water temperature, which also affects habitat. In addition, dredging has resulted in widening of the stream channel, reducing the depth of the streambed, thereby increasing water temperature. The removal of trees to create pastureland and the grazing of livestock along the banks of the river has had a negative impact on the aquatic life in the Sawmill River.

The typical land cover along riparian corridors is composed of mature trees, however, there are stream segments along the Sawmill River where this forested buffer is absent and is replaced by impervious surfaces, riprap, or mowed grass. Invasive species are also present and in some places have successfully taken over the understory. The decline in plant diversity has a negative impact on wildlife habitat.

In July 2002, the Town hosted a meeting of key stakeholders to discuss the findings of the preliminary assessment. Attendees included town officials, NRCS personnel, representatives of the Franklin Conservation District, Franklin Regional Council of Governments, Connecticut River Watershed Council, Trout Unlimited, Massachusetts Executive Office of Environmental Affairs and the office of State Representative Stephen Kulik, and regulatory staff from the Massachusetts Department of Environmental Protection, the Massachusetts Division of Fisheries, Wildlife and Environmental Law Enforcement, United States Fish & Wildlife Service, and the United States Army Corps of Engineers. The participation of so many high-level agency personnel was a good indication of concern about the problem, and interest in the report.

Attendees agreed on the need for more study of the river and on the concept of a comprehensive restoration plan. A working group was formed to involve stakeholders and the public in plans for further study and restoration. In December 2002, the working group proposed the Sawmill River Watershed Restoration Project, with three distinct but interrelated elements: 1) a study resulting in conceptual designs; 2) public education and participation; and, 3) regulatory involvement. NRCS made a major commitment of time and personnel to conduct further research in the watershed beginning in summer 2003. In April 2003, the Franklin Conservation District was awarded one of only four federal 604(b) grants in the state to support additional research, which resulted in the 2006 VHB report cited earlier. Additional funding was obtained under the DEP s.319 nonpoint source pollution grant program to implement the recommendations of that report in regard to remediation of bank erosion and excessive sedimentation.

In 2012 the Franklin Conservation District with support from the Montague Conservation Commission implemented a restoration project involving a 1,700 foot reach of the river from the Route 63 Bridge to Main Street. This stretch had been channelized, resulting in areas of excessive sediment deposition, bank erosion and degraded fisheries and wildlife habitat. Additionally, the disturbed areas along the river had become infested with invasive plant species including, primarily Japanese knotweed (*Polygonum cuspidatum*). A suite of restoration techniques, developed through the use of natural channel design principles, were

incorporated, including rock cross vanes, root wads and log vanes. While the project was smaller in scale than the initial conceptual design developed in the 2006 Sawmill River Restoration Plan, it is anticipated to reduce sediment transport and improve aquatic habitat, channel stability and floodplain sediment storage by restoring natural channel diversity to the river and by reconnecting the river to its natural floodplain. The project was also intended to be a demonstration project to show the effectiveness of in-channel techniques and the use of the Vermont Stream Geomorphic Assessment Protocols. The project's success coupled with future restoration efforts is anticipated to produce positive cumulative effects throughout the entire riverine system.¹⁹

The Town has an important role to play in the restoration of the Sawmill River. While human impact in the lower reaches of the watershed is serious, the upper watershed is mostly forested, and the river continues to serve many valuable ecological functions. The river is classified as a cold water fish resource. Given the opportunity, Atlantic salmon could spawn and salmon fry may grow in the river (see the Fisheries and Wildlife section for information on Atlantic salmon). Trout thrive in the Sawmill year-round, offering living proof that the quality of the water is still clean enough for even the most particular cold water fish. Protecting the riparian corridor and controlling development in the upper reaches of the Sawmill and its tributaries will help sustain fisheries, preserve wildlife habitat, improve water quality and prevent costly damage to public infrastructure and private property from flooding in the future.

C.2.4 Other Rivers and Brooks

Following is a description of other surface waters in Montague. Many of these are classified as cold water fish resources (CFRs) by the Massachusetts Division of Fisheries and Wildlife (MassWildlife). According to MassWildlife, cold water fish resources are particularly sensitive habitats. Changes in land and water use can reduce the ability of these waters to support trout and other kinds of cold water fish. Identification of CFRs are based on fish samples collected annually by staff biologists and technicians. MassWildlife updates the list of CFRs in the state on an annual basis and maintains an interactive map online. Conservation commissions, planning boards, land trusts, regional planning agencies, and town open space committees can refer to the list and map of CFRs to better inform conservation planning.²⁰

Randall Brook

Randall Brook originates near the former town landfill between Turnpike Road and Greenfield Road and flows southwest to the Connecticut River, and is classified as a cold water fishery. The Town, as part of its ongoing landfill obligations, conducts annual monitoring of leachates from the landfill into Randall Brook, which are below reportable levels. In 2016 when the Town and Mass DOT rehabilitated Greenfield Road, a culvert was replaced.

¹⁹ This paragraph excerpted and modified from *Attachment A: Notice of Intent Narrative* prepared by Vanasse Hangen Brustlin, Inc. for the Sawmill River Restoration Project.

²⁰ Massachusetts Division of Fisheries and Wildlife website: <http://www.mass.gov/eea/agencies/dfg/dfw/wildlife-habitat-conservation/coldwater-fish-resources-map.html>. Accessed December 30, 2016.

Hatchery Brook

Hatchery Brook flows westerly from its origin at underground springs on the Montague Plains to the Bitzer State Fish Hatchery on Montague Road. The flow of approximately 1,000 gallons a minute of very clean groundwater is used at the hatchery to raise trout for stocking. From the hatchery, the brook flows southerly under Greenfield Road and South Ferry Road. The brook is dammed to form two small ponds at the historic Field Farm west of South Ferry Road. Downstream of the dams, the brook flows westerly into the Connecticut River.

Pond Brook

Pond Brook originates at the southern end of Lake Pleasant and flows southwesterly. North of Swamp Road, the brook is dammed, creating a body of water known as Clapp's pond. Due to its source at Lake Pleasant, the water entering the pond is very clean. The Town of Montague considered acquisition of this property for a public swimming area when it was for sale during the early 1990s. There was public support for the acquisition, but it was judged to be too expensive. The property on which the pond is located is currently privately owned. South of the pond, the brook joins Goddard Brook in an extensive wetland area in the North Street Wildlife Management Area. Pond Brook is classified as a cold water fishery.

Goddard Brook

Goddard Brook, classified as a cold water fishery, originates in the minimally populated Dry Hill area of eastern Montague. The brook then parallels Dry Hill Road, crosses Route 63 into the western half of the Town, where it joins the Sawmill River in Montague Center. A severe storm in June 1996 resulted in flooding along Goddard Brook and major damage to Dry Hill Road and Wonsey Road, including complete washouts at several sites where the river crosses the road. Further development in the watershed of Goddard Brook has the potential to increase flooding during storm events.

Cranberry Pond Brook

Cranberry Pond Brook originates at the northern end of Cranberry Pond in the Town of Sunderland. The brook flows northwest through Montague farmland. The severe storm of June 1996 resulted in flooding that severely damaged Old Sunderland Road at the crossing of Cranberry Pond Brook. After crossing Old Sunderland Road, the brook drops sharply in elevation and supports an extensive wetland prior to crossing Meadow Road, where it joins the Connecticut River in Montague's southwestern corner. It is classified as a cold water fishery.

Spaulding Brook

Originating in the forested upland of the Montague Wildlife Management Area in southeastern Montague, Spaulding Brook flows into the Sawmill River at Spaulding Brook Road near the Town's border with Leverett. The severe storm of June 1996 resulted in flooding at the confluence with the Sawmill, destroying the road at this location. The culvert and road were reconstructed to allow access from Spaulding Brook Road to the southern section of Ripley Road, but access to the northern section of Ripley Road was determined to be too expensive to

repair, and the road was permanently closed at this location. Spaulding Brook is classified as a cold water fishery.

Chestnut Hill Brook

Chestnut Hill Brook originates in a wetland area in the portion of Montague Wildlife Management Area that borders the Town of Wendell. It flows southwesterly parallel to East Chestnut Hill Road, crossing the road twice before joining the Sawmill River in North Leverett. The severe storm of June 1996 resulted in flooding that washed out both of the road crossings on East Chestnut Hill Road. Construction of homes on roadside frontage lots along East Chestnut Hill Road may have contributed to flooding. Chestnut Hill Brook is classified as a cold water fishery.

Hannegan Brook

Hannegan Brook originates in the uplands of northeastern Montague and flows into Lake Pleasant in central Montague and is classified as a cold water fishery. Virtually the entire watershed of Hannegan Brook—approximately 1300 acres—was purchased by the Turners Falls Fire District to protect the waters of Lake Pleasant, which at the time of purchase was the Town's primary water supply. As a result, the water in the brook is exceptionally pure.

Williams Brook

Williams Brook originates where several smaller streams join to form an extensive wetland on the border between Montague and Wendell in the southeastern corner of town. It flows south and west into North Leverett, eventually flowing into the Sawmill River, and is classified as a cold water fishery.

Beaver Pond

Beaver Pond, also known as Beaver Hollow, is located between Millers Falls Road and the Millers River east of the village of Millers Falls. The pond is the remains of an oxbow in the Millers River. Residents of Millers Falls have long advocated for permanent protection and public access to this property, which is currently privately owned.

Lyons Brook

Lyons Brook begins at Ruggles Pond in Wendell State Forest and flows approximately two miles northwest to the Millers River, forming a portion of the boundary between Wendell and Montague. About three-quarters of a mile of Lyons Brook lies within the Wendell State Forest. The remainder flows through private land. The brook drains approximately 3.5 square miles, which is roughly 91% forested. The brook is assessed as supporting aquatic life uses, but fish consumption is impaired due to PCBs in sediment and fish tissue from the Millers River. Recreation uses were not assessed. Aesthetics are supported with an alert status due to the presence of the Mormon Hollow Demolition Landfill, located near the confluence of Lyons Brook and the Millers River in Wendell. The landfill experienced slope failure in 2000 but has

since been stabilized.²¹ Lyons Brook is classified as a cold water fishery. Logging in the watershed has resulted in erosion and sedimentation of the brook.

C.2.5 Other Lakes and Ponds

Lake Pleasant and Green Pond

Lake Pleasant and Green Pond are located in central Montague. The lake was the focal point of a summer spiritual retreat developed in the 19th century, which evolved into the permanent settlement of the village of Lake Pleasant. The Turners Falls Fire District owns both Lake Pleasant and Green Pond, which were the Town's main sources of water until 1965. Lake Pleasant covers fifty-three acres and has a storage capacity of approximately 150 million gallons. It is connected to Green Pond, a 15-acre reservoir that holds approximately 40 million gallons. In 1994, the Lake Pleasant and Green Pond Reservoirs were downgraded to emergency water supplies by the Department of Environmental Protection. They cannot be used directly for water supply unless the District builds a filtration plant. District voters have not to date approved the significant expenditure that filtration would require.

Lake Pleasant and Green Pond are located in a high yield aquifer area, which covers a large portion of western Montague. The new Hannegan Brook Well located near Lake Pleasant came online in 2014 and functions as a back-up water supply that can yield 1.44 MGD to meet future water demands. This new source is greatly needed, as the two existing wells at Tolan Farm are being pumped close to the maximum capacity. Abandonment of Lake Pleasant and Green Pond as water supplies could make them available for swimming and other recreational uses. However, according to the DEP, Lake Pleasant is hydrologically connected to the new Hannegan Brook Well, and swimming will continue to be prohibited in the lake. Additionally, the Water Department and Fire District have concerns with allowing swimming in Green Pond due to its relative small size and shallow depth, which could result in high bacteria levels in the summer months.²²

"Podlenski's Pond"

Located at the intersection of Routes 63 and Gunn Road, "Podlenski's Pond" provides habitat for the Jefferson Salamander, a Massachusetts "Species of Special Concern."

West Pond

West Pond, located on the east side of Main Street south of Montague Center, is in the Zone I for the Montague Center well.

Montague Center School Pond

The Montague Center School pond is located south of the former Montague Center School building on School Street. In the past, the pond was used for ice skating in the winter and was

²¹ *Millers River Watershed 2000 Water Quality Assessment Report*. Massachusetts Department of Environmental Protection, March 2004. <http://www.mass.gov/eea/docs/dep/water/resources/07v5/35wqar.pdf>.

²² Personal communication, Turners Falls Water Department, October 6, 2016.

stocked for a fishing derby in the spring, but is no longer available for recreational use. The depth of this pond has significantly decreased due to deposition of sediment. Members of the community would like the pond to be maintained for recreational use.

"Lucas' Pond"

"Lucas' Pond" is located west of Greenfield Road and south of the Boston & Maine Railroad tracks just east of the Connecticut River. The pond was created by construction of a dam approximately fifty years ago, and has been privately managed for wildlife. Sediment flowing from the site of the old railroad bridge on Greenfield Road in 2001 reached the pond; the sedimentation of the pond is extensive.

C.3 Class A Waters

In the Town of Montague, both Green Pond and Lake Pleasant and their 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. They currently serve as emergency water supplies for the town. 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: Massachusetts Surface Water Quality Standards.²³

C.4 Groundwater Resources

Groundwater, the water that resides under the surface of the Earth in spaces between sediment grains and rock fractures, is an important resource. Groundwater provides clean drinking water for many communities, as well as irrigation water for farming, and industrial uses. Water enters the ground as precipitation falls on the Earth and soaks in, or infiltrates. Once in the ground, the water "flows" or moves slowly through ground layers by gravity. Water moves through the soil by gravity and collects in a saturated zone. The top of the saturated zone is called the water table. As water moves down through the ground layers, it is naturally filtered and purified. This purification process is considered to be one of the "ecosystem services" provided by natural landscapes, with little cost to consumers.

Wells must be drilled into the saturated zone to yield water, or into layers known as aquifers. Aquifers are layers of rock or sediment that are porous and well-suited to holding a lot of water, like a sponge. In this region these layers are often sand and gravel deposited by the receding continental glacier. These aquifer layers supply many municipal water systems, private wells, and irrigation for farms, and as such they are critically important resources.

²³ Massachusetts Department of Environmental Protection website:
<http://www.mass.gov/eea/agencies/massdep/water/regulations/314-cmr-4-00-mass-surface-water-quality-standards.html>. Accessed December 29, 2016.

An important aspect of an aquifer is the recharge area – the area of the landscape where infiltrating water enters the aquifer layer. If water is prevented from entering the aquifer, then pumping water from the aquifer will eventually deplete the resource. It is important to prevent development in recharge areas. Pavement prevents rainwater from entering the ground, directing it instead to storm drains and thus to streams and rivers. Pollutants from streets, buildings, and industry in developed areas may also enter the aquifer. Thus protected open space helps preserve the integrity of ground water resources.²⁴

According to MassGIS and U.S. Geological Survey (USGS) documents, Montague contains a portion of a large high-yield aquifer, defined as an aquifer with the potential to provide a pumping volume of twenty-five (25) to 1,000 gallons per minute. In Montague, this aquifer is located along the Connecticut River from the Vermont border to Erving and Millers Falls. It extends from Millers Falls southwest to the Plains, surrounding Lake Pleasant and Green Pond, and west and east of Taylor Hill. Along the western slopes of Taylor Hill, the aquifer follows the Sawmill River to the Connecticut. Around its eastern slopes the aquifer stretches south to Cranberry Pond in Sunderland (*See Water Resources Map at end of Section 4*).

In 2007, Nestle Waters North America conducted preliminary studies of conservation land on the Montague Plains owned by the state's Division of Fisheries and Wildlife to determine the suitability of the high-yield aquifer for use as a source of bottled drinking water. Although Nestle ultimately decided not to pursue the project further due to the complexity of complying with state statutes, similar proposals could be advanced in coming years as clean drinking water becomes an increasingly scarce resource. Many residents of Montague and surrounding towns sharing the aquifer raised concerns about corporate control of a natural resource and the potential for a project of that nature to drain water sources for towns in the Pioneer Valley, and suggested the need to provide more secure protection for water resources.

Montague's surficial geology has characteristics that also support low to medium yield aquifers. A low-yield aquifer provides a potential yield of between 0 and 50 gallons per minute. According to MassGIS and the USGS, all areas of Montague other than the Dry Hill Area east of Route 63, Taylor Hill and Wills Hill have characteristics that would support low to medium yield aquifers.

The Massachusetts Department of Environmental Protection strictly regulates an area within a radius of 100 to 400 feet of public water supply wells, depending on the pumping rate. This area is known as the "Zone I," or primary recharge area. Secondary 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. A hydrological study done in the early 1990s delineated the Zone II recharge area to the Tolan Farm Wells for the Turners Falls Water District. This Zone II and the "Interim Wellhead Protection Area" indicating the Zone I for the Montague Center well make up the Town's Water Supply Protection Overlay Zoning

²⁴ Marshak, S. 2004. *Earth: Portrait of a Planet*. W.W. Norton and Co. New York, NY.

District (WSPD). In 2010, the Water Supply Protection Overlay Zoning District was expanded to include the Zone II recharge area for the new Hannegan Brook Well.

The Turners Falls wells are located in a deep, pre-glacial sand and gravel aquifer that is confined in the immediate vicinity of the wells, partially confined in other portions of the aquifer, and possibly unconfined along the aquifer boundaries. The wells are considered to be highly vulnerable to contamination because the clay confining layer does not extend across the entire aquifer. (Massachusetts Department of Environmental Protection, 2003).

C.5 Flood Hazard Areas

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

The 100- and 500-year floodplains are mapped by the National Flood Insurance Program (NFIP) after study of waterways. The 100-year floodplain is used for regulatory purposes. In Montague, floodplains for the Connecticut River, Millers River, Sawmill River, Pond Brook and Hatchery Brook were mapped in 1978. Comprehensive flood maps for the town were produced in 1982.

In Montague, 1,454 acres, 7% of the total land area, is in the floodplain, including approximately 14 acres of developed residential land.²⁵ According to the NFIP, one hundred year flood plains in Montague occur along the Connecticut River at the Patterson Farm on Greenfield Road, and in the southern section of Town at the confluences with the Sawmill River and Cranberry Pond Brook. Beaver Hollow is in the 100-year floodplain of the Millers River. The Sawmill River floodplain crosses North Leverett and Spaulding Brook Roads at their intersection, then narrows as the river travels along North Leverett Road, broadening again as the river approaches Montague Center near South Main Street. The 100-year floodplain for Hatchery Brook crosses South Ferry and Greenfield Roads at their intersection. Hannegan Brook has a floodplain east of Route 63 and west of B & M Railroad before it joins Lake Pleasant, and the floodplain for Pond Brook extends from Lake Pleasant to Clapp’s Pond. In a 100-year storm, Cranberry Pond Brook floods farm fields and Meadow Road before joining the Connecticut River. Detailed studies have not been performed for other waterways.

²⁵ 2005 MassGIS land use data.

The 2014 *Montague Multi-Hazard Mitigation Plan* identifies the following areas as prone to flooding:

- Montague Center at the junction of the Sawmill and Connecticut Rivers
- Montague City Road, between the road and the power canal
- Franklin County Technical School ballfields and driveway
- Meadow Road, adjacent to the Connecticut River
- Hillcrest School, due to frozen dry wells

In addition, Montague City Road between Warner Street and Walnut Street floods seasonally from a stream located adjacent to the road in this area.

Fluvial erosion hazard (FEH) zones are areas along rivers and streams that are susceptible to bank erosion caused by flash flooding. Any area within a mapped FEH zone is considered susceptible to bank erosion during a single severe flood or after many years of slow channel migration. While the areas of the FEH zones often overlap with areas mapped within the 100-year floodplain on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), the FIRMs only show areas that are likely to be inundated by floodwaters that overtop the riverbanks during a severe flood. However, much flood-related property damage and injuries is the result of bank erosion that can undermine roads, bridges, building foundations and other infrastructure. Consequently, FEH zones are sometimes outside of the 100-year floodplain shown on FIRMs. FEH zones can be mapped using fluvial geomorphic assessment data as well as historic data on past flood events. Both the FIRMs and FEH maps should be used in concert to understand and avoid both inundation and erosion hazards, respectively.²⁶

C.6 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 for a significant portion of the growing season. Sometimes, the term “wetlands” is used to refer to surface water as well.

Historically, wetlands have been viewed as unproductive wastelands, to be drained, filled and “improved” for more productive uses. More recently, 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 traps 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

²⁶ *Ammonoosuc River Fluvial Erosion Hazard Map for Littleton, NH*. Field Geology Services, 2010.

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 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.

Wetlands can be found along the banks of many of Montague’s rivers, ponds and streams, as well as in isolated forested areas. Some of these wetlands are mapped by the National Wetlands Inventory (NWI) (see the Water Resources Map at the end of this section). Others are not mapped, but are well-known to local residents and members of the Conservation Commission. The following list identifies major wetland areas in Montague, but is by no means comprehensive. All wetland areas, mapped and unmapped, serve important functions and should be protected.

Sawmill River

There is extensive floodplain forest along the Sawmill River west of Meadow Road. East of South Ferry Road, the wet meadows in the Sawmill floodplain are used for hay and pasture. Floodplain forest is also found in the North Street Wildlife Management Area between Center Street and Swamp Road, and in the area of the Tolan Farm wells. Beavers have built several dams along the Sawmill in this area. There are smaller wetland areas mapped along the east side of the Sawmill west of Route 63 and south of the village of Montague Center, as well as along the river north of Ripley Road and east of Spaulding Brook Road.

Cranberry Pond Brook

There is mapped floodplain forest along Cranberry Pond Brook east and west of Old Sunderland Road. Extensive swamps characterize the area along the brook east of Meadow Road. Beavers are very active in this area.

Pond Brook

Forested wetlands coincide with the mapped floodplain along Pond Brook from Lake Pleasant Road to its confluence with the Sawmill River.

Goddard Brook

East of Route 63, the banks of Goddard Brook are bordered by forested wetlands as the river flows south to its confluence with the Sawmill in the North Street Wildlife Management Area.

Ponds in Montague Center

There are wetlands south of West Pond and the Montague Center School Pond and north of Four Corners Pond. Podlenski's Pond is shallow and surrounded by wetland vegetation.

West Street

There is an extensive area of wetlands fed by streams at the southwest end of West Street. This area drains the eastern side of Taylor Hill and is mostly undeveloped. Any future development in this area should be designed to protect wetlands and accommodate natural drainage patterns.

Turners Falls Road and Greenfield Road

There are wetlands bordering several unnamed streams between Greenfield Road and Turners Falls Road.

Randall Brook

There is a small area of mapped wetlands along Randall Brook near its intersection with Greenfield Road. This area is proposed for creation of additional wetlands to compensate for wetlands to be destroyed when Greenfield Road is reconstructed.

Power Canal

Seepage from the Turners Falls Power Canal feeds a large wetland area in Montague City between Montague City Road and the Power Canal northeast of Depot Street. Beavers have been very active in this area in the past several years, creating conflicts with homes and utility company infrastructure.

Montague City Road

The stream that runs along the southeast side of Montague City Road is bordered by wetlands along much of its length. This stream drains a large section of the hill in Turners Falls and Montague City Road, and has become filled with sediment. Beavers have also been active in this area, resulting in flooding on the Thomas Memorial Golf Course.

Turners Falls Road & Gun Club

On the banks of the Connecticut River at the end of Deep Hole Drive, there is a shallow wetland area at the Turners Falls Rod & Gun Club.

West Mineral Road

There is an extensive area of wetland vegetation bordering an unnamed pond and stream east of West Mineral Road and west of the Turners Falls Airport. This is an area that has been identified for future industrial development. Any development in this area must be carefully planned to protect wetland resources.

Beaver Hollow

Floodplain forest characterizes the area between the Millers River and the old Oxbow known as Beaver Hollow.

Montague Plains Kettle Holes

There are several kettle hole ponds on the Montague Plains north of Greenfield Road and east of Lake Pleasant Road and Mineral Road. Kettle hole ponds are wet depressions formed by melting of isolated glacial icebergs. Two of these kettle hole ponds are state-certified vernal pools (see below for discussion of vernal pools), and at least one of them supports endangered plant species.

Chestnut Hill/Catamount Swamp

There are mapped forested wetlands along Chestnut Hill Brook on Montague's eastern border with Wendell. There is also an extensive section of Catamount Swamp east of East Chestnut Hill Road in this area. South of Chestnut Hill Loop, there is another wetland area on the Town's southern border with Leverett. These areas are very sparsely populated and serve as extremely valuable habitat for wildlife.

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

A Source Water Assessment Program (SWAP) Report conducted for the Turners Falls Fire District by the Massachusetts Department of Environmental Protection in 2002 identified a variety of potential threats to groundwater in the recharge area for the Turners Falls Fire District Wells (see Table 4-3). Please note that the potential threats (H-high, M-medium, L-low) relate to the type of activity, not to any specific site in Montague. For example, an auto service station is considered to be a high threat due to the fact that petroleum products are handled and stored on-site. A specific station may be in full compliance with all state regulations concerning known contaminants to groundwater, but this would not change the rating for this use.

The activities listed in Table 4-3 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSCs). When specific potential contaminants were not known for a facility, DEP identified typical potential contaminants or activities for that type of land use. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, and may use Best Management Practices (BMPs) to prevent contaminants from reaching drinking water supplies.

It is important to understand that an actual release may never occur from a potential source of contamination if the facility is using BMPs. The threat rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and

groundwater. The threats shown in the table, therefore, are generic, rather than specific to a particular facility in Montague. If BMPs are in place, the actual risk may be lower than the threat ranking identified by DEP. Many potential sources of contamination are regulated at the federal, state and/or local levels to further reduce the risk.²⁷

The SWAP report made a variety of recommendations to protect Montague's drinking water:

- Manage and control new residential development in water supply protection areas;
- Educate residents and local businesses, including farms, on best management practices for protecting water supplies;
- Develop local regulations to address use, storage and disposal of hazardous materials;
- Map stormwater discharges in water supply protection areas and develop a local stormwater control ordinance;
- Implement best management practices for road maintenance in water supply protection areas, including limited use of road salt and cleaning of catch basins; and;
- Develop wellhead protection plans.

In 2005, the Turners Falls Water District conducted a Source Water Assessment of Lake Pleasant, Green Pond and the Tolan wells under the auspices of the Massachusetts Rural Water Association. In 2005 the Turners Falls and Montague Center Water Districts collaborated on the purchase of 100 acres near the Montague City well that are also located in the Turners Falls recharge area.

Table 4-3: Potential Sources of Contamination in the Turners Falls Aquifer Recharge Area

Activities	Quantity	Threat	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use — Crop land	Numerous	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use — Crop land	Numerous	H	Pesticides: leaks, spills, improper handling, or over-application
Livestock Operations	2	M	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	Numerous	H	Manure (microbial contaminants): improper handling
Commercial			
Service Stations/ Auto Repair Shops	2	H	Automotive fluids and solvents: spills, leaks, or improper handling
Furniture Stripping and Refinishing/ Window refurbishing	1	H	Hazardous chemicals: spills, leaks, or improper handling
Bus and Truck	1	H	Fuels and maintenance chemicals: spills, leaks, or

²⁷ *Source Water Assessment and Protection (SWAP) Report for the Turners Falls Water Department*. MA Department of Environmental Protection, 2002.
<http://www.mass.gov/eea/docs/dep/water/drinking/swap/wero/1192000.pdf>

Activities	Quantity	Threat	Potential Source of Contamination
Terminals			improper handling
Car/Truck/Bus Washes	1	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Sand And Gravel Mining/Washing	3	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Residential			
Fuel Oil Storage (at residences)	Numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aboveground Storage Tanks	Numerous	M	Materials stored in tanks: spills, leaks, or improper handling
Clandestine Dumping/junk piles	1	H	Debris containing hazardous materials or wastes
Clean Water Act permitted discharges	1	L	Various depending on discharge limits
Floor Drains/Dry Wells	2	—	Owners are currently conducting closure; contact the DEP regional coordinator for status and information.
Small quantity hazardous waste generators	Numerous	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	Unknown	H	Stored materials: spills, leaks, or improper handling

Source: Source Water Assessment and Protection (SWAP) Report for the Turners Falls Water Department. MA Department of Environmental Protection, 2002.

<http://www.mass.gov/eeal/docs/dep/water/drinking/swap/wero/1192000.pdf>

D. VEGETATION

Plants are critical components of ecosystems. Plants use solar energy to convert carbon dioxide (CO₂), water, and various minerals into food, in the process called photosynthesis. This process removes CO₂ from the atmosphere and releases oxygen. Plants are the source of nearly all the oxygen in Earth's atmosphere. Plant biomass in turn supports all animal life. In

addition to being a food source, plants also serve as shelter and habitat for many mammals, birds, and insects. Plants also help to moderate temperature and rainfall, and their roots prevent soil erosion. Many plants also provide us with building materials, fiber, and medicines.

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 70 percent of Montague's total land area. The town's forests are diverse, including hardwoods and conifers, pitch pine-scrub oak forest, and floodplain forest. Natural areas that are not forested are used for crops and pasture. This section describes vegetated areas in town and their ecological and economic significance.

D.1 Forests

Montague is located in the Transition Hardwoods-White Pine Forest Region (USDA, 1992). This forest type commonly occurs up to an elevation of 1,500 ft. above sea level in upland central Massachusetts and southern New Hampshire, northward through the Connecticut Valley.

Hardwood-White Pine Forest

The majority of Montague's forested land is located east of Route 63. This area is characterized by northern hardwoods including yellow and paper birch (*Betula alleghaniensis* and *Betula papyrifera*), beech (*Fagus grandifolia*) and sugar and red maple (*Acer saccharum* and *Acer rubrum*). In drier areas, red oak (*Quercus rubra*) is the most abundant deciduous species; other oaks and white pine can also be found. Hemlock (*Tsuga canadensis*) occurs in moist cool valleys, north and east slopes and sides of ravines.

White pine (*Pinus strobus*) is characteristic of well-drained sandy sites. It occurs as a scattered tree in hardwood forests, but is most common in southwest Montague in the area west of Route 47; west of Turners Falls Road in very sandy soils, and north of the state fish hatchery.

Pitch Pine-Scrub Oak Forest

The Montague Plains is the largest inland Pitch-Pine Scrub Oak (PPSO) community in southern New England, and the only large remnant of this ecosystem in the Connecticut River Valley. PPSO barrens are vegetative communities occurring on deep, coarse, well-drained sands derived from glacial outwash. The sands are acidic, poor in nutrients and prone to drought. Pitch pine-scrub oak barrens are maintained by fire, which increases the rate of cycling of nutrients to the soil. Without disturbance by fire, tree-sized oaks and white pine can take over. The main tree species of the barrens is pitch pine (*Pinus rigida*) and the dwarf chinquapin oak (*Q. prinoides*). Huckleberry (*Gaylussacia baccata*), and low bush blueberries (*Vaccinium*

angustifolium and *V. pallidum*) are also common. The inland pitch pine-scrub oak communities have successional areas with trembling aspen (*Populus tremuloides*), gray birch (*Betula populifolia*), and black cherry (*Prunus serotina*).

In 1908, the Commonwealth of Massachusetts paid \$140 to purchase about twenty-five acres of land on what was then called Millers Plain “for the purpose of experiment and illustration in forest management.” Over the next seventy-five years, the Commonwealth purchased additional parcels in the area, including what is now the Bitzer Fish Hatchery. In 1999, the Commonwealth purchased nearly 1,500 acres from the Quinnehtuk Corporation “for fish and wildlife conservation, natural habitat protection, and associated public recreation,” creating the Montague Plains Wildlife Management Area. Recent years have seen the addition of another 175 acres, bringing the total area protected on and around this regionally important glacial sandplain to nearly 1,800 acres.

Trees were harvested during the 18th and 19th centuries, and farmers subsequently plowed most of the area for crops. The marginal cropland was abandoned by the early 20th century, and dense thickets of pitch pine seeded in on the plowed areas. Periodic high-intensity wildfires were common, including the 1907 fire that destroyed 130 homes in Lake Pleasant, a 1200-acre fire in 1937, a 1000-acre fire in 1944, a 475-acre fire in 1957, and several 100-acre fires. Fire suppression efforts increased and improved after these wildfires, and recent decades have seen more frequent, but smaller, wildfires. Between 1939 and 1985, these suppression efforts allowed large areas of young pitch pine to grow into an extensive closed canopy forest. Fire-intolerant species such as white pine began filling in underneath, and in 1999, a dense forest of mixed pitch pine and white pine covered most of the sandplain. The historical shrubland with scattered oak and pitch pine trees remained only in a few small areas that had never been plowed. Habitat quality for native, fire-adapted plant and wildlife species declined with these changes.

Over the past 16 years, the Massachusetts Division of Fisheries and Wildlife (MassWildlife) has used a combination of tree harvesting, shrub mowing, and prescribed burning to benefit rare species and to reduce the risk of a catastrophic wildfire. Approximately 880 acres have been treated since 2004 to restore woodland and shrubland habitats of scattered oak and pitch pine trees over shrub oaks, blueberry, huckleberry, and other heath species. MassWildlife has cooperative agreements with the Department of Conservation and Recreation and the Town of Montague Conservation Commission to restore sandplain habitats on their inholdings within the WMA, and works closely with local fire departments and the DCR Bureau of Fire Control to ensure that firefighters have adequate access in the event of a wildfire and are familiar with the changes in vegetation and fuels resulting from habitat management activities.

According MassWildlife, the response by wildlife to restoration has been very encouraging. For example, researchers from UMass recently reported that the restoration “supports songbirds of regional conservation concern, promotes a distinctive bee fauna, creates preferred habitat for hognose snakes, and provides foraging and nesting habitat for whip-poor-wills.” In 2015, a

climate change adaptation analysis identified management goals, objectives, and tools for the sandplain natural communities at the Montague Plains WMA. The analysis assessed potential broad-scale climate change impacts and vulnerabilities, evaluated management objectives in the light of these impacts and vulnerabilities, identified adaptation approaches and tactics for implementation, and proposed criteria for monitoring the effectiveness of implemented actions. This analysis and its implementation are being integrated into an updated habitat management plan for the WMA.²⁸

Floodplain Forest

Floodplain forests are deciduous, forested wetland communities found along rivers and streams that flood on an annual or semi-annual basis. According to the Natural Heritage and Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife, there are several types of floodplain forests in the Town of Montague: major river floodplain forests which occur along the Connecticut River; transitional floodplain forests such as those that are found along the lower Sawmill River; and the small-river floodplain forest found along tributaries of the Connecticut River.

All floodplain forests in Massachusetts have silver maple (*Acer saccharinum*) as the dominant tree species. Associated plant species vary depending upon location and degree and duration of flooding. In the major-river floodplain forest, silver maple covers more than 60 percent of the overstory with cottonwood (*Populus deltoides*) accounting for the remainder. There are no shrubs. The herbaceous vegetation includes stinging nettles (*Laportea canadensis*), ostrich fern (*Matteuccia struthiopteris*), whitegrass (*Leersia virginica*), woodreed (*Cinna arundinacea*), and jack-in-the-pulpit (*Arisaema triphyllum*). Major-river floodplain forests on islands have cottonwood, sycamore (*Platanus occidentalis*) and American ash (*Fraxinus americana*) in addition to the silver maple. Box elder (*Acer negundo*) is common in the understory of these floodplain forests, and the herbaceous vegetation is dominated by ostrich fern. Disturbed areas will also have staghorn sumac (*Rhus typhina*), bittersweet (*Celastrus orbiculata*), riverbank grape (*Vitis riparia*) and Virginia creeper (*Parthenocissus quinquefolia*).

Transitional floodplain forests have silver maple as the dominant species in the canopy, with green ash (*Fraxinus pennsylvanica*) also present. There are no shrubs and vines. Hog peanut (*Amphicarpaea bracteata*) is abundant. The herbaceous vegetation consists of a mixture of stinging nettle, ostrich fern, sensitive fern (*Onoclea sensibilis*) and false nettle (*Boehmeria cylindrica*).

Shrub vegetation in small-river floodplain forest consists of silky dogwood (*Cornus amomum*) and buttonbush (*Cephalanthus occidentalis*). The herbaceous vegetation is most diverse in these

²⁸ This section excerpted from “Background information on Montague Plains Wildlife Management Area,” by the Division of Fisheries and Wildlife, for a habitat site walk and information session held in Montague on September 29, 2016.

areas. Sensitive fern and false nettle are most common, with water hemlock (*Cicuta maculata*), swamp candles (*Lysimachia terrestris*) and water parsnip (*Sium suave*) also present.

Major owners of forestland in Montague include the state Department of Fish and Game, the state Department of Conservation and Recreation, the Turners Falls Fire District, FirstLight Power, and Eversource. These public and quasi-public forests provide for many of Montague's available recreational opportunities including walking, hiking, fishing, skiing, snowshoeing, hunting, snowmobiling, picnicking and nature study.

The remaining forest lands in Montague are privately-owned. Forest landowners in town fall into five main categories: forest residence, farm woodlot, family land, commercial woodlot, and investment property. In some cases, the categories may overlap.

Approximately 11 percent (1,618 acres) of the town's forest is enrolled in the Chapter 61 current use tax program. This provision of state law, also known as the Forestland Act, allows for reduced property tax assessment in exchange for a commitment for maintaining land in active forestry use. Chapter 61 also grants the Town the right of first refusal to purchase land enrolled in the program at its fair market value when it is sold for or converted to residential, commercial or industrial purposes. To qualify for Chapter 61, a landowner must have at least 10 acres of contiguous forestland and a state-approved 10-year forest management plan. Property taxes are assessed at valuations based on forest production purposes, rather than the development value of the property. If the land is sold for or converted to an ineligible use within five years of withdrawing from the program, the owner must notify the Town, triggering a 120-day right of first refusal period, and must pay either a Conveyance Tax or a Roll-Back tax. There is no penalty if the land leaves the program and is then converted to a use covered in Chapter 61A (agriculture) or 61B (open space and recreation).²⁹

Commercial harvest of forest products is subject to the Massachusetts Forest Cutting Practices Act. Landowners who harvest 25,000 board feet of timber or more from forestland at any one time must file a "forest cutting plan," unless trees are cut for conversion to another land use such as agriculture. The plan is reviewed and approved by the Department of Conservation and Recreation (DCR). DCR publishes a "Best Management Practices" manual for timber harvesting that is designed to help landowners prevent erosion and protect wetlands and water bodies and the animals that rely on wetland habitat during a timber harvest. Local conservation commissions receive a copy of all forest cutting plans, which is one way that a town can monitor use and management of privately owned forest land.

Forest residences consist of homes on large forested lots. These homes are principally located east of Route 63 on Chestnut Hill Road, East Chestnut Hill Road, Dry Hill Road and Wendell Road, with a few scattered residences in the Taylor Hill area, East Mineral Hill and Greenfield Road. Many are senior citizens who have inherited land and/or owned and managed it for its

²⁹ See the UMass Amherst MassWoods website on Chapter 61 for more information:
<http://masswoods.net/landowner-programs/chapter-61-current-use-tax-programs>

natural values for decades. These properties may be at risk for development if the heirs of the current owners are not interested in living on the land and maintaining it as forest. The town could work with local land trusts to offer resources on estate planning for owners of forestland who wish to conserve it.

Another type of forest residence is wealthier, middle-aged new residents of town who have built very large homes on secluded forest lots. This may be a growing trend with mixed implications for forest conservation. These residences are being built at very low densities. Owners of these homes value the aesthetic beauty and privacy of the forest, and can be expected to support conservation efforts. On the other hand, this type of development has the potential to fragment the town's large blocks of forestland.

The second category of private owners of forest is farmers whose land includes working woodlots. Most of the active farms in Montague include land in this category. Farm woodlots produce income outside of the growing season from sales of cordwood, and in some cases, maple syrup. Some land in this category has been in the same families for generations. However, most of these owners are over the age of fifty and are starting to scale back their agricultural operations. Many do not have heirs that intend to continue farming. These lands may be at risk of development when the current owners retire or pass away. The Town could offer assistance to farm woodlot owners who wish to plan for conservation of their land.

There are some large forest properties in Montague owned by non-residents of Town. This land is not enrolled in Chapter 61, and the Town has no information on the plans of these absentee owners. There are also a few large tracts of forestland in Montague that are owned by people who live elsewhere, and are managed for cordwood and timber. This land is enrolled in Chapter 61.

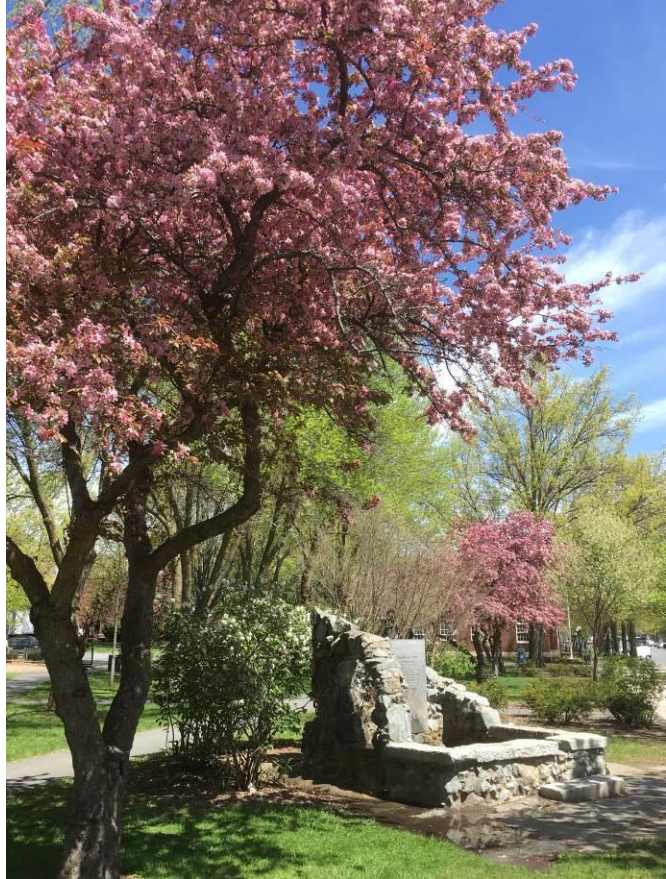
Finally, there are a number of large forest properties in Town that are being held for their development value. Land in this category includes properties on the east side of Route 63, a tract of approximately 100 acres between East and West Chestnut Hill Roads on the border with Leverett and a 100-acre property off South Prospect Street and Grout Circle in Millers Falls were purchased for development. Large-lot zoning (4-acre minimum lot size) in the eastern half of town has the potential to create forest sprawl if these parcels are developed at full density. The Town is considering zoning changes to allow for clustering of homes on smaller lots, in exchange for permanent preservation of the remaining land through conservation restrictions. Such "conservation subdivisions" could help protect large blocks of forestland. Developments should ideally be designed to protect forest land that is contiguous to other protected land.

D.2 Shade Trees

Public shade trees live along Montague's roads and in its villages, parks, and cemeteries. These trees promote both environmental quality and quality of life for residents. In downtown Turners Falls, Cherry and Apple trees were planted along Avenue A as part of streetscape

improvements in the 1980s. These ornamental trees make the downtown more attractive to residents and visitors, helping to support the local shops and restaurants by creating a vibrant urban space. The street trees provide shade in the summer months, and act as a beautiful backdrop in the spring. Streetscape improvements in Millers Falls, completed in 2006, included the addition of new street trees as well. These trees are maintained by the Department of Public Works.

Other areas in town that include public shade trees are town parks and cemeteries. The Town of Montague owns public parks in Turners Falls, Millers Falls, Montague Center, and Lake Pleasant. Unity Park, Highland Park, Montague Center Park, and Rutter's Park are maintained by the Town and managed by the Town Parks & Recreation Department. Peskeomskut Park in Turners Falls is managed by the Board of Selectmen. The Town owns seven cemeteries which are maintained by the Cemetery Commission. A Downtown Streetscape Committee, made up of volunteers, maintains the planters along Avenue A in Turners Falls with assistance from the Department of Public Works.



Trees in Peskeomskut Park provide shade, habitat, and attractiveness to downtown Turners Falls. Photo credit: Linda Hickman

In 2015 a tree inventory was completed for downtown Turners Falls that provides a baseline of the number, location, species, size, and condition of the public shade trees in the downtown. 441 trees were inventoried for the project. Overall, the study found that the trees are well-maintained and in good condition. About 40% of the trees are native species, which tend to resist damage from freezing, drought, and common diseases. The study found that there is a lack of diversity in tree species, with almost half of the trees in the study area consisting of either Norway maples or crabapples. Lack of diversity can lead to greater vulnerability to diseases, which can spread easily from one tree to the next. About 2/3rds of the trees in the inventory have small to medium canopies (between 15 to 30 feet across), and very few trees have large canopies (over 35 feet across). Larger tree canopies provide larger benefits, such as greater shading and cooling in the summer, a greater amount of stormwater interception and storage, and better air quality. Priority strategies resulting from the inventory include

expanding future tree inventories to additional neighborhoods, and increasing DPW staffing to conduct tree maintenance and planting.³⁰



Study area of the 2015 Turners Falls Tree Inventory.

D.3 Agricultural Land

According to MassGIS, in 2005, agricultural land in Montague comprised 8 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. An inventory of farmland conducted for Section 5 of this plan estimates that there are approximately 3,056 acres of farmland in town, roughly 15 percent of the Town's land area. This figure includes agricultural land and farm woodlots enrolled in Chapter 61A, land protected by an Agricultural Preservation Restriction and/or a Conservation Restriction, and unprotected land in agricultural use. Montague's agricultural land is located primarily along the Connecticut River, Sawmill River and Greenfield Road, between East and West Mineral Roads, and along Routes 63 and 47.

Chapter 61A (the Farmland Assessment Act) is a reduced tax assessment program similar to Chapter 61, but is applied to land used primarily for agriculture or horticulture. To qualify for the program, the landowner must own a minimum of 5 acres; must have been devoted to agricultural or horticultural use for at least two prior years; and must demonstrate annual sales of farm products of \$500 per acre for the first five acres, plus \$5 per additional acre of farmland,

³⁰ *Turners Falls Public Tree Inventory*. November 2015. Franklin Regional Council of Governments. Prepared for the Town of Montague Planning and Conservation Department and the Department of Public Works.

and \$0.50 per acre for forestland or wetland. Landowners must reapply annually to the Board of Assessors. Property taxes are assessed at valuations based on agricultural or horticultural purposes, rather than the development value of the property. If a sale or change of use of the land occurs, the owner must notify the Town, triggering a 120-day period when the Town has the right of first refusal to purchase the property for fair market value. The owner may be subject to Conveyance or Rollback Taxes, depending on factors such as when the sale or conversion occurs and when it was purchased. An owner farming the land for more than ten years under Chapter 61A can sell the land at any time without paying the Conveyance Tax. No Rollback Tax is assessed if the land continues to meet the definitions of forest, agriculture, horticulture or recreational land under Chapter 61, 61A, or 61B within five years after the land leaves the Chapter 61A program. There are approximately 1,312 acres enrolled in Chapter 61A in Montague.

The Agricultural Preservation Restriction (APR) Program is a voluntary state program that permanently protects farmland from development by paying farmers the difference between the “fair market value” and the “agricultural value” of the land. Land enrolled in the program is privately owned and managed and remains on the tax rolls, but cannot be developed for houses or any other use that would interfere with its viability for agriculture. The Agricultural Preservation Restriction (APR) must be formally recorded at the Registry of Deeds. Generally, the APR is owned or “held” by the state Department of Agricultural Resources, but it may also be held by the Town, and/or a private land trust. Public access is generally not permitted to land protected by an APR, but specific provisions in the covenant are negotiated based on the landowner’s wishes. Conservation Restrictions (CRs) are similar to APRs, except that they are usually held by the state Department of Conservation and Recreation or a land trust, they may include additional restrictions on the land, and more often permit public access. There are 1,436 acres of farmland in Montague protected by an APR or CR. Permanently protecting farmland not only keeps it from being developed into another use, but also increases the amount of affordable farmland in the region. When APR land is sold, it is sold for its agricultural value, not for its development value. The 2015 *Franklin County Farm and Food System Report* indicated a need for more affordable farmland in the county.

As mentioned earlier in this section, Mount Grace Land Conservation Trust and Red Fire Farm in Montague have partnered together to create an affordable whole farm model. The land trust and farmers share ownership of the farm. The farmers own the buildings, which are restricted to be sold at an affordable price in the future, and lease the land from the land trust at an affordable rate. This arrangement provides long-term protection of affordable land, farm buildings, and housing and supports the financial viability of the farm.

Average farm size in Montague is approximately 80 acres; this is larger than the average farm size for Massachusetts (68 acres), and less than the average farm size for Franklin County (115 acres) (USDA 2012 Census of Agriculture). Median farm size in Montague is approximately 53 acres.

Nine percent, or approximately 270 acres, of farmland in Montague is not protected from development. These lands may be particularly vulnerable to development if the heirs of the current owners are not interested in or able to continue farming. The Town could work with local land trusts to offer technical assistance to farmers who wish to plan for conservation of their land.

D.4 Rare, Threatened and Endangered Plant Species

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

- Along the banks of the Connecticut and Millers Rivers;
- Most of the Montague Plains State Wildlife Management Area;
- A large area surrounding the confluence of Goddard Brook and the Sawmill River and continuing south to encompass Taylor Hill and its environs;
- An area on Route 63 south of the intersection of Sunderland Street and North Leverett Road (where Podlenski's Pond, Cranberry Pond Brook, and the Trout Hatchery is located) which extends south into Leverett;
- The Turners Falls Airport; and
- An area between Green Pond and Millers Falls (NHESP, 2008).

(See the Plant and Wildlife Map at the end of this section).

The 13th edition of the Natural Heritage Atlas (effective October 1, 2008) displays the boundaries of the MESA-protected Priority Habitats and Estimated Habitats throughout the Commonwealth. Estimated Habitats are a sub-set of the Priority Habitats, and are based on the geographical extent of habitat of state-listed rare wetlands wildlife as codified under the Wetlands Protection Act, which does not protect plants. The 2008 Atlas is the product of a statewide revision of Priority Habitat and Estimated Habitats to reflect the latest state-listed species data, understanding of species biology and habitat requirements, and GIS technology and data. These revisions represent the last phase of implementing the revised Massachusetts Endangered Species Act (MESA) regulations, which took effect July 1, 2005. Maps are updated every two years by NHESP and it should be noted that the updated 2006 mapping resulted in a 30% increase in land designated as Priority Habitat in the Town of Montague.

The Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, secs. 61-62H and regulations 301 CMR 11.00) provides the public an opportunity to review proposed projects for environmental impacts, including potential impacts to state-listed rare species. Projects resulting in a "take" of state-listed rare species and disturbing two or more acres of Priority Habitat of Rare Species may be required to file an Environmental Notification Form (ENF) with the MEPA office (301 CMR 11.03(2)).

NHESP has identified 256 native plant species as rare in the Commonwealth, and a number of rare plants have been documented in the Town of Montague. These plants occur in some of the Priority Habitats identified above, including the Plains and floodplain forests. 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 their 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, 2009). Rare plant species in the Town of Montague are listed in Table 4.4.

Table 4-4: Rare Plant Species in the Town of Montague

Taxonomic Group	ScientificName	CommonName	State Status*	Most Recent Observation
Vascular Plant	<i>Alnus viridis ssp. crispa</i>	Mountain Alder	T	2014
Vascular Plant	<i>Amelanchier sanguinea</i>	Roundleaf Shadbush	SC	1991
Vascular Plant	<i>Boechera missouriensis</i>	Green Rock-cress	T	1911
Vascular Plant	<i>Calystegia spithamea</i>	Low Bindweed	E	2013
Vascular Plant	<i>Carex baileyi</i>	Bailey's Sedge	T	2015
Vascular Plant	<i>Carex typhina</i>	Cat-tail Sedge	T	2014
Vascular Plant	<i>Celastrus scandens</i>	American Bittersweet	T	2015
Vascular Plant	<i>Crassula aquatica</i>	Pygmyweed	T	2012
Vascular Plant	<i>Cyperus houghtonii</i>	Houghton's Flatsedge	E	1948
Vascular Plant	<i>Deschampsia cespitosa ssp. glauca</i>	Tufted Hairgrass	E	2014
Vascular Plant	<i>Eleocharis intermedia</i>	Intermediate Spike-sedge	T	2012
Vascular Plant	<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	SC	1911
Vascular Plant	<i>Ludwigia polycarpa</i>	Many-fruited False-loosestrife	E	1984
Vascular Plant	<i>Mimulus moschatus</i>	Muskflower	E	1982
Vascular Plant	<i>Oligoneuron album</i>	Upland White Aster	E	2014
Vascular Plant	<i>Prunus pumila var. depressa</i>	Sandbar Cherry	T	2014
Vascular Plant	<i>Salix exigua ssp. interior</i>	Sandbar Willow	T	2015
Vascular Plant	<i>Scirpus ancistrochaetus</i>	Northeastern Bulrush	E	2006
Vascular Plant	<i>Symphotrichum tradescantii</i>	Tradescant's Aster	T	2014

* SC = Special Concern; T = Threatened; E = Endangered.

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2009, <http://www.mass.gov/dfwele/dfw/nhesp/nhesp.htm>.

E. FISHERIES AND WILDLIFE



Montague's forests, sand plains, 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.

In 2012, the Massachusetts Department of Fish & Game, through the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP), and The Nature Conservancy's Massachusetts Program, developed *BioMap2* to protect the State's biodiversity in the context of climate change. On the statewide level, *BioMap2* helps to guide strategic conservation to protect those areas that are most critical to the long-term survival and persistence of rare and other native species and their related habitats and ecosystems. On the local level, Montague can use this information to better understand where the Town's ecosystems and habitats fit into the bigger picture, and to prioritize land protection efforts.

BioMap 2 divides the state into thirteen distinct ecological regions based on geology, soils and plant and animal communities. Montague falls into two ecoregions. The western section of town is part of the Connecticut River Valley, which is distinguished from its surrounding uplands by milder climate, relatively rich floodplain soils, and level terrain with some higher outcropping ridges. The remainder of Montague falls within the Worcester Plateau, which includes the most hilly areas of central Massachusetts with a few high monadnocks and mountains.³¹ The project maps "Core Habitats" and "Critical Natural Landscapes" that support the long-term persistence of rare and native species. The *BioMap2* project identified 8,289 acres of Core Habitat and 10,365 acres of Critical Natural Landscapes (the two types of landscapes overlap in many areas. See the Plant and Wildlife Habitat Map at the end of Section 4) in Montague that currently support a broad range of wildlife and plant species. These areas include the Connecticut, Millers, and Sawmill River corridors, the Montague Plains, an area between Greenfield Road and Turners Falls Road, most of the forested area east of Route 63, and an area south of Montague Center along the border of Sunderland and Leverett.

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

E.1.1 Connecticut River Valley

The Connecticut River Watershed is home to a diversity of plant and animal life. The mainstem of the Connecticut River is the spine of a much more extensive Core Habitat that connects many of the most biologically important sites in the river valley. Just in the mainstem and adjacent uplands, 91 rare and uncommon species have been found. This large, meandering river hosts

³¹ *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Montague town report. 2012. http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Montague.pdf

seven species of rare dragonflies, including the globally rare Skillet Clubtail and the Midland Clubtail, which is found nowhere else in the state. Below the Turners Dam, the river supports the federally Endangered Shortnose Sturgeon, the state's only population of Burbot, and Eastern Silvery Minnows. The river is also a key breeding and wintering site for Bald Eagles in Massachusetts.³²

The Connecticut River contains some of the highest-quality examples of floodplain forests in the State. Transitional floodplain forest is also found along the Sawmill River in Montague. Floodplain forest provides habitat for a wide variety of insects, which in turn attract warblers, thrushes and other songbirds. Vernal pools, a specialized habitat discussed separately below, are also found in floodplain forest.³³

Nine federally listed endangered, threatened, or candidate species occur within the Connecticut River Watershed. Long-term efforts to restore the bald eagle have been successful. By the 1960s, bald eagles had virtually disappeared from the continental United States, their populations decimated by use of the pesticide DDT. Banning of DDT and efforts to restore eagles to their old habitat have been very successful. Bald eagles now nest in dead trees along the Connecticut, and can frequently be seen fishing in the river.

The construction of dams along the Connecticut River and its tributaries for transportation and hydropower led to significant decline of migratory fish populations in the river. Atlantic salmon, for example, are believed to have been abundant in the Connecticut River prior to European settlement. Salmon are anadromous fish, meaning they hatch in fresh water, travel to the ocean for most of their adult life, and return to fresh water to spawn. Construction of the dam at Turners Falls in 1798 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 Montague and surrounding communities participated in this effort by raising juvenile salmon from eggs, and releasing them in local streams to begin their journey. The program ended in 2012 as a result of budget constraints, the destruction of the White River National Fish Hatchery in Bethel, VT, by Tropical Storm Irene in 2011, and declining salmon populations in the northeast. Poor survival in the ocean became a major obstacle for the restoration program beginning in the 1990s, with very few salmon returning to the river to spawn. Environmental factors such as climate change on the marine environment are a focus of current research.³⁴

Dam removal and the installation of fish ladders at dams along the main stem Connecticut River and several tributaries has helped with restoration efforts of other migratory fish in the watershed. The fishways completed at the Turners Falls Dam in 1980 and the Vernon Dam in

³² *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Montague town report, 2012. http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Montague.pdf

³³ Ibid.

³⁴ Connecticut Department of Energy and Environmental Protection (DEEP), http://www.ct.gov/deep/cwp/view.asp?a=2696&devNav_GID=1630&q=322642; New Hampshire Fish and Game, <http://www.wildlife.state.nh.us/fishing/profiles/atlantic-salmon.html>. Accessed November 7, 2016.

Vermont in 1981, extended the potential reach of migratory fish north to Bellows Falls, VT. Despite the possibility of migratory fish being able to use the main stem of the river to spawn, studies have shown a decrease in the numbers of fish at each upstream barrier encountered, with the greatest decreases occurring at the Turners Falls Dam. Passage rates for American shad, one of the most abundant migratory fish in the river, have never exceeded 11% of the fish passed at the Holyoke Dam, falling well below an established goal of 40% passage rates.³⁵

Shortnose sturgeon are the only federally endangered migratory fish on the Connecticut River. They mature slowly and don't spawn until they reach 8 – 12 years old. Shortnose sturgeon live in the Connecticut River below the Turners Falls Dam to the Long Island Sound. They typically migrate from salt water into rivers to spawn. However, main stem dams impede this species' movements on the Connecticut River and there are now two distinct populations on the river, one between the Turners Falls Dam and Holyoke Dam, and one below the Holyoke Dam. Unfortunately, only the population living above Holyoke Dam is known to spawn successfully.³⁶



Migratory fish at the Turners Falls Dam fish ladder. Photo credit: Linda Hickman

The FERC hydropower relicensing effort is studying the passage problem at the Turners Falls fishway. The new license, to be issued in 2018, could require FirstLight Power to either install new fish passages, change operations, or a combination of both things to improve fish passage through Turners Falls.³⁷

E.1.2 Montague Plains

The Montague Plains falls within the Connecticut River Valley ecological region, but its drought-prone soils and pitch pine-scrub oak communities are dramatically different from the lush floodplain forests along the banks of the Connecticut and its tributaries.

³⁵ Connecticut River Atlantic Salmon Commission: Species Status Report, American Shad (*Alosa sapidissima*). Prepared by the Shad Subcommittee of the Technical Committee, June 2015.

https://www.fws.gov/r5crc/pdf/CRASC_Shad_Status_Report_June_2015_Final.pdf

³⁶ Connecticut River Watershed Council website, <http://www.ctriver.org/river-resources/about-our-rivers/migratory-fish/>. Accessed November 8, 2016.

³⁷ Email correspondence with Connecticut River Watershed Council staff, October 4, 2016.

The rare vegetation of the Plains, discussed in the previous section, provides habitat for a variety of species, including several rare moths (see below). Little is known about these species beyond their affinity for pine barrens habitat, and their larval diet based on scrub oak leaves, pine and other plants found in PPSO communities (Barbour et al., 1998). These rare populations can be severely threatened by aerial spraying for pests such as gypsy moths and disease-bearing mosquitoes. The impact of herbicides on the rare plants and moths of the Plains has not been studied. Use of chemicals with the potential to impact wildlife habitat on the Plains should be extremely limited.

E.1.3 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 (NHESP, 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 Montague, NHESP has identified more than 60 potential vernal pools. “Hot spots” of likely locations of vernal pools include the floodplain forest along the Sawmill River west of Meadow Road, and in forested areas east of Route 63 (NHESP, Spring 2001).

In Spring 2002, the Town worked with Antioch graduate student and resident Annemarie Averill to identify owners of land with potential vernal pools mapped by the NHESP. Averill visited approximately a dozen potential pools between March and May of 2002. Several landowners attended the vernal pool workshop held in April 2002.

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. According to NHESP the Town of Montague has a total of fourteen certified vernal pools. See the *Water Resources Map* at the end of this section for the locations of these certified vernal pools.

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

E.1.4 Upland Forest

As discussed previously, Montague's extensive forests east of Route 63 provide habitat for a wide range of wildlife species. Interior forest, which when combined with forest edges, fields, early successional tree growth, wetlands and vegetated river banks, helps maximize regional biodiversity. Large contiguous patches provide more deep interior forest for species that require areas without excessive disturbances from humans, and that rely on other interior species for food. For example, bobcat are not normally observed along the field edges. The interior areas provide habitat for specialist predators and for mammals that require larger home ranges. Wetland areas within interior forest provide habitat for increasing populations of moose.

E.2 Corridors for Wildlife Migration

Many species of wildlife in Montague 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 that is experiencing development pressure to ensure that animals have the ability to travel across vegetated areas between large blocks of habitat.

Montague is located within several regional belts of protected open space that contribute to the value of protected land in Town. One of the largest Core Habitat areas identified by *BioMap 2* is land within the Quabbin Watershed. West of the Quabbin are three smaller but significant Core Habitat areas around the Holyoke Range, Mt. Toby and the Montague Plains. There is only a third of a mile gap between the Quabbin Watershed and the Mt. Toby Core Habitat via a Core Habitat area and Supporting Natural Landscape in Shutesbury. In addition, Supporting Natural Landscapes in Shutesbury and Wendell are connected to the Montague Plains Core Habitat via the Montague Wildlife Management Area parcels and the Turners Falls Fire District lands in the Dry Hill area. Wildlife probably moves from and into the Quabbin area by way of sparsely or undeveloped open space in Montague and abutting towns, crossing roads when necessary. Ensuring that these forested areas between habitats are protected from development

would support the viability of rare plant and animal populations and facilitate the movement of some species between core habitat areas (See Open Space Map at the end of Section 5).

Connections between bodies of water and sub-watersheds are also important for wildlife and fish. 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 Montague.

E.3 Rare, Threatened and Endangered Wildlife Species

NHESP has identified 176 wildlife species as rare in the Commonwealth, and a number of rare wildlife species have been documented in the Town of Montague. NHESP has mapped several “Priority Habitats of Rare Species” and “Estimated Habitats of Rare Wildlife” in the Town of Montague. (These areas are identified above in Section D.3: Rare, Threatened and Endangered Plant Species; see also the Plant and Wildlife Habitat Map at the end of this section.)

These habitats provide for wildlife species that are endangered, threatened and of special concern. Montague’s rare, threatened and endangered wildlife species are listed in Table 4-5.

Table 4-5: Rare, Threatened and Endangered Wildlife Species found in Montague

Taxonomic Group	ScientificName	CommonName	State Status*	Most Recent Observation
Fish	Acipenser brevirostrum	Shortnose Sturgeon	E	2012
Amphibian	Ambystoma jeffersonianum	Jefferson Salamander	SC	2007
Bird	Ammodramus savannarum	Grasshopper Sparrow	T	2014
Butterfly/Moth	Apodrepanulatrix liberaria	New Jersey Tea Inchworm	E	2013
Dragonfly/Damselfly	Boyeria grafiana	Ocellated Darner	SC	2014
Butterfly/Moth	Callophrys irus	Frosted Elfin	SC	2013
Bird	Caprimulgus vociferus	Eastern Whip-poor-will	SC	2007
Fish	Catostomus catostomus	Longnose Sucker	SC	2003
Beetle	Cicindela marginipennis	Cobblestone Tiger Beetle	E	2007
Dragonfly/Damselfly	Enallagma carunculatum	Tule Bluet	SC	1996
Crustacean	Eubbranchipus intricatus	Intricate Fairy Shrimp	SC	1988
Butterfly/Moth	Euchlaena madusaria	Sandplain Euchlaena	SC	2010
Reptile	Glyptemys insculpta	Wood Turtle	SC	2011
Dragonfly/Damselfly	Gomphus abbreviatus	Spine-crowned Clubtail	SC	2011
Dragonfly/Damselfly	Gomphus fraternus	Midland Clubtail	E	2014
Dragonfly/Damselfly	Gomphus quadricolor	Rapids Clubtail	E	2014
Dragonfly/Damselfly	Gomphus vastus	Cobra Clubtail	SC	2014

Taxonomic Group	ScientificName	CommonName	State Status*	Most Recent Observation
Dragonfly/Damselfly	Gomphus ventricosus	Skillet Clubtail	T	2014
Bird	Haliaeetus leucocephalus	Bald Eagle	T	2015
Butterfly/Moth	Hemaris gracilis	Slender Clearwing Sphinx	SC	2001
Butterfly/Moth	Hemileuca maia	Barrens Buckmoth	SC	2013
Mussel	Lampsilis cariosa	Yellow Lampmussel	E	1987
Fish	Lota lota	Burbot	SC	2009
Butterfly/Moth	Metarranthia apiciaria	Barrens Metarranthia	E	1974
Dragonfly/Damselfly	Neurocordulia yamaskanensis	Stygian Shadowdragon	SC	2014
Dragonfly/Damselfly	Ophiogomphus aspersus	Brook Snaketail	SC	2005
Bird	Poocetes gramineus	Vesper Sparrow	T	1999
Butterfly/Moth	Psectraglaea cariosa	Pink Sallow Moth	SC	2013
Dragonfly/Damselfly	Rhionaeschna mutata	Spatdock Darner	SC	2006
Butterfly/Moth	Satyrus favonius	Oak Hairstreak	SC	1992
Mammal	Sorex palustris	Water Shrew	SC	1970
Butterfly/Moth	Speranza exonerata	Pine Barrens Speranza	SC	2013
Mussel	Strophitus undulatus	Creeper	SC	1978
Dragonfly/Damselfly	Stylurus amnicola	Riverine Clubtail	E	2005
Reptile	Terrapene carolina	Eastern Box Turtle	SC	2015
Butterfly/Moth	Zale lunifera	Pine Barrens Zale	SC	2013
Butterfly/Moth	Zanclognatha martha	Pine Barrens Zanclognatha	T	2013

* SC = Special Concern; T = Threatened; E = Endangered.

Source: Natural Heritage and Endangered Species Program, Mass. Division of Fisheries and Wildlife, 2009, <http://www.mass.gov/dfwele/dfw/nhesp/nhesp.htm>.

The good news is that several species that were once extirpated from Montague thrive here today, including the bald eagle, wild turkey, beaver and moose. With conservation of remaining wildlife and restoration efforts, Montague's diversity of wildlife can be maintained, and populations of rare species stabilized, and hopefully increased over time.

E.4 Conserving Montague's Biodiversity

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 ignore 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 food. If land within Montague is 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.

The Nature Conservancy (TNC) released a report in 2013 entitled “Resilient Sites for Terrestrial Conservation in the Northeast and Mid-Atlantic Region.”³⁸ According to the Introduction of the TNC report, climate change is expected to alter species distributions. As species move to adjust to changing conditions, federal, state and local agencies and entities involved in land conservation need a way to prioritize strategic land conservation that will conserve the maximum amount of biological diversity despite shifting species distribution patterns. Current conservation approaches based on species locations or on predicted species’ responses to climate, are necessary, but hampered by uncertainty. TNC states that it offers a complementary approach, one that aims to identify key areas for conservation based on land characteristics that increase diversity and resilience. The central idea of this project is that by mapping key landscapes and evaluating them for characteristics that buffer against climate effects, conservationists can identify the most resilient places in the landscape.

The Nature Conservancy’s resilience analysis aims to identify the most resilient examples of key landscapes to provide conservationists with locations where conservation is most likely to succeed over centuries. The Massachusetts Division of Conservation Services’ Landscape Partnership Grant Program, which seeks to preserve large, unfragmented, high-value conservation landscapes, including working forests and farms of at least 500 acres in size, specifically references the TNC report and mapping.³⁹ The *BioMap2* project, discussed above, and The Nature Conservancy’s resiliency mapping are two resources that can be consulted when working to prioritize conservation for species diversity and health.

Conservation strategies for the Town to consider include the protection of core habitat and critical natural landscapes as identified by *BioMap2*; the continued protection and linkage of large blocks of contiguous forestland; the retention of early successional habitats like fields and grasslands; the protection of vernal pools, wetlands, and riparian corridors that sustain the greatest diversity of life in Montague, and the restoration of resources damaged by use, development or natural events, such as eroded riverbanks.

F. FAVORITE PLACES: SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

This section identifies the scenic resources and unique environments that most Montague residents would agree represent the essence of Montague’s character. In many ways the history of Montague—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. Some of the town’s most scenic views include old farm buildings, fields cleared long ago

³⁸<https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/Pages/default.aspx>

³⁹<http://www.mass.gov/eea/grants-and-tech-assistance/grants-and-loans/dcs/grant-programs/landscape-partnershipprogram.html>

and undeveloped hillsides. Historic homes, meeting halls and churches provide us with a sense of our culture and the work of our ancestors and predecessors.

The unique environments in Montague 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 an inventory of scenic resources and unique natural environments in Montague is to provide a basis for setting resource protection priorities. To this end, the following section includes information about the different values associated with each scenic resource and natural environment, and indicates areas where multiple values are represented in one landscape. Those landscapes that contain, for example, scenic, wildlife and cultural values may be given higher priority for protection than a landscape that contains only one value.

These documented resources include historic landscapes and special places. The following 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).

Table 4-6 lists significant scenic, historic, recreational and ecological landscapes in Montague. This table is just one way to express the multitude of special places in the town. Recognizing that individual residents have their own favorite places in Montague, this plan also incorporates drawings completed by Montague schoolchildren during February vacation week in 2017. Children were invited to draw pictures of their favorite place in Town at an event sponsored by the Town of Montague, Turners Falls RiverCulture, the Great Falls Discovery Center, and the Gill-Montague Community School Partnership. Drawings were displayed as part of the "Favorite Places in Montague" exhibit in the Great Hall of the Great Falls Discovery Center in March and April. Selections from these drawings are printed on the front and back covers of the plan, on chapter covers, and interspersed throughout the text.

Table 4-6: Scenic Resources and Unique Environments

MAP #	SCENIC RESOURCES	ECOLOGICAL/ GEOLOGICAL RESOURCES	RECREATIONAL VALUE	HISTORICAL VALUE
<i>Stream Corridors</i>				
1	Connecticut River	Yes	Yes	Yes
2	Millers River	Yes	Yes	Yes
3	Sawmill River	Yes	Yes	Yes
4	Pond Brook	Yes	Yes	
5	Goddard Brook	Yes	Yes	
6	Spaulding Brook	Yes	Yes	Yes
7	Chestnut Hill Brook	Yes		
8	Cranberry Pond Brook	Very High-Floodplain Forest		
9	Hannegan Brook	Very High-Recharge Area for Lake Pleasant		
10	Lyons Brook	Yes	Yes-Falls	
<i>Ponds and Lakes</i>				
11	Lake Pleasant	Yes		Yes
12	Green Pond	Yes		Yes
13	Podlenski's Pond/MassWildlife	Yes		
<i>Wetlands</i>				
14	Catamount Swamp (shared with Wendell)	Yes		
15	Richardson Road Beaver Pond (shared with Leverett)	Yes		
16	Plains Kettle holes	Yes		
17	Vernal Pools	Yes		
<i>State Managed Conservation Areas</i>				
18	Montague State Forest	Yes	Yes	Yes
19	Montague Wildlife Management Area	Yes	Yes	
20	Montague Plains Wildlife Management Area	Yes	Yes	
21	Connecticut River Greenway State Park	Yes		
<i>Historical Agricultural Landscapes</i>				
22	Connecticut River Scenic Byway along Route 63 / 47			Yes
23	Along Greenfield Road			Yes
24	Along Chestnut Hill Road			Yes
25	Along Chestnut Hill Loop			Yes
26	Along Ferry and Meadow Roads	Yes		Yes
27	Wendell Road / East Chestnut Hill Road via Wendell			Yes
<i>Historic Village Centers</i>				
28	Montague Center; Village Center			Yes
29	Turners Falls Village Center			Yes

MAP #	SCENIC RESOURCES	ECOLOGICAL/ GEOLOGICAL RESOURCES	RECREATIONAL VALUE	HISTORICAL VALUE
30	Millers Falls Village Center			Yes
31	Lake Pleasant Village			Yes
<i>Industrial Landscape</i>				
32	Turners Falls Dam			Yes
33	Turners Falls Power Canal			Yes
34	Turners Falls-Gill Bridge			Yes
35	Montague Mill (Book Mill) on Sawmill River			Yes
<i>Unusual Geologic Features</i>				
36	Deep Hole (Connecticut River)	Yes	Yes	
37	King Phillip's Abyss (Connecticut River)	Yes	Yes	
38	Bartons Cove (Connecticut River)	Yes	Yes	
39	Rock Falls (Connecticut River)	Yes		
<i>Unusual Natural Communities</i>				
20	Montague Plains Pitch Pine /Scrub Oak Barrens	Yes	Yes	Yes
<i>Scenic Views</i>				
40	South from CT River			
41	South from East Taylor Rd.			
42	West from Montague WMA			
43	West from Dry Hill Rd.			
44	Northeast from Lake Pleasant Rd.			
45	Northeast from East Mineral Hill			
46	Northeast from Carlisle Avenue			
47	East from Unity Park			
48	South from the Montague/Gill Bridge			
<i>Other Recreational Resources</i>				
49	North Street (Sawmill River) Conservation Area	Yes	Yes	
50	Poplar Street Canoe Access		Yes	
51	Unity Park		Yes	
52	Highland Park		Yes	
53	Norma's Park		Yes	
54	Rutter's Park		Yes	
55	Montague Center Park		Yes	
56	Canalside Trail Bike Path	Yes	Yes	Yes
57	Great Falls Discovery Center	Yes	Yes	Yes
58	Turners Falls Fish Ladder Viewing	Yes	Yes	
59	Peskeomskut Park		Yes	
60	Dry Hill / Chestnut Hill Conservation Area	Yes	Yes	
61	Cabot Camp		Yes	Yes

Note: TFFD= Turners Falls Fire District; WMA=Wildlife Management Area

G. ENVIRONMENTAL CHALLENGES

G.1. Urban Blight

Public outreach for previous Montague Open Space and Recreation Plans identified urban blight in Turners Falls and Millers Falls as serious problems, as well as the need to redevelop the “Rod Shop” area in Montague City. In 2014, the Historic Industrial District in Turners Falls and the central village of Millers Falls were designated as “slum and blighted” after inventories of the buildings and public infrastructure identified significant physical deterioration, vacancy or abandonment, and low property values in these areas. The designation allows the Town to apply for funding critical to the revitalization of both areas, including implementing a façade and signage improvement program, infrastructure improvements, housing rehabilitation and other activities that support neighborhood revitalization.⁴⁰

The 2013 Downtown Turners Falls Livability Plan identified the Town’s redevelopment priorities in Turners Falls, which include the Strathmore Mill Complex, R.R. Salvage, 38 Avenue A (former Cumberland Farms), Saint Anne’s Church (26 Sixth Street), and the rear addition to the Town Hall. The plan also listed a number of vacant storefronts in downtown, some due to maintenance issues and an absentee landlord. According to the plan, one of the ongoing challenges to redevelopment in Turners Falls is “a legacy of wonderful historic structures, but also the economic reality of rental rates that don’t cover the cost of renovations.”

The Town of Montague has an active downtown revitalization program to address the problem of urban blight in downtown areas. The Crocker Bank and Cutlery Buildings in downtown Turners Falls were fully renovated in 2001-2002, and renovation of the historic Colle Opera House was completed in 2003. In 2015, the town stimulated \$3,000,000 of private investment into the preservation and productive reuse of vacant historic properties in Montague through the Commercial Homesteading Program. In Millers Falls, 26-28, 30, and 34 East Main Street now host a mix of uses including a laundromat, a construction company headquarters, a restaurant space, and 7 residential units. The former Montague Center School building is being converted to 22 high-end residential units. The Town is currently working with a developer on Strathmore Mill Building #11 into a mixed-use project with \$2.3 million in private investment.

Efforts have also been undertaken in recent years to reconstruct the streetscape in downtown Millers Falls and to restore privately-owned façades in Turners Falls and Millers Falls. In 2015 the Planning Department secured a \$384,000 Community Development Block Grant to replace 33 downtown streetscape lights to new LED fixtures and install a pedestrian gathering area with a safer pedestrian crossing at the downtown’s main intersection of Avenue A and 3rd Street. The Town has been awarded funding for a second phase to extend streetscape lighting from 5th street to 7th street and within Peskeomskut Park. These were action items identified in

⁴⁰ *Slum and Blight Inventory for the Millers Falls Village Center; Slum and Blight Inventory for the Turners Falls Historical-Industrial District.* Franklin Regional Council of Governments. December 2014.

the 2013 Downtown Turners Falls Livability Plan. Town Meeting has approved zoning changes for both villages designed to encourage pedestrian-oriented commercial development.

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 urban villages. The Town has worked with the Franklin Regional Council of Governments to assess the extent of pollution at a number of industrial sites in Montague’s villages.

The success of efforts to address urban blight and promote revitalization in urban areas is critical to the future of the town’s open space and natural resources. Montague’s villages have many natural and cultural resources that make them attractive places to live: historic buildings, a mix of residential and commercial spaces, parks, proximity to rivers and forests. Improving infrastructure and the quality of life in the villages can help draw people to these historic settlements, and possibly reduce some of the pressure to develop more rural areas of town.

G.2. Lack of Safe Swimming Areas

The Connecticut River surrounds Montague to the north and west and represents the single largest body of water in Montague. Unfortunately, while there are many areas in Town that look like good places to swim, legal and safety considerations put swimmers at risk of breaking the law or serious injury at every one of them. The lack of a safe public swimming area is a very common complaint among Montague residents. Developing an outdoor swimming facility was identified by 42% of respondents to the 2016 Montague Open Space and Recreation Survey as a top recreation priority for the Town. In response, the Montague Recreation Commission has established a sub-committee to re-examine outdoor swimming opportunities in town.

In 1998, two teenage boys drowned while swimming in the “Rock Dam” area of the Connecticut River in Montague City. The fact that the boys had been warned repeatedly and recently about the extreme danger of swimming in that specific location sent a message to many Town residents that the only way to stop teens from swimming in dangerous locations would be to provide them with a safe place to swim. Toward this end, the Board of Selectmen appointed a committee of residents, town employees and a representative of Northeast Utilities (now FirstLight Power) to investigate options for public swimming areas.

The group evaluated the potential of virtually every water body in town. Possibilities discussed included:

- Three sites along the Connecticut River:
 - The grassy area southeast of the old bridge abutment across from Unity Park
 - The Turners Falls Rod & Gun Club
 - The “Rock Dam” in Cabot Woods
- Lake Pleasant
- Green Pond

- The Sawmill River where it runs through the North Street Wildlife Management Area in Montague Center
- Clapp's Pond north of Swamp Road
- The existing non-functional pool at the Thomas Memorial Golf Course

The "Rock Dam" site was unanimously rejected as being unsafe. There was strong interest in the other Connecticut River sites, both of which are owned by FirstLight Power. The company does not permit swimming on its property, maintaining that unpredictable changes in volume and flow along the entire reach of the river in Montague make it unsafe for swimmers. The Turners Falls Rod & Gun club leases its site from FirstLight and is not interested in opening the property up for public swimming even if the company would permit it.

There was also very strong interest in Lake Pleasant and Green Pond, both of which are owned by the Turners Falls Water District. There was consensus that Lake Pleasant would be an ideal public swimming area; and many older residents of the Town have fond memories of swimming in Green Pond. The Lake was the Town's main source of drinking water until 1994 when changes in drinking water regulations required filtering. There is a hydrologic connection between the lake and the pond, and both are currently designated as backup drinking water supplies. State regulations unequivocally prohibit swimming.

The group investigated the possibility of abandoning Lake Pleasant and/or Green Pond as drinking water supplies so that they could be used for swimming. Massachusetts regulations state that:

No supplier of water may remove a public water system source from service or abandon a public water system source without the prior written approval of the Department [of Environmental Protection]. The Department will not approve any such action unless the supplier of water demonstrates to the Department's satisfaction that such action will have no significant adverse impact upon the supplier of water's present and future ability to provide continuous adequate service to consumers under routine and emergency operating conditions, including emergencies concerning the contamination of sources of supply, failure of the distribution system and shortage of supply. [310 CMR 22.25]

In addition, a 2/3 vote of the Massachusetts Legislature may be required to transfer or change the use of land acquired for water supply purposes. The Turners Falls Fire District believes that filtration of Lake Pleasant will be the most cost-effective and practical option to meet the Town's future water needs. The Water Commissioners have been consistently opposed to the abandonment of either the lake or the pond as water supplies for the sake of creating a swimming area.

The Sawmill River sites in the North Street Wildlife Management Area are owned by the State Division of Fisheries and Wildlife, which prohibits swimming on its property.

Clapp's Pond is privately owned and the owners are not interested in selling the property to the Town at this time.

With no consensus on whether, where and how to create a safe outdoor swimming facility in the Town of Montague, residents continue to swim illegally, and to rely on swimming facilities in other towns, including the Greenfield municipal swimming area on the Green River, Lake Wyola in Shutesbury and Laurel Lake in Erving. The Montague Parks & Recreation Department provides weekly trips to Laurel Lake through its Summer Playground Program (ages 5 - 12). Children must be registered through this program to take advantage of this opportunity. A better solution is still needed for teens and adults, as well as low-income residents who cannot pay the fees for the trips or afford to travel out of town on their own.

Limited access for boating is another frequent complaint of residents. The only public boat access in town is the Poplar Street canoe access, owned by FirstLight Power and leased by the Department of Conservation and Recreation (DCR). This site is too steep for many seniors and residents who enjoy canoeing but have limited mobility. The Town of Montague has requested improvements to the Poplar Street boat access as part of the FERC relicensing process for FirstLight Power. The Town has also requested development of river access points below the Turners Falls Dam, at Unity Park, at the Rock Dam, and at Cabot Camp.

G.3 Montague Plains

Guiding the future of the Montague Plains was another one of the four major planning challenges identified in the 1999 Comprehensive Plan. Residents appreciate trails and wildlife habitat on the Montague Plains. Fifty-two percent of residents surveyed for the Open Space & Recreation Plan in 2016 take advantage of the recreational opportunities offered by the Plains. Problems associated with the Plains include rampant illegal dumping, noise and erosion caused by all-terrain vehicles, and the lack of parking. Both major landowners on the Plains—the Massachusetts Department of Fish and Wildlife and Suez Energy—prohibit use of their property by ATVs. There is also some concern about safety issues caused by hunting in proximity to residences.

Since a large section of the Plains was purchased by the Commonwealth in 1999, the state has made an effort to discourage illegal dumping and ATV use by blocking roads. However, due to the size of the Plains Wildlife Management Area and state budget cuts, it is not possible for the state to monitor the entire area effectively. One strategy to address the persistent problems in the area would be to form a “Friends of the Montague Plains” group to do regular patrols, organize cleanups, volunteer to help with restoration, and educate other residents about the unique ecology and beauty of the Plains.

G.4. Chronic Flooding, Erosion, and Sedimentation

According to the 2014 Montague Local Natural Hazards Mitigation Plan, landowners on the northwest side of Montague City Road have experienced high groundwater and periodic flooding, which Town officials have attributed to seepage from the Turners Falls Power Canal. In response to concerns expressed by the Town, the Federal Energy Regulatory Commission commissioned a review of the structural integrity of the canal's left embankment in 2000, which determined that the integrity of the canal was sound and that the elevated groundwater levels and periodic flooding are likely due to the growing beaver population.

The 2014 Montague Multi-Hazard Mitigation Plan identifies the following areas as prone to chronic flooding:

- Montague Center at the junction of the Sawmill and Connecticut Rivers
- Montague City Road, between the road and the power canal
- Franklin County Technical School ballfields and driveway
- Meadow Road, adjacent to the Connecticut River
- Hillcrest School, due to frozen dry wells

The plan also recommends mapping Fluvial Erosion Hazard (FEH) zones, which are areas along rivers and streams that are susceptible to bank erosion caused by flash flooding, and seek to limit new development in these areas. Rivers and streams alter their course by erosion of their banks and the deposition of sediments. This natural process can be accelerated and exacerbated by human activities that increase stormwater runoff, alter river banks and vegetation, and impact aquatic and riparian habitat. Valuable farmland, property, and infrastructure can be threatened by eroding river banks. In addition to property and infrastructure damage, sediment from eroding banks can compromise habitat for fish and aquatic life.

G.5. Forestry Issues

As discussed previously, the Montague Plains is the largest inland Pitch-Pine Scrub Oak (PPSO) community in southern New England, and the only large remnant of this ecosystem in the Connecticut River Valley. Pitch pine-scrub oak barrens are maintained by fire, which increases the rate of cycling of nutrients to the soil. Without disturbance by fire, tree-sized oaks and white pine can take over. Over the past 16 years, the Massachusetts Division of Fisheries and Wildlife (MassWildlife) has used a combination of tree harvesting, shrub mowing, and prescribed burning to benefit rare species and to reduce the risk of a catastrophic wildfire. MassWildlife has cooperative agreements with the Massachusetts Department of Conservation and Recreation and the Town of Montague Conservation Commission to restore sandplain habitats on their inholdings within the WMA, and works closely with local fire departments and the DCR Bureau of Fire Control to ensure that firefighters have adequate access in the event of a wildfire and are familiar with the changes in vegetation and fuels resulting from habitat management activities.

In 2015, a climate change adaptation analysis identified management goals, objectives, and tools for the sandplain natural communities at the Montague Plains WMA. The analysis assessed potential broad-scale climate change impacts and vulnerabilities, evaluated management objectives in the light of these impacts and vulnerabilities, identified adaptation approaches and tactics for implementation, and proposed criteria for monitoring the effectiveness of implemented actions. According to MassWildlife, this analysis and its implementation are being integrated into an updated habitat management plan for the WMA.⁴¹

According to the *Massachusetts Climate Change Adaptation Report*, climate change impacts to New England forests could include changes in forest structure, more frequent droughts associated with forest fires, and invasive insects and diseases. Hemlock pests may have significant consequences for Montague's forests, especially in the wooded ravines and wetlands. The hemlock wooly adelgid is killing virtually all hemlocks in PA, NY, NJ, and CT. According to experts at Smith College, the wooly adelgid came up from Connecticut into the Springfield area in the early 1990s. Since then it has extended its range north, and the limit of its cold hardiness is likely to be farther north than Montague. Another threat to the hemlocks has been the hemlock looper, which has killed over 1,000 acres of hemlock in Franklin County. Other potential threats to Montague's forests include the Asian Longhorned Beetle, an invasive wood-boring insect that attacks hardwood trees, including maple, birch and elm, and the Emerald Ash Borer, a non-native invasive insect that attacks ash trees. Both pests have been confirmed in Massachusetts and are being monitored to avoid further spreading.

While active management is not suitable for all lands, sustainable forestry can increase resilience to climate change through improving wildlife habitats, eliminating invasive species, helping to control the spread of disease, and increasing the ability of forests to store carbon.⁴² Sustainable forestry means keeping forests healthy, dynamic, and available for future generations. It addresses all of the resources provided by forests, including habitat, clean water and air, recreation, timber, jobs, and scenic beauty, and seeks to keep viable all of these options and opportunities.⁴³ Challenges to practicing sustainable forestry in Montague and the greater region include:

- a lack of local markets for low-grade wood, which would make sustainable long-term management more financially feasible;
- the need for assistance for local loggers and sawmills to upgrade equipment, cover insurance and energy costs, and meet regulations; and
- the need to educate landowners and the public about the benefits of working forests and sustainable active forest management.

⁴¹ "Background information on Montague Plains Wildlife Management Area," by the Division of Fisheries and Wildlife, habitat site walk and information session held in Montague on September 29, 2016.

⁴² Hines, S.J.; Daniels, A. 2011. Private Forestland Stewardship. (October 10, 2011). U.S. Department of Agriculture, Forest Service, Climate Change Resource Center. www.fs.usda.gov/ccrc/topics/forest-stewardship/.

⁴³ What is Sustainable Forestry? Peter J. Smallidge, NYS Extension Forester, Cornell Forestry Extension Program.

G.6. Public Shade Trees

A public tree inventory was completed for downtown Turners Falls in 2015. A total of 441 shade trees were inventoried. The study concluded that the trees in the project area provide an estimated \$46,800 in annual benefits, and that overall the trees are in good condition and well-maintained. Potential issues identified include a lack of species diversity, which can lead to increased vulnerability to disease. In particular, a number of streets in downtown have clusters of only one species, making these streets susceptible to loss of multiple trees at once. Avenue A is lined with white ash trees along its western side. The Emerald Ash Borer, a non-native insect that attacks ash trees, has been found in Berkshire County and towns in Hamden and Worcester County. At this time it has not been found in Franklin County. Another potential threat to Montague's public shade trees is the Asian Longhorned Beetle, which attacks hardwood trees. In 2008 an infestation was found in Worcester. To eradicate it, numerous public shade trees had to be removed, drastically altering the character of many neighborhoods.

G.7. New Development

New development can have negative impacts on open space, such as contributing to habitat and landscape fragmentation, and serving as a source of sediment run-off and other non-point source pollution. Agricultural land along existing roads in town is particularly vulnerable to development. Fragmenting farmland with development can make it more difficult to farm the remaining parcels. Similarly, new development within forested areas can make it more difficult to conduct forestry activities, and contributes to fragmentation of large contiguous areas of forest that are necessary for certain types of wildlife to thrive. These impacts can be minimized by balancing new development with resource protection. The Montague Planning Board is currently considering an open space residential bylaw that would allow for flexible lot sizes in conjunction with the permanent protection of open space in new subdivisions.

G.8. Environmental Equity

Environmental Equity means taking a look at conservation and recreation opportunities available in the town and determining if there are areas of the town that seem to be lacking resources. As discussed in Section 3, Montague has a high rate of poverty, particularly in Turners Falls and Millers Falls. Residents may be unable to afford recreational opportunities that require a fee, and may lack transportation to open space and recreation resources in other areas of Town. It is therefore important to ensure free access to an adequate amount of well-maintained open space and recreational resources within walking distance of homes in these areas.

G.9 Other Environmental Challenges

Wildlife Habitat

Residents who participated in the Open Space & Recreation Planning process value the abundance of wildlife habitat in Montague and are concerned about the threats posed by development. Specific areas of concern identified during the village meetings include the vernal pools north of Green Pond and the forested area east of Route 63.

Dry Hill

Residents identified several problems in the Dry Hill region of Town. There is some concern that recent residential development at higher altitudes is causing erosion. Above the existing houses, the road is in extremely poor condition. It is severely eroded and impassible in sections. Access to the historic town cemetery at the north end of the road needs to be restored. The Town should carefully consider the future of Dry Hill Road. Continued development in this area has the potential to fragment large blocks of forest and may result in costly expenditures on infrastructure and road maintenance. If repair of the deteriorated sections of the road to standards required for general use is determined to be too costly, the Town should consider stabilizing eroding areas and formally abandoning the road.

Sawmill River Watershed

As discussed previously, erosion and sedimentation, invasive plant species, and barriers to fish passage are important problems in the Sawmill River Watershed.

Connecticut River

Streambank erosion is also an important ongoing issue for the Connecticut River, especially in the “Turners Falls Pool,” which encompasses the length of the river from the Northfield Mountain Pumped Storage Facility to the Turners Falls Dam. Erosion is discussed in more detail in Section 7-Analysis of Needs. In addition, fish passage at the Turners Falls fishway continues to be an issue for migratory fish. As noted previously in this section, passage rates at the fishway for American Shad are far below the established minimum goal of passing at least 40% of the fish that pass the Holyoke Dam.

The “Burn Dump” off Turnpike Road

An abandoned dump site, located off Turnpike Road, still needs to be capped even though the landfill nearby was properly closed in the 1990s. The Town is currently in the design and permitting phase for the cap, and plans to put the project out to bid in 2017. A 6.4 MW solar project has been proposed for the Burn Dump and the currently capped landfill. The dump site is located upstream of a tributary to the Connecticut River. It is therefore important to monitor any water draining from this site for potential contaminants.

Illegal Dumping

Illegal dumping is a noted concern in some of Montague’s most environmentally sensitive lands including the Montague Plains and on banks of the Connecticut and Millers Rivers. Typically,

the sites are cleaned annually by the Connecticut River Watershed Council. These locations are mostly on public lands, but are owned by different entities. These lands require increased stewardship and management.

Hazardous Waste and Brownfield Sites

As defined by the U.S. Environmental Protection Agency (EPA), "brownfields" are properties that the expansion, redevelopment, or reuse of may be complicated by the actual presence or perceived potential presence of a hazardous substance, pollutant, or contaminant. Montague has been working with the Franklin Regional Council of Governments and property owners to assess the extent of contamination and promote industrial or commercial redevelopment of identified brownfield sites in Town.

The Massachusetts Department of Environmental Protection (DEP) maintains a list of brownfield sites where known contamination has occurred. In Montague, 49 sites have been reported to the DEP as of November 2016, most of which have either been cleaned up or determined to pose no significant risk to public health.⁴⁴

⁴⁴ The full list of sites can be found by searching the DEP database at <http://db.state.ma.us/dep/cleanup/sites/search.asp>.

Town of Montague

Open Space and Recreation Plan

Prime Farmland Soils & Geographic Features

March, 2016

Legend

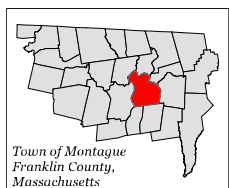
- Town Boundary
- Road
- Rail Line
- Wetlands
- Stream, River
- Pond, Lake
- River Protection Act
- Riverfront Area
- Open Space
 - Permanently Protected
- Slope
 - Slope > 25%
- Prime Farmland Soils



0 0.25 0.5 1 Miles



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS, and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



Town of Montague
Franklin County,
Massachusetts

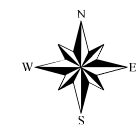
Town of Montague

Open Space and Recreation Plan

Water Resources

April 2017

- | | |
|---------------------|----------------------------------|
| Town Boundary | Wetlands |
| Road | Riverfront Area |
| Rail Line | Water Supply Protection District |
| Public Water Supply | Certified Vernal Pool |
| High Yield Aquifer | Low Yield Aquifer |
| Stream, River | Watershed Boundary |
| Pond, Lake | |

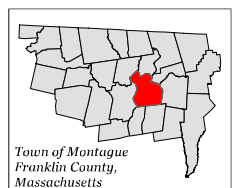


0 0.25 0.5 1 Miles



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.

"NHESP Certified Vernal Pools"



Town of Montague
Franklin County,
Massachusetts

Town of Montague

Open Space and Recreation Plan

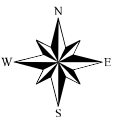
Plant and Wildlife Habitat

November, 2016

Legend

- | | |
|---------------|------------------------------------|
| Town Boundary | Priority Habitat of Rare Species |
| Road | BioMap Core Habitat |
| Rail Line | BioMap2 Critical Natural Landscape |
| Wetlands | Certified Vernal Pool |
| Stream, River | |
| Pond, Lake | |

Natural Heritage & Endangered Species Program

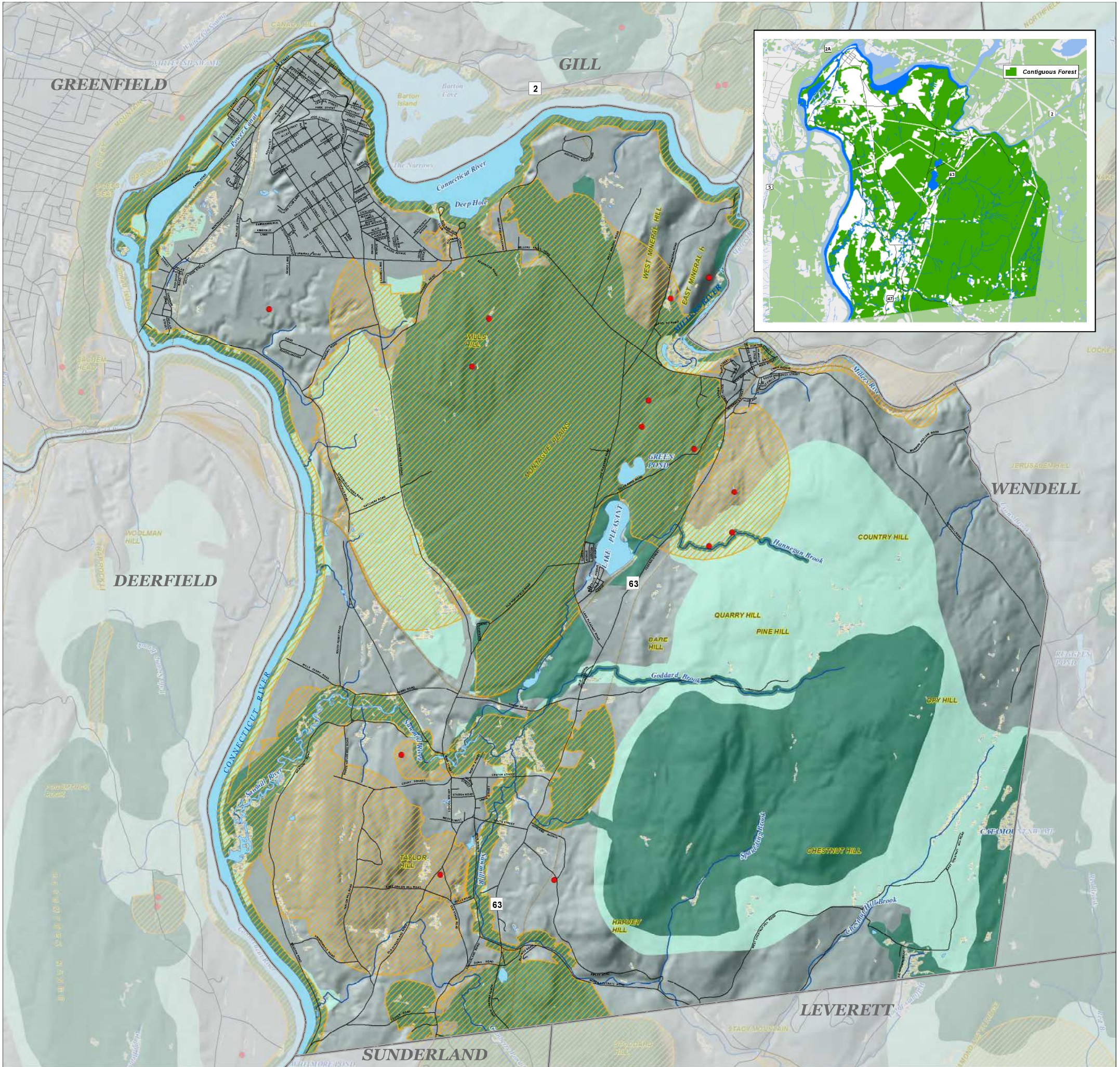
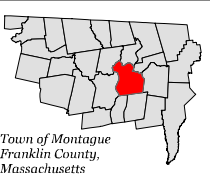


0 0.2 0.4 0.8 Miles

Franklin Regional Council of Governments

Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approx. made and are intended for planning purposes only, not to be used for survey.

"NHESP Priority Habitats of Rare Species"



Town of Montague

Open Space and Recreation Plan

Scenic Resources & Unique Environments

March, 2017

Legend

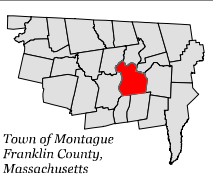
- Town Boundary
- Road
- Rail Line
- Wetlands
- Stream, River
- Pond, Lake

Open Space

- Permanently Protected
- Connecticut River Scenic Farm Byway & Mohawk Trail Scenic Byway Corridor
- Scenic View
- Scenic / Unique Point



0 0.25 0.5 1 Miles



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.

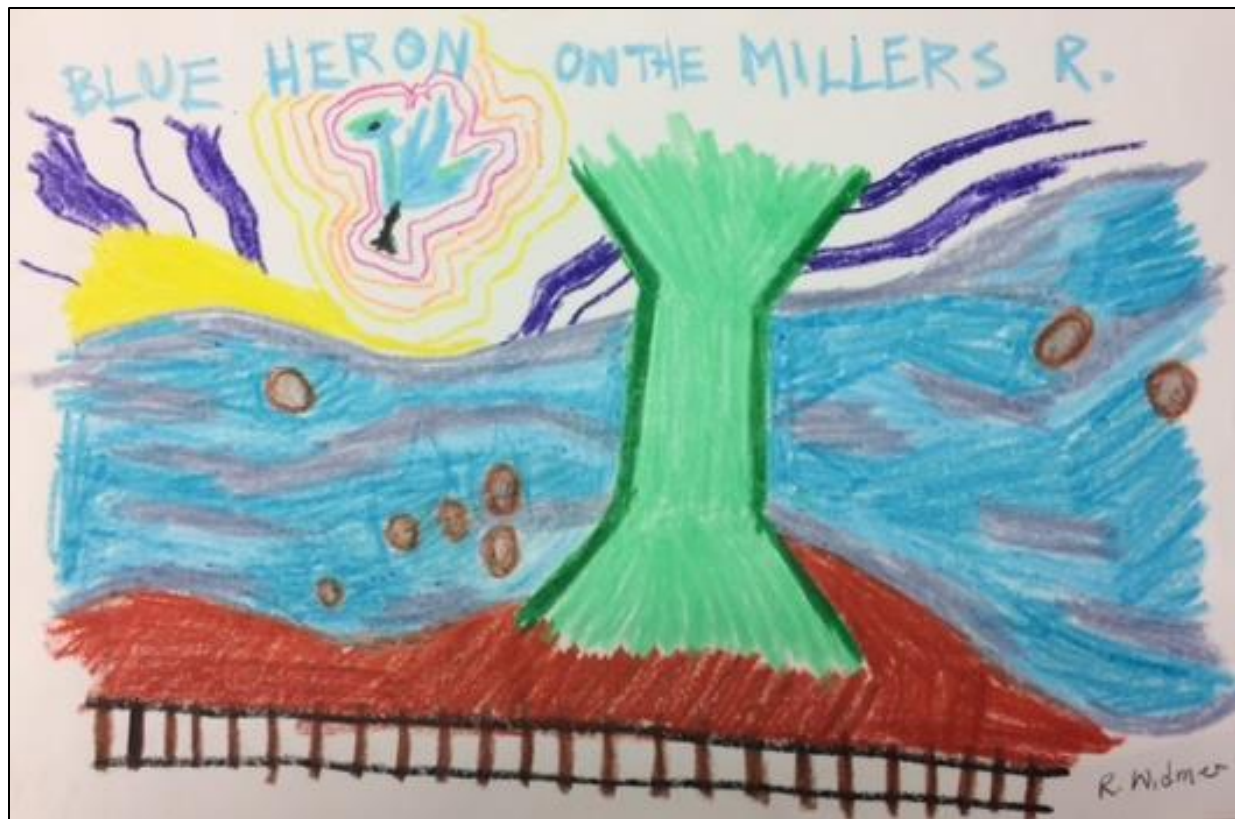


Scenic Resources

MAP #	SCENIC RESOURCES	ECOLOGICAL/ GEOLOGICAL RESOURCES	RECREATIONAL VALUE	HISTORICAL VALUE
Stream Corridors				
1	Connecticut River	Yes	Yes	Yes
2	Millers River	Yes	Yes	Yes
3	Sawmill River	Yes	Yes	Yes
4	Pond Brook	Yes	Yes	
5	Goddard Brook	Yes	Yes	
6	Spaulding Brook	Yes	Yes	Yes
7	Chestnut Hill Brook	Yes		
8	Cranberry Pond Brook	Very High- Floodplain Forest		
9	Hannegan Brook	Very High- Recharge Area for		
10	Lyons Brook	Yes	Yes-Falls	
Ponds and Lakes				
11	Lake Pleasant	Yes		Yes
12	Green Pond	Yes		Yes
13	Podlenski’s Pond/MassWildlife	Yes		
Wetlands				
14	Catamount Swamp (shared with Wendell)	Yes		
15	Richardson Road Beaver Pond (shared with Leverett)	Yes		
16	Plains Kettle holes	Yes		
17	Vernal Pools	Yes		
State Managed Conservation Areas				
18	Montague State Forest	Yes	Yes	Yes
19	Montague Wildlife Management Area	Yes	Yes	
20	Montague Plains Wildlife Management Area	Yes	Yes	
21	Connecticut River Greenway State Park	Yes	Yes	
Historical Agricultural Landscapes				
22	Connecticut River Scenic Byway along Route 63 / 47			Yes
23	Along Greenfield Road			Yes
24	Along Chestnut Hill Road			Yes
25	Along Chestnut Hill Loop			Yes
26	Along Ferry and Meadow Roads	Yes		Yes
27	Wendell Road / East Chestnut Hill Road via Wendell			Yes
Historic Village Centers				
28	Montague Center; Village Center			Yes
29	Turners Falls Village Center			Yes
30	Millers Falls Village Center			Yes
31	Lake Pleasant Village			Yes

MAP #	SCENIC RESOURCES	ECOLOGICAL/ GEOLOGICAL RESOURCES	RECREATIONAL VALUE	HISTORICAL VALUE
Industrial Landscape				
32	Turners Falls Dam			Yes
33	Turners Falls Power Canal			Yes
34	Turners Falls-Gill Bridge			Yes
35	Montague Mill (Book Mill) on Sawmill River			Yes
Unusual Geologic Features				
36	Deep Hole (Connecticut River)	Yes	Yes	
37	King Phillip’s Abyss (Connecticut River)	Yes	Yes	
38	Bartons Cove (Connecticut River)	Yes	Yes	
39	Rock Falls (Connecticut River)	Yes		
Unusual Natural Communities				
20	Montague Plains Pitch Pine /Scrub Oak Barrens	Yes	Yes	Yes
Scenic Views				
40	South from CT River			
41	South from East Taylor Rd.			
42	West from Montague WMA			
43	West from Dry Hill Rd.			
44	Northeast from Lake Pleasant Rd.			
45	Northeast from East Mineral Hill			
46	Northeast from Carlisle Avenue			
47	East from Unity Park			
48	South from the Montague/Gill Bridge			
Other Recreational Resources				
49	North Street (Sawmill River) Conservation Area	Yes	Yes	
50	Poplar Street Canoe Access		Yes	
51	Unity Park		Yes	
52	Highland Park		Yes	
53	Norma’s Park		Yes	
54	Rutter’s Park		Yes	
55	Montague Center Park		Yes	
56	Canalside Trail Bike Path	Yes	Yes	Yes
57	Great Falls Discovery Center	Yes	Yes	Yes
58	Turners Falls Fish Ladder Viewing	Yes	Yes	
59	Peskeomskut Park		Yes	
60	Dry Hill / Chestnut Hill Conservation Area	Yes	Yes	
61	Cabot Camp		Yes	Yes

SECTION 5: INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST



SECTION 5

*“Nature itself marked this patch of valley, surrounded by gorges and steep hills and myriad rushing streams as an especially desirable place in which to live”
(Pressey, 1910).*

INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Open space in Montague consists of farms, forests, parks and recreation areas under both public and private ownership and management. This section provides a summary of lands that provide open space, wildlife habitat, agricultural and forest products, watershed protection, scenic landscapes and recreational opportunities for Montague residents, as well as a map of open space with limited, temporary and permanent protection.

The inventory includes undeveloped land that provides an array of benefits to the community: actively-managed farm and forestland, wildlife habitat, protection and recharge of groundwater, public access to recreational land 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 air, surface and ground water, soil, vegetation, fisheries and wildlife. Recreational facilities can include open space, parks, and developed areas like tennis courts and swimming pools. Recreational facilities also include those that provide access to open space and natural resources, such as boat ramps and trails, or provide a means for active transportation, such as bike paths, bike lanes, and sidewalks. The inventory identifies the natural resource areas still in need of protection and suggests the types and ideal locations for additional recreational facilities. Open space protection is important because, as natural areas are fragmented and lost to development, the benefits these spaces provide to people, plants, and animals are diminished over time.

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. Permanent protection means that land 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, the local Conservation Commission or, in some cases, a

local water district, or attachment of a conservation restriction or similar legal mechanism to the deed.

Land is considered to be permanently protected from development when it is owned by the Commonwealth of Massachusetts and managed by a state conservation agency, including the Department of Fish and Game (DFG) or the Department of Conservation and Recreation (DCR). Land is also considered permanently 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. Land acquired by a public agency for the purpose of water supply protection is also considered to be permanently protected, as well as land dedicated to park and recreation purposes in its deed.

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. 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 development rights and attaches a restriction to the deed, which legally bars development, keeping land permanently available for agriculture.

Removing permanent protection from any parcel of land that is in the APR Program, protected with a conservation restriction, owned by a state conservation agency, a land trust or a town for conservation purposes, or acquired by a fire or water district for the purpose of water supply protection 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 are also considered to be permanently protected from development.

This "permanent 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 “permanent protection” status from open space in the Town of Montague.

Other land in Massachusetts owned by towns 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 ownership. In this case, converting a town forest to a soccer field or a school parking lot could be decided at Town Meeting.

Determining the status of lands owned by a municipal fire or water district is more complex. Land acquired for the specific purpose of protecting public water supplies has the same “Article 97” protection as land owned by state conservation agencies and land trusts and land protected by conservation restrictions. Such lands actually have an extra level of protection. In addition to requiring approval by two thirds of the State Legislature, the state Department of Environmental Protection must approve any conveyance, conversion or change of use of land acquired for protecting water supplies. Finally, any such change must be approved by a two-thirds vote at a special district meeting. Land owned by municipal fire and water districts and NOT acquired or necessary for the purpose of protecting public water supplies may not require the same process for conversion, conveyance or sale.

The two water districts in Montague own approximately 1,536 acres of land in Montague, most of which is owned and managed by the Turners Falls Water Department. This land was acquired over more than a century in dozens of separate transactions. From preliminary research conducted at the Franklin County Registry of Deeds for previous editions of this plan, it appears that a majority of the land was acquired by eminent domain for protection of public water supplies. While more research is needed to determine exactly which parcels of land can be considered to be permanently protected, it is assumed for the purposes of this plan that all lands in the watershed of Lake Pleasant, Green Pond, Hannegan Brook, and the recharge areas for the Turners Falls and Montague Center Wells are permanently protected.

Parcels enrolled in the three Massachusetts Chapter 61 tax abatement programs are temporarily protected from development. These programs offer 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 permanently. 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. Alternatively, the Town may assign this right to a non-profit land conservation organization.

Table 5-1 summarizes open space in Montague by ownership and level of protection from development. Approximately 60 percent or 12,097 acres of the total area of Montague (20,109 acres) is open space with some level of protection from development. Thirty nine percent, or 7,752 acres, of land in Montague is permanently protected from development. Thirty percent of permanently protected open space is publicly owned, and 9% is under private ownership. Since the last update of the Montague Open Space and Recreation Plan in 2010, roughly 523 additional acres have been permanently protected from development. Open space with limited protection comprises 7%, or 1,310 acres, of land in Montague. Three percent of open space under limited protection is privately owned, and 4% is publicly owned. Approximately 15% of land in Montague is temporarily protected through one of the Chapter 61 programs. Eight percent of land within town is enrolled in Chapter 61 (forestry), 7% of land in town is enrolled in Chapter 61A (agriculture) and 1% of land in town is enrolled in Chapter 61B (recreation).

Table 5-1: Summary of Protected Open Space by Ownership and Level of Protection

Level of Protection	Acres	Percent of Total Land in Montague (20,109 acres)
Permanently Protected Land		
Publicly-Owned		
State Department of Conservation and Recreation (DCR)	685	3%
State Department of Fish and Game (DFG)	3,785	19%
Montague Conservation Commission	6	0%
Turners Falls Fire District	1,512	8%
Montague Center Water District	24	0%
Public Cemeteries	5	0%
<i>Total Publicly-Owned</i>	<i>6,016</i>	<i>30%</i>
Privately-Owned		
Conservation Restrictions (CR)	686	3%
Agricultural Preservation Restrictions (APR)	992	5%
Private Cemeteries	58	0%
<i>Total Privately-Owned</i>	<i>1,736</i>	<i>9%</i>
TOTAL PERMANENTLY PROTECTED LAND	7,752	39%
Land Under Limited Protection		
Publicly-Owned		
Town of Montague	604	3%
Gill-Montague Regional School District	71	0%
Franklin County Technical School District	59	0%
Montague Economic Development Industrial Corporation	1	0%
United States Geological Survey	20	0%
<i>Total Publicly-Owned</i>	<i>754</i>	<i>4%</i>
Privately-Owned		
Utility land managed by Montague Parks & Recreation Dept.	4	0%
Utility land under FERC license	552	3%
<i>Total Privately-Owned</i>	<i>556</i>	<i>3%</i>
TOTAL LAND WITH LIMITED PROTECTION	1,310	7%
Temporarily Protected Land (privately-owned)		
Chapter 61	1,608	8%
Chapter 61A	1,312	7%
Chapter 61B	115	1%
TOTAL TEMPORARILY PROTECTED LAND	3,035	15%
TOTAL OPEN SPACE WITH SOME LEVEL OF PROTECTION	12,097	60%

Source: 2016, 2017 Montague Assessors' Office data with input from the Montague Town Planner, Conservation Commission, and Agricultural Commission.

Montague contains several large blocks of permanently protected land (see the Open Space Map at the end of this section). These areas include: State-owned land on the Montague Plains in the center of town; forest land owned by the Turners Falls Fire District surrounding Lake Pleasant, Green Pond, and the Hannegan Brook Watershed; much of Dry Hill and portions of Chestnut Hill and Harvey Hill in the forested, hilly eastern section of town; farmland and riparian areas along the Connecticut and Sawmill Rivers in the southwest section of town; and farm and forest land along East Mineral Road and West Mineral Road near the confluence of the Connecticut and Millers Rivers. Several of these areas combine with protected land in neighboring towns, contributing to regional open space corridors.

It is important to consider land protection on a regional scale beyond the borders of Montague for a number of reasons. Forests clean the air, filter water supplies, control floods and erosion, sustain biodiversity and genetic resources, provide wood products and recreation, and sequester carbon. It takes large, intact natural landscapes to sustain these benefits over the long term. These services have tremendous value, from supporting the local economy through forest product jobs, outdoor recreation, and farming, to performing functions that otherwise would need to be engineered by humans. For example, the Massachusetts Audubon Society has estimated that the nonmarket value of the natural areas within the State—for flood control, climate mitigation, and water filtration—is over \$6.3 billion annually. Boston is one of just four major U.S. cities approved by the EPA for unfiltered water supply systems, where forests do the work of cleaning the water.¹ When natural areas are fragmented and lost to development, these benefits are reduced over time.

Most recently, the Mount Grace Land Conservation Trust worked with landowners in Montague and Wendell through the Mormon Hollow Landscape Partnership project to permanently protect land along the borders of both towns, creating a link to large areas of conserved open space in each community. While much progress has been made in permanently protecting land in Montague, there are additional land protection needs in town. Montague's protection priorities continue to be prime farmland, riverfront areas, and contiguous forestland. Areas identified for continued protection efforts include:

- Prime farmland along the Connecticut and Sawmill Rivers in the southwest section of town. The easily developable soils and the relatively close commuting distance to Amherst make this area of town susceptible to residential development.

¹ "Partnership: Quabbin to Wachusett Grant Ranks Second in Nation." Mount Grace Land Conservation Trust. <http://www.mountgrace.org/partnership-quabbin-wachusett-grant-ranks-second-nation>

- Land along the Millers River. Most of the land along the Millers River is unprotected from development. Protecting the oxbow and Cabot Camp are two specific Town priorities.
- Forest land just east of Lake Pleasant and Green Pond. A corridor of protected open space currently extends from the Montague Plains east along Hannegan Brook and into Wendell. The protected area just east of Lake Pleasant is narrow and encompasses two railroad lines and Route 63. Enlarging this area of protected land would help promote a more viable corridor for wildlife and for hiking trails, and would protect the public drinking water supplies. Improvements for wildlife crossing should also be incorporated into road and railroad projects in this area.
- Mt. Grace Land Conservation Trust has identified a need to help smaller family-run farms with protecting their land. These farms may be too small for the APR program, but represent an important component of the regional farm and food system. The Town is interested in working with the land trust in this effort.

A. PRIVATELY OWNED OPEN SPACE

Approximately 44% of open space in Montague with some level of protection 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. As discussed in Section 3, this land requires few if any town services, generating a net tax gain for the Town. 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 leads to good stewardship.

The major disadvantage of private ownership of open space is that privately-owned land can be converted to other uses if not permanently protected. Permanently protected, privately owned land has increased since the 2010 Open Space and Recreation Plan, from 1,414 acres to 1,736 acres, which accounts for 9% of land in Montague. This increase suggests there is a growing interest among private landowners to protect their land. However, the remainder of privately owned open space is vulnerable to development.

Privately-Owned Farmland

Farmland, including farm woodlots, constitutes approximately 15% of the town's total land base, or 3,049 acres. Table 5-2 displays information on many of the town's farms, including

ownership, management, farm size, products for sale and whether public access is permitted. Montague's agricultural sector is diverse, encompassing farms that grow a wide variety of products.

Roughly 1,388 acres of farmland in Montague is permanently protected by the Agricultural Preservation Restriction (APR) Program, a Conservation Restriction or both. This is an increase from 2010 of approximately 161 acres. These restrictions are owned by the Massachusetts Department of Agricultural Resources (MDAR), the Massachusetts Department of Conservation and Recreation (DCR), the Town of Montague, a land trust, or a combination of these agencies. This protected land accounts for approximately 46% of all farmland in Town. Information on permanently protected farmland in Montague is included in Table 5-3.

Land enrolled in Chapter 61A is considered to be temporarily protected. Approximately 44% of Montague's farmland, including many large parcels with prime soils, falls into this category (see Table 5-5). In many cases, farmland enrolled in Chapter 61A abuts permanently 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.

Approximately 9% of farmland in Montague has no protection from development (see Table 5-5). This figure includes all land known to be used for agriculture in Town. Unprotected farmland abuts permanently protected farmland on East Mineral Road, Meadow Road and Route 47, and land enrolled in Chapter 61A on Turners Falls Road. Farmland along Taylor Hill and East Taylor Hill Road remains unprotected, while farmland along Route 63 is enrolled in Chapter 61A.

Table 5-2: Farms in Montague

Farm	Location	Landowner	Acres Owned	Assessors Map & Lot Numbers	Manager	Public Access	Products	Zoning	Level of Protection	Funds Used
	Hatchery Road	Robert & Lisa Adams	26	M 32, L 13, 15, 17			Berries, vegetables, asparagus	RS	Permanent	MDAR
	West Mineral Road	Robert & Karen Rice	96	M 18, L 5		None		AF-4	Permanent	DCR
	Main Street	Ted & Alice Armen	0.7	M 43, L 24		Limited	Saanen dairy goats, honey, Dominique chickens, vegetables	RS	None	Not applicable
Brooks' Bend Farm	Old Sunderland Road	Suzanne Webber	91	M 51, L 2, 12, 74	Al Miller, Suzanne Webber, Tyler Sage	Limited	Vegetables, nursery plants, hay, meat, wool, eggs	AF	Permanent and Chapter 61A	MDAR, Town of Montague
Bye/Fraser Farm	Taylor Hill Road	Daphne Bye & Mark Fraser	17	M 47, L 22	Daphne Bye & Mark Fraser	Limited	Irish Dexter beef, lamb, goats, poultry	AF-2	None	Not applicable
Cold Brook Farm	Greenfield Road	Frances Hemond	22	M 32, L 51, 81, 83		None	Nursery plants (at Turners Falls Farmers Market)	AF	Chapter 61A	Not applicable
Garbiel Farm	Greenfield Road, Meadow Road	Karl Garbiel	420	M 32, L 44; M 39, L 1, 4, 5, 35, 37, 47; M 41, L 24, 25, 26; M 42, L 6, 8, 9, 10, 13, 75; M 47, L 1, 2, 3, 12, 14, 20	Karl Garbiel	None	Hay, squash, cordwood	AF	Permanent and Chapter 61A	MDAR; Town of Montague; MA Dept. of Conservation & Recreation (DCR)
Gardner Farm	Turners Falls Road, Meadow Road	Gary Gardner	38	M 39, L 34, plus rented APR land		Farm stand	Vegetables, potatoes, eggs, hay, straw	AF	None	MDAR, USDA
Hunting Hills	Route 63	Suzanne Kretzenger, Trustee; Anne Kretzenger, Suzanne Kretzenger	51	M 49, L 1, 3, 6, 8	Suzanne Kretzenger	When open for business	Nursery plants, trees, hay	AF, AF-4	None	Not applicable
Jiang Farm	Federal Street, Center Street	Xin Miao Jiang, Kuo Shao Zhi	23.5	M 44, L 55, 56, 61	Family	None	Wholesale vegetables	RB	Chapter 61A	Not applicable
Mieczkowski Farm	Wills Ferry Road	Mieczyslaw Mieczkowski, Edward Mieczkowski	142	M 38, L 5, 8, 9; M 39 L 3, 43, 44, 45, 86; M 41, L 1, 11, plus rented land	Mieczyslaw Mieczkowski	None	Dairy farm, tobacco	AF	Permanent and Chapter 61A	MDAR; Town of Montague
Northeast Native Habitats / Sticky Business Apiary	Meadow Road	Melanie Gaier & Anthony Reiber	12	M 41, L 20, 38	Anthony Reiber; Melanie Gaier	None	Native perennial shrubs and trees; raw honey, beeswax, body care products; leases farmland to Riverland Farm	AF	Permanent	MDAR
Nourse Farms	Ferry Road	Nourse Realty LLC	123	M 32, L 71; M 38, L 1, 3, 4, 6; M 39, L 2, 89		None	Nursery plants, berries and vegetables at Whately location only	AF	Permanent and Chapter 61A	MDAR; Town of Montague
Old Homestead Farm	Route 63	Andrew & Kathy Peura	69	M 44, L 36; M 45, L 42; M 52, L 01; plus rented & other family land	Family	None	Berries, cordwood, lumber, maple syrup, pumpkins, horse boarding	AF-4	Chapter 61A and none	Not applicable
Patterson Farm	Greenfield Road, Rt 47, main loc. in Sunderland	Donald & Susan Patterson	159	M 26, L 44; M 51, L 13	Donald Patterson	None	Wholesale pumpkins, corn, peppers	AF	Permanent	MDAR; DCR
Peter Kretzenger	High Street	Peter & Joanne Kretzenger	0.5	M 6, L 192	Peter Kretzenger	None	Perennials, shrubs, fruits, vegetables at Great Falls Farmers Market	RS	None	Not applicable
Podlenski Farm	Route 47, Gunn Road	Stanley Podlenski Jr., Richard Podlenski, Frederick Podlenski	42	M 51, L 16, 17, 93	Richard Podlenski	Farm stand	Meat goats, hay, eggs, vegetables	AF, RB	None	Not applicable
Red Fire Farm	Meadow Road	Voiland Ryan Trustee, Voiland Sarah Trustee, 172 Meadow Road Nominee Trust	120	M 41, L 5, 19, 37; M 47, L 16	Ryan & Sarah Voiland	When open for business	CSA shares, organic vegetables and fruit	AF	Permanent	MDAR; DCR
Red Fire Farm/ Old Depot Gardens	Turners Falls Road	Paul & Jean Voiland	29	M 20, L 23; M 39, L 56	Ryan & Sarah Voiland	Farm stand	Vegetables, nursery plants, berries, honey,	AF	Permanent	MDAR

Farm	Location	Landowner	Acres Owned	Assessors Map & Lot Numbers	Manager	Public Access	Products	Zoning	Level of Protection	Funds Used
							maple syrup			
Ripley Farm	Ripley Road	Gary Billings, Janice Doyle	58	M 52, L 66, 68, 86, 87, 89		None	Maple syrup, Christmas trees	AF-4	Chapter 61A	Not applicable
D.A. Smiarowski Farms	Meadow Road	Daniel & Elizabeth Smiarowski	124	M 47, L 4, 5, 6, 7, 9, 27; M 50, L 1, 9, 10, 11, 12, 26		None	Asparagus, potatoes, pumpkins, squash, hay and straw	AF	Permanent	MDAR; Town of Montague; DCR
Leased to Red Fire Farm	Greenfield Road	Pamela Hanold	54	M 41, L 2, 28		None		AF	Permanent and Chapter 61A	MDAR; DCR
Waidlich Farm	East Mineral Road	Betty, Jon, Joanne, Michael, & Thomas Waidlich, & Jeanne Kozloski	238	M 18, L 10, 14; M 25, L 9	Jon Waidlich	Limited	Hay, corn, maple syrup	AF-4	Permanent	DCR
Watroba's Farm	West Street	Marilyn Watroba	94	M 48, L 8, 24, 57, 87, 88		None	Hay, horse boarding	AF-2	None	Not applicable
Xenophon Farm	Route 47	Janice & Elaine Kachavos	17	M 51, L 52, 53		When open for business	Horse boarding	AF	Chapter 61A	Not applicable
Yard Birds Farm	Greenfield Road	Brian Kline & Angela Roell	22	M 32, L 4, 6, 7	Brian Kline & Angela Roell	Limited	Bees, Honey, skin care products	AF	None	Not applicable
Total acres owned (does not include rented land)			2,089							

Source: Montague Agricultural Commission, Montague Assessors' Office, and Montague Planning Department.

Table 5-3: Permanently Protected Farmland in Montague

Map	Lot	Acres Protected	Type of Restriction	Landowner	Restriction Holder ²
32	13	5.7	APR	Adams, Robert & Lisa	MDAR
32	15	1.3	APR	Adams, Robert & Lisa	MGLCT
32	17	18.7	APR	Adams, Robert & Lisa	MGLCT
32	84	9.3	APR	Adams, Robert & Lisa	MDAR
48	144	15.6	APR	Ewell, Scott & Emily	MDAR
41	38	9.8	APR	Gaier, Melanie & Anthony Reiber	MDAR, Town
32	44	25.0	APR	Garbiel, Karl	MDAR, Town
39	35	82.9	APR	Garbiel, Karl	MDAR, Town
39	47	16.8	APR	Garbiel, Karl	MDAR, Town
39	1	19.3	APR	Garbiel, Karl	MDAR, Town
39	4	17.3	APR	Garbiel, Karl	MDAR, Town
41	24	6.7	APR	Garbiel, Karl	MDAR
41	25	1.2	APR	Garbiel, Karl	MDAR
47	1	42.2	APR & CR	Garbiel, Karl	MDAR, DCR
47	2	2.4	APR & CR	Garbiel, Karl	MDAR, DCR
47	3	26.0	APR & CR	Garbiel, Karl	MDAR, DCR, Town
18	6	47.9	CR	Gendron, Amanda & David	DCR
41	28	11.7	CR	Hanold, Pamela	DCR
38	8	14.9	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
38	9	31.5	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
39	3	27.5	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
39	43	2.3	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
39	44	14.3	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
39	45	12.8	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
41	1	21.6	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
41	11	3.7	APR	Mieczkowski, Mieczyslaw & Edward	MDAR, Town
42	2	6.0	APR	Mountain Research LLC	MDAR, Town
42	3	9.0	APR	Mountain Research LLC	MDAR, Town
42	7	2.1	APR	Mountain Research LLC	MDAR, Town
32	71	49.6	APR	Nourse Realty LLC	MDAR
38	3	10.6	APR	Nourse Realty LLC	MDAR, Town
26	44	81.8	APR, CR	Patterson, Donald	MDAR, DCR
51	13	29.2	APR	Patterson, Donald & Susan	MDAR
51	73	16.4	APR	Plavin, Amy F.	MDAR
18	5	96.0	CR	Rice, Robert & Karen	DCR
50	23	1.0	CR	Ross, Allen	DCR
50	2A	1.3	CR	Ross, Allen	DCR
32	85	3.0	APR	Shreve, Miriam Shannon	MGLCT
50	1	10.4	APR	Smiarowski, Daniel A.	MDAR
50	10	14.5	APR	Smiarowski, Daniel A.	MDAR, Town
50	11	5.7	APR	Smiarowski, Daniel A.	MDAR
50	12	4.7	APR	Smiarowski, Daniel A.	MDAR

² MDAR is Massachusetts Department of Agricultural Resources, DCR is Massachusetts Department of Conservation and Recreation, MGLCT is Mount Grace Land Conservation Trust, USDA is United States Department of Agriculture.

Map	Lot	Acres Protected	Type of Restriction	Landowner	Restriction Holder ²
50	9	1.6	APR	Smiarowski, Daniel A.	MDAR
47	4	4.5	APR & CR	Smiarowski, Daniel A. & Elizabeth A.	MDAR, DCR
47	5	27.3	APR & CR	Smiarowski, Daniel A. & Elizabeth A.	MDAR, DCR
47	6	5.3	APR & CR	Smiarowski, Daniel A. & Elizabeth A.	MDAR, DCR
47	7	44.0	APR	Smiarowski, Daniel A. & Elizabeth A.	MDAR
47	9	0.7	APR	Smiarowski, Daniel A. & Elizabeth A.	MDAR
47	27	5.2	APR	Smiarowski, Daniel A. & Elizabeth A.	MDAR
20	23	27.0	APR	Voiland, Paul & Jean	MDAR
41	5	47.1	APR & CR	Voiland, Ryan Trustee, Voiland, Sarah Trustee	MDAR, DCR
41	37	57.3	APR & CR	Voiland, Ryan Trustee, Voiland, Sarah Trustee	MDAR, DCR
47	16	13.9	APR	Voiland, Ryan Trustee, Voiland, Sarah Trustee	MDAR
18	14	47.3	CR	Waidlich, Joanne & J. Kozloski	DCR
18	10	112.5	CR	Waidlich, Betty, & Jon Waidlich	DCR
25	9	78.5	CR	Waidlich, Michael & Thomas	DCR
51	12	77.5	APR	Webber, Suzanne	MDAR, Town
51	74	9.2	APR	Webber, Suzanne	MDAR, Town
Total		1,388			

Source: Montague Assessors' Office, Montague Planning Department

Table 5-4: Agricultural Land Enrolled in Chapter 61A in Montague³

Map	Lot	Acres	Last Name	First Name	Zoning	Residence	Stream	Adj. To Cons. Land?
38	7	12.6	Beaubien	Mark	AF	N	Sawmill River	Y
42	1	19.6	Beaubien	Mark	AF	Y	N	N
52	66	35.0	Billings	Gary	AF-4	N	N	DFG
52	68	8.9	Billings	Gary	AF-4	N	N	N
52	86	4.5	Billings	Gary	AF-4	N	N	N
52	89	4.5	Billings	Gary	AF-4	N	N	N
47	22	16.9	Bye	Daphne	AF-2	Y	N	
41	32	3.0	Conner	William & Nancy	AF	N	N	Y (APR Farm)
42	80	6.8	Conner	William & Nancy	AF-2	Y	N	N
53	27	81.1	Coppinger	Lorna L. Trustee	AF-4	N	N	Y
53	28	25.3	Coppinger	Lorna L. Trustee	AF-4	Y	N	N
26	5	48.3	Dodge	Charles E. III	AF	N	N	N
52	70	9.3	Doherty	Michael	AF-4	N	N	
52	73	2.5	Doherty	Michael	AF-4	N	Y	
52	74	8.4	Doherty	Michael	AF-4	N	Y	
52	75	12.8	Doherty	Michael	AF-4	N	Y	
53	47	14.6	Doherty	Michael	AF-4	N	Y	

³ For information on zoning designations and districts, please see Appendix

Map	Lot	Acres	Last Name	First Name	Zoning	Residence	Stream	Adj. To Cons. Land?
39	46	5.8	Fronckus	Edwin & Francis Trustees	AF	N	Sawmill River	N
39	48	2.5	Fronckus	Edwin & Francis Trustees	AF	N	Y	N
39	49	1.5	Fronckus	Edwin & Francis Trustees	AF	N	Sawmill River	N
39	52	2.2	Fronckus	Edwin & Francis Trustees	AF	N	Y	N
39	53	17.0	Fronckus	Edwin & Francis Trustees	AF	Y	Y	N
39	5	40.1	Garbiel	Karl	AF	N	Y	N
39	37	36.1	Garbiel	Karl	AF	N	Y	Y (APR Farm)
41	26	0.3	Garbiel	Karl	AF	N	Sawmill River	Y (DFG)
42	6	29.2	Garbiel	Karl	AF	N	Y	N
42	8	5.4	Garbiel	Karl	AF	N	Y	N
42	9	7.6	Garbiel	Karl	AF	Y	Sawmill River	N
42	10	1.5	Garbiel	Karl	AF	N	Sawmill River	N
42	13	10.4	Garbiel	Karl	AF	N	Y	N
42	75	11.3	Garbiel	Karl	AF	N	Sawmill River	N
47	12	8.2	Garbiel	Karl	AF	N	Y	Y (APR Farm)
47	14	2.5	Garbiel	Karl	AF	N	Y	across from APR farm
47	20	23.5	Garbiel	Karl	AF	N	N	N
47	15	32.8	Greene	Marc	AF	Y	Y	across from APR farm
41	2	14.7	Hanold	Pamela	AF	N	Connecticut River	Y (DFG)
32	51	19.1	Hemond	Frances	AF	Y	Hatchery Brook	Y (APR Farm)
32	81	2.5	Hemond	Frances	AF	N	Hatchery Brook	Y (DCR)
44	56	6.4	Jiang	Xin Miao	RB	N	Sawmill River	N
44	61	16.9	Jiang	Xin Miao	RB	Y	Streams, Sawmill	N
51	96	1.0	Komosa	Henry	AF	N	N	
51	97	2.5	Komosa	Henry	AF	N	N	
51	98	2.1	Komosa	Henry	AF	N	N	
25	2	15.3	Kozik	Karla	ID	N	N	N
25	3	18.9	Kozik	Karla	AF-4	N	N	N
25	19	1.4	Kozik	Karla	AF-4	N	N	N
49	1	16.6	Kretzenger	Suzanne, Trustee	RB	N	Y	
49	3	1.8	Kretzenger	Suzanne, Trustee	RB	N	Y	
49	6	9.2	Kretzenger	Suzanne, Trustee	RB	N	Y	
44	32	15.2	Lang	Charles, Jr.	RB	Y	N	

Map	Lot	Acres	Last Name	First Name	Zoning	Resi- dence	Stream	Adj. To Cons. Land?
45	54	70.2	Lang	Charles, Jr.	AF-4	N	N	
38	5	8.2	Mieczkowski	Mieczyslaw & Edward	AF	Y	N	Y (APR Farm)
39	86	5.3	Mieczkowski	Mieczyslaw & Edward	AF	N	N	N
38	1	11.0	Nourse Realty LLC		AF	Y	Connecticut River	Y (APR Farms)
38	4	34.6	Nourse Realty LLC		AF	N	Connecticut River	Y (APR Farm)
38	6	2.3	Nourse Realty LLC		AF	N	Sawmill River	N
39	2	10.0	Nourse Realty LLC		AF	N	N	Y (APR Farm)
39	89	4.4	Nourse Realty LLC		AF	N	N	N
44	36	11.7	Peura	Andrew & Kathleen	RB	Y	N	N
46	14	36.1	Senn	James & Claire	AF-4	N	Y	
46	15	4.9	Senn	James & Claire	AF-4	N	Y	
46	24	9.4	Senn	James & Claire	AF-4	N	N	
46	26	1.6	Senn	James & Claire	AF-4	N	N	
46	30	10.6	Senn	James & Claire	AF-4	N	Y	
46	72	56.2	Senn	James & Claire	AF-4	N	Y	
46	78	6.5	Senn	James & Claire	AF-4	N	N	
40	45	11.3	Sirum	Anthony & Amelia	RB	Y	N	
40	47	8.5	Sirum	Anthony & Amelia	RB	N	N	N
40	57	35.3	Sirum	Anthony & Amelia	RB	N	Goddard Brook	N
45	25	166.9	Sirum	Anthony & Amelia	AF-4	N	Goddard Brook	Y (watershed)
52	80	59.7	Starkweather	Andrew	AF-4	N	N	
52	151	40.0	Starkweather	Andrew	AF-4	N	Y	
52	153	0.05	Starkweather	Andrew	AF-4	N	N	
51	2	4.2	Webber	Suzanne	AF	Y	Cranberry Pond Brook	Y (APR Farm)
50	4	2.5	Whitmore	William	AF	N	Connecticut River	N
50	5	4.4	Whitmore	William	AF	N	Connecticut River	N
Total		1,312						

Source: Montague Assessors' Office.

Table 5-5: Unprotected Agricultural Land

Map	Lot	Acres	Last Name	Zoning	Residence	Stream	Adjacent to Cons. Land?
48	62	26.4	Aitken	AF-2, AF	Y	Y	N
41	6	6.9	Dacyczyn	AF	Y	Sawmill River	Y (APR Farm)
41	20	1.8	Gaier/Reiber	AF	Y	Y	Y (CR, APR, DFG)
18	9	21.4	Gendron	AF-4	Y	N	Y (CR Farm)
49	16	25.5	Jenks	RB	N	Y	N
32	6	14.3	Kline	AF	Y	Y, Pond	N
41	7	4.1	Lapinski	AF	Y	Sawmill River	Y (APR Farm)
52	65	21.5	Montague Retreat	AF-4	Y	Spaulding Brook	Y (DFG)
51	16	39.9	Podlenski	AF	Y	Y	Y (APR)
51	17	0.2	Podlenski	RB	N	N	N
51	93	1.8	Podlenski	AF	N	N	N
42	5	10.4	Rosenau	AF	Y	Y	N
39	56	2.2	Voiland	AF	Y	N	N
48	8	33.3	Watroba	AF-2	N	Y, Pond	N
48	57	5.2	Watroba	AF-2	N	N	N
48	87	17.5	Watroba	AF-2	Y	Y	N
48	88	28.3	Watroba	AF-2	Y	Y	N
48	24	9.4	Watroba	AF-2	N	N	N
Total		270					

Source: Montague Assessors' Office.

Privately-owned Forest

Approximately 3,367 acres, or 17% of the town's area is privately owned forest. This is an underestimate, as it does not include all forested land owned by utility companies or forest residences on lots under twenty acres. In fact, there are many homes on lots ranging between four and twenty acres east of Route 63, and much of this land is forested and contiguous with larger forest parcels.

An estimated 290 acres of privately owned forested land are permanently protected through a Conservation Restriction (Table 5-6). These areas include around Chestnut Hill Loop Road, and near the Wendell border along East Chestnut Hill Road, Dry Hill Cross Road, and Dry Hill Road. These parcels were protected through the Mormon Hollow Landscape Partnership Project in 2017, and account for an increase of permanently protected forest since 2010 of 186 acres. In addition, many of the permanently protected farms shown in Table 5-3 include woodlots.

Table 5-6: Permanently Protected Private Forest in Montague

Map	Lot	Acres Protected	Type of restriction	Landowner	Restriction Holder
46	42	9.4	CR	Damon, Audrey	MGLCT, Town
46	48	24.9	CR	Damon, Audrey c/o William Hunting	MGLCT, Town
46	63	24.8	CR	Damon, Audrey c/o William Hunting	MGLCT, Town
50	27	0.5	CR	Dancs, Anita & William Sweeney	DCR
24	6	5.0	CR	Haas, Richard & Janet	DFG
46	45	28.3	CR	Hunting, William, & Audrey Damon	MGLCT, Town
46	64	10.9	CR	Hunting, William & Audrey Damon	MGLCT, Town
50	3	2.6	CR	Nicholson, Walter Trustee & Nicholson 2012 Family Trust	DCR
50	19	2.6	CR	Nicholson, Walter Trustee & Nicholson 2012 Family Trust	DCR
46	43	3.3	CR	Patnode, Jeannette	MGLCT, Town
46	46	10.2	CR	Perkins, Edward	MGLCT, Town
46	47	11.8	CR	Perkins, Edward	MGLCT, Town
35	45	14.0	CR	Smith, Denton & Marsha	MGLCT, Town
35	46	10.3	CR	Smith, Denton & Marsha & Phillip & Nancy Szenher	MGLCT, Town
35	47	29.1	CR	Smith, Denton & Marsha, & Phillip & Nancy Szenher	MGLCT, Town
51	3	6.2	CR	Stachelek, Patricia	
53	37	17.9	CR	Walker, Robert & Muriel	Franklin Land Trust
53	41	46.1	CR	Walker, Robert & Muriel	Franklin Land Trust
53	42A	3.5	CR	Walker, Robert & Muriel	Franklin Land Trust
53	49	10.0	CR	Walker, Robert & Muriel	Franklin Land Trust
53	57	3.6	CR	Walker, Robert & Muriel	Franklin Land Trust
53	63	5.2	CR	Walker, Robert & Muriel	Franklin Land Trust
53	64	9.6	CR	Walker, Robert & Muriel	Franklin Land Trust
Total		290			

Source: Montague Assessors' Office, Montague Planning Department.

Approximately 8% of land in Montague is enrolled in Chapter 61 (Table 5-7). Average ownership is approximately 30 acres; median ownership is roughly 24 acres. The Chapter 61 program is intended for landowners interested in long-term active forest management. Program requirements include at least 10 contiguous acres and a State-approved forest management plan

developed by a licensed forester or landowner.⁴ The number of acres enrolled in Chapter 61 since 2010 has increased by approximately 291 acres.

Table 5-7: Privately-Owned Forest Land enrolled in Chapter 61 in Montague

Map	Lot	Acres	Last name	First Name	Zoning	Residence	Stream	Adj. to Cons. Land?
53	40	36.1	Abele	Anna	AF-4	Y	N	N
53	53	20.9	Bastl	Christine	AF-4	N	Y	
53	33	9.4	Bauman	Amy, Trustee	AF-4	N	Y	
53	35	19.3	Bauman	Amy, Trustee	AF-4	N	Y	N
53	36	11.1	Bauman	Amy, Trustee	AF-4	N	Y	Y (CR)
53	46	36.5	Bauman	Amy, Trustee	AF-4	Y	Y, pond	N
45	43	163.0	Clapp	James	AF-4	N	N	
50	16	27.7	Craven	Barbara	AF	N	Cranberry Pond Brook	N
50	17	4.9	Craven	Barbara	AF	N	N	N
50	18	45.2	Craven	Barbara	AF	N	Y	N
45	37	37.9	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	N
45	46	39.5	Cutting Estate	c/o Beth Cutting	AF-4	N	N	N
45	47	35.8	Cutting Estate	c/o Beth Cutting	AF-4	N	N	N
46	55	30.9	Cutting	Lucius, c/o Beth Cutting	AF-4	N	N	
46	57	140.3	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	Y (Watershed, DFG)
52	16	10.3	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	DFG
52	17	10.9	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	DFG
52	18	7.3	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	DFG
52	21	37.5	Cutting Estate	c/o Beth Cutting	AF-4	N	Spaulding Brook	DFG
52	22	22.7	Cutting Estate	c/o Beth Cutting	AF-4	N	Y	DFG
45	10	13.1	Davey	John & Brooks	AF-4	N	N	
53	16	24.4	Diemand	Anthony	AF-4	Y	N	
47	19	48.2	Edwards	Charles	AF-2, AF	Y	Y	N
25	1	7.3	Elliott	James & Connie	AF-4	N	N	
25	7	32.4	Elliott	James & Connie	AF-4	N	N	N
25	5	13.8	Elliott	James & Connie	AF-4	N	N	Y (Waidlich Farm)
35	23	48.9	Ellis	Ralph & Joan	AF-4	Y	Y	Y (DCR)
45	61	34.9	Gocłowski	Bernard & Clara	AF-4	Y	Y	
51	5	25.5	Gorfine	Tetty	AF	Y	N	APR Farm
35	1	74.7	Lagoy	Gail & Michael	AF-4	Y	Y	

⁴ UMass Amherst's MassWoods website: <http://masswoods.net/landowner-programs/chapter-61-current-use-tax-programs>. Accessed March 24, 2017.

Map	Lot	Acres	Last name	First Name	Zoning	Residence	Stream	Adj. to Cons. Land?
35	3	8.3	Lagoy	Gail & Michael	AF-4	N	N	
35	41	35.7	Laster	Leon	AF-4	Y	Y	
52	31	10.1	Pinardi	David & Denise	AF-4	Y	Stream	N
52	69	3.5	Pinardi	David & Denis	AF-4	N	N	
52	81	0.5	Pinardi	David	AF-4	N	N	N
52	118	31.5	Pinardi	David & Denise	AF-4	N	N	DFG
52	131	2.4	Pinardi	David & Denise	AF-4	N	N	N
53	42	5.0	Redbrook Farm LLC		AF-4	N	Y	Y (CR)
53	43	62.7	Redbrook Farm LLC		AF-4	Y	Y	N
26	2	69.4	Rewa, Andrew	Sandra Dowd	AF	N	N	Y (APR)
48	68	15.4	Simons	Thomas	AF	N	N	N
50	13	8.3	Simons	Thomas	AF	Y	N	Y (APR Farm)
52	8	4.9	W D Cows Inc.		AF-4	N	N	N
52	9	4.5	W D Cows Inc.		AF-4	N	Y	
52	11	17.3	W D Cows Inc.		AF-4	N	N	
52	12	4.9	W D Cows Inc.		AF-4	N	N	
53	15	47.1	W D Cows Inc.		AF-4	N	N	DCR
53	17	25.2	W D Cows Inc.		AF-4	N	N	DCR
53	18	25.5	W D Cows Inc.		AF-4	N	Chestnut Hill Brook	DCR
52	7	19.9	WD Cows, Inc.		AF-4	N	Y	DFG
51	6	26.2	Weaver	Robert	AF	Y	N	APR Farm
53	58	7.9	Williamson	Patrick & Anne	AF-4	N	Chestnut Hill Brook	N
53	79	11.0	Williamson	Patrick & Anne	AF-4	N	Y	
35	4	90.6	Zschau	Peter & Melanie	AF-4	Y	Stream	Y (DCR)
Total		1,608						

Source: Montague Assessors' Office.

Tables 5-8 includes information on unprotected private forest land not enrolled in Chapter 61 in Montague. This category includes:

- All forested parcels larger than 20 acres
- Forested parcels in common ownership totaling at least 20 acres
- Several small parcels encompassing critical resources, such as floodplain forest

It does not include large-lot forest residences or isolated small forest parcels. Utility company land on the Montague Plains and along the Connecticut River is discussed separately.

Table 5-8: Unprotected Privately-Owned Forest Land in Montague

Map	Lot	Acres	Last Name	Zoning	Residence	Stream	Adj. to Cons. Land
53	45	31.7	Bauman	AF-4	N	Williams Brook	N
47	25	35.1	Belunas	AF-2, AF	N	N	Y (APR Farm)
41	16	29.2	Burek	AF	N	N	Y (APR Farm)
34	39	50.2	Denkiewicz	AF-4	N	N	Y (Watershed)
42	92	23.7	Donovan	RS	N	Y	Y (DFG)
41	9	8.9	Fairbrother	AF	Y	Sawmill River	Y (APR Farm, DFG)
41	10	12.1	Fairbrother	AF	N	Sawmill River	Y (DFG)
52	4	18.3	Gezork	AF-4	N	Pond	Y (DFG)
52	5	20.4	Gezork	AF-4	N	Y	Y (DFG)
35	11	37.5	Guilford	AF-4	N	Millers River	N
35	42	8.3	Hubert	AF-4	N	Y	N
52	58	27.3	Lovejoy, S.	AF-4	N	N	(across from DFG)
52	145	17.3	Lovejoy, S.	AF-4	N	N	Y (DFG)
45	21	25.0	Lyon, James	AF-4	Y	Y	N
26	15	9.2	Mann	ID	N	N	Y (DFG Plains)
53	22	51.4	McMahon	AF-4	Y	Chestnut Hill Brook	Y (DFG)
50	14	37.6	Miller	AF	Y	Cranberry Pond Brook	N
52	32	20.1	Nazar	AF-4	Y	Y	Y (DFG)
44	17	15.9	Perkins	RB	N	N	Y (Watershed)
44	18	11.8	Perkins	AF	N	Goddard Brook	Y (Watershed)
46	46	10.2	Perkins	AF-4	N	N	N
46	47	11.8	Perkins	AF-4	N	N	Y (DCR)
45	42	30.9	Peura	AF-4	N	N	N
52	1	26.2	Peura	AF-4	N	N	Y (DFG)
52	2	16.6	Peura	AF-4	N	Y	Y (DFG)
40	17	9.4	Reil	ID	N	Y	Y (DFG Plains)
52	51	32.0	Rogalski	AF-4	N	Sawmill River	N
48	67	8.0	Ross	AF	N	N	N
48	90	16.2	Ross	AF	Y	N	N
45	11	30.5	Sawin	AF-4	N	Y	Y (Watershed)
52	146	20.9	Singleton	AF-4	N	N	Y (DFG)
45	41	35.4	Sirum	AF-4	N	N	N
53	21	50.2	Stafford	AF-4	Y	N	N
45	5	27.4	Thomas	AF-4	N	N	Y (Watershed)
Total		817					

Source: Montague Assessors' Office.

As noted in Section 3, utility companies are major owners of undeveloped land in Montague.

Table 5-9 includes information on forested land owned by Rocky River Realty Co., the

landholding company for Eversource, on the Montague Plains. This land is planned for eventual industrial development. Because this area is designated as priority habitat for rare and endangered species, state regulations may result in some limits on where new development can occur, but it is unlikely that the entire area will remain undeveloped in the long term.

Table 5-9: Unprotected Utility Company Land on the Montague Plains

Map	Lot	Acres	Owner	Zoning	Home?	River?	Adj. to Cons. Land?
24	10	8.8	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
24	21	2.8	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
24	22	16.5	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
24	23	8.0	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
24	24	5.0	Rocky River Realty Co.	ID	N	N	N
24	25	23.2	Rocky River Realty Co.	ID	N	N	N
27	7	3.6	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	8	7.0	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	9	39.4	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	10	22.0	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	11	2.8	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	12	20.8	Rocky River Realty Co.	ID	N	N	N
27	13	35.8	Rocky River Realty Co.	ID	N	N	N
27	14	32.7	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	15	8.5	Rocky River Realty Co.	ID	N	N	N
27	16	8.2	Rocky River Realty Co.	ID	N	N	N
27	17	3.9	Rocky River Realty Co.	ID	N	N	N
27	18	9.3	Rocky River Realty Co.	ID	N	N	N
27	19	11.0	Rocky River Realty Co.	ID	N	N	N
27	20	5.7	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	30	4.1	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
27	14A	0.9	Rocky River Realty Co.	ID	N	N	N
27	8A	0.3	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
28	1	15.3	Rocky River Realty Co.	ID	N	N	N
28	2	18.9	Rocky River Realty Co.	ID	N	N	N
28	3	9.5	Rocky River Realty Co.	ID	Y	N	N
28	4	0.4	Rocky River Realty Co.	AF-4	N	N	N
28	5	2.2	Rocky River Realty Co.	AF-4	N	N	N
28	6	3.2	Rocky River Realty Co.	AF-4	N	N	N
28	7	0.8	Rocky River Realty Co.	AF-4	N	N	N
28	14	3.2	Rocky River Realty Co.	AF-4	N	N	Y (Cemetery)
28	15	20.9	Rocky River Realty Co.	AF-4	N	N	Y (Cemetery)
28	16	3.5	Rocky River Realty Co.	AF-4	N	N	N
28	17	4.6	Rocky River Realty Co.	AF-4	N	N	N
28	21	40.9	Rocky River Realty Co.	AF-4	N	N	N
28	22	13.6	Rocky River Realty Co.	AF-4	N	N	N
28	23	13.5	Rocky River Realty Co.	AF-4	N	N	N
28	24	0.5	Rocky River Realty Co.	AF-4	N	N	N
28	25	34.8	Rocky River Realty Co.	AF-4	N	N	Y (Watershed)
28	26	4.4	Rocky River Realty Co.	AF-4	N	N	N

Map	Lot	Acres	Owner	Zoning	Home?	River?	Adj. to Cons. Land?
28	27	28.7	Rocky River Realty Co.	AF-4	N	N	N
28	31	2.5	Rocky River Realty Co.	AF-4	N	N	N
28	36	6.1	Rocky River Realty Co.	AF-4	N	N	N
39	58	1.2	Rocky River Realty Co.	AF	N	N	Y (APR)
40	14	1.5	Rocky River Realty Co.	ID	N	N	Y (DFG Plains)
Total		511					

Source: Montague Assessors' Office.

Additional unprotected land owned by utility companies in Montague is identified in Table 5-10 below.

Table 5-10: Additional Unprotected Utility Company Land in Montague

Map	Lot	Acres	Location	Owner	Zoning
3	82	1.83	Rear Canal St	Montague Energy Group Llc	HI
3	83	0.00	Rear Canal St	Montague Energy Group Llc	HI
5	153	2.13	Rear Avenue A	Montague Energy Group Llc	ID/AF
6	358	0.97	Rear Avenue A	Montague Energy Group Llc	GB
4	175	0.15	Third St	Rocky River Realty Company	CB
4	279	0.68	Prospect St	Rocky River Realty Company	NB
5	90	0.23	Twelfth St	Rocky River Realty Company	RS
5	93	0.24	Thirteenth St	Rocky River Realty Company	RS
5	94	0.33	Thirteenth St	Rocky River Realty Company	RS
5	95	0.23	Fourteenth St	Rocky River Realty Company	RS
5	123	0.17	N St	Rocky River Realty Company	RS
5	136	0.78	Fifteenth St	Rocky River Realty Company	RS
5	144	0.17	Fifteenth St	Rocky River Realty Company	RS
5	145	1.10	Sixteenth St	Rocky River Realty Company	RS
5	150	0.64	Sixteenth St	Rocky River Realty Company	RS
7	23	0.07	First St	Rocky River Realty Company	RE
9	4	3.67	Paradise Parkway	Rocky River Realty Company	ID
9	69	30.27	Montague City Rd	Rocky River Realty Company	RE
14	163	0.78	Oak St	Rocky River Realty Company	RS
16	1	11.17	Millers Falls Rd	Rocky River Realty Company	RS
25	10	113.51	East Mineral Rd	Rocky River Realty Company	4A
25	11	47.19	East Mineral Rd	Rocky River Realty Company	4A
25	21	0.16	East Mineral Rd	Rocky River Realty Company	4A
26	6	2.29	Greenfield Rd	Rocky River Realty Company	AF
26	27	23.49	Greenfield Rd	Rocky River Realty Company	AF
26	29	1.47	Greenfield Rd	Rocky River Realty Company	AF
26	40	30.00	Turners Falls Rd	Rocky River Realty Company	AF
32	3	7.59	230 Greenfield Rd	Rocky River Realty Company	AF
32	60	4.10	Rear Greenfield Rd	Rocky River Realty Company	AF
32	61	2.30	Rear Greenfield Rd	Rocky River Realty Company	AF
32	62	1.40	Rear Greenfield Rd	Rocky River Realty Company	AF
33	71	3.74	Lake Pleasant Rd	Rocky River Realty Company	ID
2	1C	0.09	16 Canal Rd	Turners Falls Hydro Llc	ID

Map	Lot	Acres	Location	Owner	Zoning
6	103	0.10	Spring St	Eversource	RS
7	102	0.36	Riverside Dr	Eversource	RS
9	75	1.20	Walnut St	Eversource	RS
9	84	6.09	Walnut St	Eversource	RS
9	86	0.01	Montague City Rd	Eversource	RS
12	27	0.36	Depot St	Eversource	NB
12	28	0.52	Depot St	Eversource	NB
12	29	0.52	Depot St	Eversource	NB
12	31	1.53	Rear Depot St	Eversource	NB
12	32	0.21	Depot St	Eversource	NB
12	33	0.46	Depot St	Eversource	NB
12	34	0.11	Depot St	Eversource	NB
12	43	2.11	20 Farren Av	Eversource	NB
12	67	2.58	Rear Cabot St	Eversource	UN
14	3	0.63	Dell St	Eversource	RS
14	38	0.37	Dell St	Eversource	RS
14	90	0.92	9 Oak St	Eversource	RS
21	40	2.40	Rear Turners Falls Rd	Eversource	PS
29	106	0.22	West Main St	Eversource	CB
31	47	1.06	South Prospect St	Eversource	RS
32	5	3.30	Rear Old Greenfield Rd	Eversource	ID
32	50	1.30	Rear Old Greenfield Rd	Eversource	ID
34	23	1.93	Federal St	Eversource	RS
34	24	5.20	Federal St	Eversource	4A
34	45	14.70	Federal St	Eversource	4A
34	60	0.01	Green Pond Rd	Eversource	4A
35	6	18.11	South Prospect St	Eversource	4A
35	40	2.44	South Prospect St	Eversource	4A
35	6A	2.10	South Prospect St	Eversource	4A
40	41	4.90	Rear Lake Pleasant Rd	Eversource	RB
40	62	1.01	Lake Pleasant Rd	Eversource	RB
45	40	0.72	Dry Hill Rd	Eversource	4A
45	56	17.50	Dry Hill Rd	Eversource	4A
46	34	67.60	Wendell Rd	Eversource	4A
46	68	4.08	Wendell Rd	Eversource	4A
46	71	0.78	Rear Wendell Rd	Eversource	4A
46	75	0.57	Dry Hill Cross Rd	Eversource	4A
53	9	22.50	Rear E Chestnut Hill Rd	Eversource	4A
53	20	3.40	E Chestnut Hill Rd	Eversource	4A
53	23	7.30	Chestnut Hill Lp	Eversource	4A
53	26	0.42	Chestnut Hill Lp	Eversource	4A
53	50	1.15	E Chestnut Hill Rd	Eversource	4A
53	51	3.43	Chestnut Hill Lp	Eversource	4A
53	52	1.40	E Chestnut Hill Rd	Eversource	4A
Total		501			

Source: Montague Assessors' Office.

Privately-Owned Recreational Land

FirstLight Power owns most of the land in Montague along the Connecticut River north and east of its confluence with the Deerfield River. It also owns 79 acres of land on islands or under water in the Connecticut River. Land along the Connecticut River has many values for open space: it provides flood control, wildlife habitat, beautiful scenery and recreational opportunities. Most of the utility-owned land along the river is forested. FirstLight Power's ownership and management of this land is a condition of its Federal Energy Regulatory Commission (FERC) license for its hydroelectric facilities in Montague and Erving. Therefore, all land subject to the FERC license is considered to have limited protection from development. Land owned by other utility companies, such as Eversource, that is not subject to a FERC license is not considered to have any protection from development.

Under its FERC license, FirstLight is required to provide recreational benefits to the communities bordering the river. In Montague, the company currently maintains a canoe launch at the end of Poplar Street in Montague City, a park and picnic area along the river in Turners Falls, and fishing access at Cabot Woods and Cabot Camp. FirstLight also leases land to the Department of Conservation and Recreation for the Canalside Trail Bike Path.

The hydroelectric power facilities on the Connecticut River owned by FirstLight Power are currently undergoing FERC relicensing, as the current license will expire in April 2018. As discussed in Section 3: Community Setting, the process includes a review of how the hydroelectric facilities impact the river and communities through a number of required studies and public meetings. The Town of Montague, along with other local and regional stakeholder organizations, has been an active participant in the process. Through the process the Town has requested that under the new license, recreational access to the Connecticut River will be improved for residents. Specific improvements include: maintaining an acceptable minimum flow in the bypass reach of the Connecticut River for recreation, such as white water rafting, and to support fish habitat; and providing Montague residents with adequate, user friendly public access points to the Connecticut River for recreation, especially adding a put-in below the Turners Falls Dam, adding cartop boat access at Unity Park, providing foot access to the Rock Dam, implementing accessibility improvements to the Poplar Street boat launch, and adding cartop boat access at Cabot Camp.

Table 5-11: Utility Company Land with Limited Protection in Montague

Map	Lot	Acres	Use	Protection	Owner
2	2	18.9	Power Canal	FERC	FirstLight Power
2	3	1.1	Riverfront	FERC	FirstLight Power
2	4	3	Riverfront	FERC	FirstLight Power
3	28	3.6	Riverfront	FERC	FirstLight Power
3	29	0.02	Riverfront	FERC	FirstLight Power
3	46	3.1	Power Canal	FERC	FirstLight Power
3	47	2.8	Power Canal	FERC	FirstLight Power
4	3	0.1	Gatehouse / bike path	FERC	FirstLight Power
4	5	0.3	Gatehouse / bike path	FERC	FirstLight Power
4	6	0.8	Recreational	FERC	FirstLight Power
4	7	4.7	Recreational	FERC	FirstLight Power
4	8	1.9	Riverfront	FERC	FirstLight Power
4	9	0.6	Recreational	FERC	FirstLight Power
4	15	0.3	Recreational	FERC	FirstLight Power
5	40	0.1	Power Canal / path	FERC	FirstLight Power
5	128	8.1	Power Canal	FERC	FirstLight Power
5	149	1.3	Power Canal	FERC	FirstLight Power
5	151	40.5	Right of Way	FERC	FirstLight Power
7	27	3.1	Riverfront	FERC	FirstLight Power
7	37	1.2	Riverfront	FERC	FirstLight Power
7	93	0.3	Riverfront	FERC	FirstLight Power
7	103	0.1	Riverfront	FERC	FirstLight Power
7	144	0.2	Riverfront	FERC	FirstLight Power
8	1	61.1	Riverfront/Power Canal	FERC	FirstLight Power
8	2	3.5	Power Canal	FERC	FirstLight Power
9	1	15.8	Power Canal	FERC	FirstLight Power
9	2	23.4	Power Canal	FERC	FirstLight Power
9	3	3.9	Right of Way	FERC	FirstLight Power
11	48	27	Riverfront	FERC	FirstLight Power
11	116	4.7	Land Under Water	FERC	FirstLight Power
11	117	4.6	Land Under Water	FERC	FirstLight Power
11	118	3.9	Land Under Water	FERC	FirstLight Power
12	1	25.8	Power Canal	FERC	FirstLight Power
12	2	4.9	Right of Way	FERC	FirstLight Power
12	3	13.2	Right of way, Wetlands	FERC	FirstLight Power
12	25	0.4	Transmission lines	FERC	FirstLight Power
12	26	0.7	Right of way, Wetlands	FERC	FirstLight Power
12	30	4.4	Canal access, bike path	FERC	FirstLight Power
12	56	2.6	Open/Wetlands	FERC	FirstLight Power

Map	Lot	Acres	Use	Protection	Owner
12	58	0.9	Open/Wetlands	FERC	FirstLight Power
13	8	0.7	Right of way	FERC	FirstLight Power
13	16	15.3	Open/Wetlands	FERC	FirstLight Power
15	20	0.5	Open	FERC	FirstLight Power
15	21	9.9	Riverfront	FERC	FirstLight Power
15	213	11	Riverfront	FERC	FirstLight Power
17	1	3.8	Land Under Water	FERC	FirstLight Power
17	2	2.5	Land Under Water	FERC	FirstLight Power
17	3	21.8	Land Under Water	FERC	FirstLight Power
17	4	10.3	Land Under Water	FERC	FirstLight Power
17	5	4.8	Land Under Water	FERC	FirstLight Power
17	6	8.5	Land Under Water	FERC	FirstLight Power
17	7	10.5	Land Under Water	FERC	FirstLight Power
17	8	3.7	Land Under Water	FERC	FirstLight Power
17	9	4.9	Riverfront	FERC	FirstLight Power
17	10	3.7	Riverfront	FERC	FirstLight Power
17	12	13	Riverfront	FERC	FirstLight Power
17	17	8.4	Recreational	FERC	FirstLight Power
17	18	27	Recreational	FERC	FirstLight Power
17	34	72	Recreational	FERC	FirstLight Power
18	1	3.5	Riverfront	FERC	FirstLight Power
18	3	5	Riverfront	FERC	FirstLight Power
18	12	4	Riverfront	FERC	FirstLight Power
18	13	1.8	Riverfront	FERC	FirstLight Power
18	15	2.3	Recreational	FERC	FirstLight Power
18	16	1.1	Parking lot	FERC	FirstLight Power
19	1	1.2	Driveway	FERC	FirstLight Power
19	74	0.7	Recreational	FERC	FirstLight Power
25	17	3.5	Riverfront	FERC	FirstLight Power
Total Acres		552			

Source: Montague Assessors' Office.

Other than lands owned by FirstLight Power, there is relatively little privately-owned recreational land in the Town of Montague. Thomas Memorial Golf Course on Montague City Road is privately-owned and enrolled in Chapter 61B, which is similar to Chapter 61 and 61A but is designed specifically for land in recreational use. The Millers Falls Rod & Gun Club, located off Turners Falls Road, is not enrolled in any land protection program. A project to create a small recreational area on property owned by the Freemasons in Montague City was completed in 2010. The Harmony Lodge Wildlife viewing area includes a bench and informational signage to provide visitors an understanding of the wetland habitat around them

and the historical significance of the site, which was once part of the canal system. The facility is located along the Canalside Trail Bike Path on property behind the lodge on Masonic Street. The bench placed at the site is in honor of Charles W. Hazelton, a historical figure of Montague.

Table 5-12: Other Privately-Owned Recreational Land in Montague

Map	Lot	Acres	Owner	Zoning	Use	Level of Protection
51	52	16.5	Kachavos, Elaine & Janice	AF	Horse riding/boarding	61B
51	53	1.0	Kachavos, Elaine J.	AF	Horse riding/boarding	61B
20	6	44.4	Mckay, Mary	AF	Residence, Forest	61B
19	12	5.0	Mechanics Lodge Building Association Inc.	ID	Harmony Lodge Wildlife Viewing Area	None
26	4	1.5	Millers Falls Rod & Gun Club	AF	Fish and Game Club	None
26	3	9.8	Millers Falls Rod & Gun Club	AF	Fish and Game Club	None
35	36	14.6	Rugg, Richard, Trustee	AF-4	Hunting	61B
9	78	0.7	Thomas, Warren	RS	Adjacent to Golf Course	61B
9	80	4.7	Thomas, Warren	RE	Golf Course	61B
9	87	32.6	Thomas, Warren	RE	Golf Course	61B
10	141	0.6	Thomas, Warren	RS	Golf Course	61B
10	148	0.2	Thomas, Warren	RS	Golf Course	61B
14	4	0.1	Thomas, Warren	RE	Golf Course	61B
Total		132				

Source: Montague Assessors' Office.

B. PUBLICLY OWNED OPEN SPACE

There are approximately 6,770 acres of publicly-owned open space in Montague, accounting for about 34% 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 Montague. For the purposes of this section, both public and privately-owned cemeteries are included in this category. There is no known publicly-owned farmland in Montague. Most of the publicly-owned open space in Montague is forested, parks and ballfields, or occupied by cemeteries.

State and Federally-owned land in Montague is shown in Table 5-13. The Massachusetts Department of Fish and Game (DFG) is the largest single property owner in the Town of Montague. The agency owns approximately 3,785 acres in two large blocks on the Montague Plains and east of Route 63, and three smaller ones. The Montague Plains Wildlife Management Area includes over 10 miles of unmarked trails in the center of town, access via trailheads at Plains Road, Lake Pleasant Road, and Millers Falls Road. Between 2006 and 2008, DFG purchased three parcels along Federal Street, Dry Hill Road, and North Leverett Road totaling

roughly 236 acres. In 2014, DFG purchased parcels between Greenfield Road and Turners Falls Road, behind Hillside Road, and on South Street, totaling approximately 167 acres. The Bitzer State Fish Hatchery raises trout for stocking around the state and is open to visitors daily. In the fall it is used as a checking station for hunters.

The Sawmill River Access Area also known as the North Street Wildlife Management Area in Montague Center is much loved and very heavily used by area residents for walking, cross-country skiing, sledding and hunting. A bridge over the Sawmill River providing access from Montague Center to the majority of the conservation area washed out in a flood in the spring of 2005, and was replaced by the town in 2012. Lack of adequate parking and riverbank erosion are problems in this area.

The state Department of Conservation and Recreation (DCR) owns approximately 685 acres in Montague. Most of this land is located in the Montague State Forest east of Route 63. DCR also owns small parcels of land on the Montague Plains, along the Connecticut River and on the east side of Route 63 along Cranberry Pond Brook. As discussed in Sections 3 and 4, these state-owned lands offer excellent habitat for wildlife and exceptional opportunities for recreational activities. FirstLight Power leases land to DCR for the Canalside Rail Trail, which is the most used recreational facility in Montague according to respondents of the 2016 Open Space and Recreation Survey. In 2016, the Appalachian Mountain Club built the Hatchery Brook Primitive Campsite on a portion of land owned by DCR along the Connecticut River. The site, part of the Connecticut River Greenway State Park, includes two tent platforms and a picnic table, and is accessible by water only.

Marked trailheads and parking is needed for the State-owned lands in the southeastern corner of town, which encompass a combination of the Montague State Forest and the Montague Wildlife Management Area. Currently the trailheads in these areas lack signage and formal parking. Formalizing and connecting the trails in the Montague Plains to the Dry Hill and Chestnut Hill Trail Systems would create a more connected trail system in town.

Table 5-13: State and Federally Owned Land in Montague

Map	Lot	Acres	Site Name	Owner*	Manager*	Location	Condition	Potential for Recreation	Recreational Activities	Public Access	Zoning	Source of Funds	Level of Protection
192	113.4	10.1	Connecticut River Greenway State Park	DCR	DCR	Greenfield Road	Good	Medium	W, BT, C	Paddle access only	AF	DCR	Permanent
4	1	0.7	Great Falls Discovery Center	DCR	DCR	Avenue A	Good	High	W, B	Free	CB	DCR, Town	Limited
4	2	0.6	Great Falls Discovery Center	DCR	DCR	Avenue A	Good	High	W, B	Free	CB	DCR, Town	Limited
4	40	0.3	Great Falls Discovery Center	MEDIC	DCR	Avenue A	Good	High	W, B	Free	CB	DCR, Town	Limited
4	44	0.7	Great Falls Discovery Center	MEDIC	DCR	Avenue A	Good	High	W, B	Free	CB	DCR, Town	Limited
21	39	18.5	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
21	62	22.6	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
23	44	1.7	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
23	47	25.7	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
23	52	0.6	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
23	56	0.4	Montague Plains Wildlife Management Area	DFG	DFW	Hillside Road	Fair	High	W, XC, B, H, BW	Free	RS	DFW	Permanent
24	38	11.8	Montague Plains Wildlife Management Area	DFG	DFW	Rear Millers Falls Road	Fair	High	W, XC, B, H, BW	Free	ID	DFW	Permanent
32	26	17.1	Montague Plains Wildlife Management Area	DFG	DFW	Turners Falls Road	Fair	High	W, XC, B, H, BW	Free	ID	DFW	Permanent
192	115	1486.3	Montague Plains Wildlife Management Area	DFG	DFW	Center of Town	Fair	High	W, XC, B, H, BW	Free	RS, ID, AF	DFG	Permanent
192	115.1	25.7	Montague Plains Wildlife Management Area	DCR	DFW	Center of Town	Fair	High	W, XC, B, H, BW	Free	ID, AF	DFG	Permanent
26	20	38.5	Montague Plains Wildlife Management Area	DFG	DFW	Turners Falls Road	Fair	High	W, XC, B, H, BW	Free	AF	DFW	Permanent
26	23	54.8	Montague Plains Wildlife Management Area	DFG	DFW	Greenfield Road	Fair	High	W, XC, B, H, BW	Free	AF	DFW	Permanent
192	114.1	7.4	Montague State Forest	DCR	DCR	Route 63	Excellent	High	W, XC, B, H, F, BW	Free	AF	DCR	Permanent
192	114.2	640	Montague State Forest	DCR	DCR	Wendell Road	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DCR	Permanent
45	38	174.1	Montague Wildlife Management Area	DFG	DFG	Dry Hill Road	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DFG	Permanent
51	29	17.8	Montague Wildlife Management Area	DFG	DFG	East of Route 63	Excellent	High	W, XC, B, H, F, BW	Free	RB	DFG	Permanent
52	55	9.4	Montague Wildlife Management Area	DFG	DFG	Ripley Road	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DFG	Permanent
52	57	11.8	Montague Wildlife Management Area	DFG	DFG	Rear Ripley Road	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DFG	Permanent
53	10	20.4	Montague Wildlife Management Area	DFG	DFG	Rear E. Chestnut Hill Road	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DFG	Permanent
192	103	1527.4	Montague Wildlife Management Area	DFG	DFW	East of Route 63	Excellent	High	W, XC, B, H, F, BW	Free	AF-4	DFW	Permanent
192	117.1	180.2	Montague Wildlife Management Area	DFG	DFG	Meadow Road, W. Chestnut Hill Road	Good	Medium	W, XC, B, H, F, BW, SL	Free	AF-4	DFG	Permanent
48	38	7.8	Montague Wildlife Management Area	DFG	DFG	South Street	Good	Medium	W, XC, B, H, F, BW, SL	Free	RS	DFG	Permanent
48	50	1	Montague Wildlife Management Area	DFG	DFG	Main Street	Good	Medium	W, XC, B, H, F, BW, SL	Free	RB	DFG	Permanent
49	39	6.4	Montague Wildlife Management Area	DFG	DFG	South Street	Good	Medium	W, XC, B, H, F, BW, SL	Free	RB	DFG	Permanent
192	102	150.4	Bitzer State Fish Hatchery	DFG	DFG	Turners Falls Road	Good	Low	H	Limited	AF	DFG	Permanent
8	3	20.0	Silvio Conte Anadramous Fish Research Center	USGS	USGS	Migratory Way	Good	High	W, B	Free (grounds only)	UN	USGS	Limited

* DCR = Massachusetts Department of Conservation and Recreation; MEDIC = Montague Economic Development Industrial Corporation; DFG = Massachusetts Department of Fish and Game; DFW = Massachusetts Division of Fisheries and Wildlife (MassWildlife); USGS = United States Geological Survey.

Source: Montague Assessors’ Office.

Recreation Activities	B - Biking	BF – Ball Field	BW – Bird watching	F - Fishing	G – Garden (Community)	H - Hunting	PI – Picnic Area	PL - Playground	SK – Skating
Legend	SL - Sledding	SW - Swimming	T – Tennis Courts	W – Walking/Hiking	XC – Cross-country Skiing	BT – Boating	C - Camping		

The Town of Montague owns public parks in Turners Falls, Millers Falls, Montague Center, and Lake Pleasant. Unity Park, Highland Park, Montague Center Park, and Rutter's Park are maintained by the Town and managed by the Town Parks & Recreation Department. Norma's Park in Lake Pleasant is owned by the Rocky River Realty Company but maintained and managed by the Town. These parks include play equipment for small children and playing fields. Montague City is the only village in Town that does not currently have a park. The Town is exploring the creation of a new small park on Town-owned land in Montague City, adjacent to the bike path, as a long term project.

Unity Park in Turners Falls is the flagship facility for the Montague Parks and Recreation Department (MPRD). The 8.25 acre park is the second most highly utilized recreation facility in Montague (after the Canalside Rail Trail, located across the street from the park) according to the 2016 Open Space and Recreation Survey. Upgrades to the park were identified as a high priority in the 2010 Open Space and Recreation Plan. Prior to improvements, the park included a playground with equipment dating to the 1960s, two ball fields, a basketball court, and a picnic area. The park presented substantial safety and accessibility issues that needed to be addressed. Community Development Block Grant (CDBG) funds were awarded to the town in 2009 to create a master plan for the park. A committee was formed and numerous public meetings were held to develop a plan for the new park design. In 2011, phase I of the project was funded through CDBG, with phase II receiving funding the following year, for a total cost of \$1,060,000. The Franklin County Regional Housing and Redevelopment Authority (HRA) provided project management.

Phase I was completed in August 2012, and included a newly designed playground including a water feature, a paved parking lot, installation of a rain garden, and landscaping. Phase II was



Children enjoy the new water feature at Unity Park.



Unity Skate Park grand opening.

completed in 2013 and included a refurbished basketball court and ball fields, a paved walking path with outdoor fitness stations, a butterfly garden, a community garden, and a second rain garden and paved parking lot. MPRD also worked with a local non-profit group to raise funding to install a fully accessible wheelchair swing adjacent to the playground. Since completion of

improvements, the MPRD has seen a considerable increase in use of the park, which is now a destination for residents of Montague and surrounding communities.

One element of the Unity Park project that had to be eliminated due to cost was the construction of a new skate park. A skateboard park was built at the request of young residents in the late 1990s on land leased by the Town from a private landowner, located adjacent to Unity Park. Many of the users participated in construction of the park, and it was maintained by donations and volunteer labor. In 2009 the skate park was moved to another vacant privately owned lot leased by the Town off of Avenue A. The need for a more permanent skate park continued to be identified by residents. After it was determined that the Unity Park project could not include a skate park, the MRPD began working with the local Skate Park Committee to find funding to complete the project. The Town applied for and received a \$272,000 PARC grant to complete the skate park in 2016, which is located on Town-owned land adjacent to Unity Park.

Peskeomskut Park was built by volunteers organized by the Young Women's Club in 1967 on a vacant lot in Turners Falls. Peskeomskut is the name that the Pocumtuck Indians gave to the site of the falls on the Connecticut River. The Park is owned by the Town, which does basic maintenance, such as tree pruning and lawn mowing. The Women's Club still participates in maintenance and management of the park. There are more than a dozen memorials to residents of the Town in the Park.

During the late 1990s, a committee was formed to develop a master plan for the Peskeomskut Park. A group of residents, including members of the Montague Community Band, were

interested in the possibility of building an outdoor performance space in town, and Peskeomskut Park was considered to be a desirable site. Parents of young children asked the Town if it would be possible to install play equipment in the park as well.

A committee appointed by the Selectmen in 1999 came to consensus on siting a performance structure and a few pieces of play equipment for small children in Peskeomskut Park. A master plan was developed for the park, including a site for the performance structure, in 2001. Construction of a new bandstand and addition of a picnic area, playground equipment, new landscaping and walkways was completed in 2006 using CDBG funds and following a public process. The Town has been promoting community events at the bandstand in the summer months. In 2017, the Town installed additional pedestrian-scale lighting in the park.

The Town plans to redevelop a portion of Town-owned land off of Turnpike Road that currently includes the Town's recycling center and capped landfill. Plans include a new industrial park and a large-scale ground-mounted solar array. Walking trails could be incorporated into wooded areas on the site that will be preserved, providing a passive recreation resource in close proximity to dense residential neighborhoods. In addition, improving the hillside pathways in Turners Falls was identified as a need in the Turners Falls Livability Plan. The Town is also interested in assessing vegetation management on these hillside areas for potential opportunities to open up scenic views from the top of the hill. Town-owned open space and recreation areas are identified in Table 5-14. Land owned by the regional school districts is also included in the table as important recreational resources in town.

In addition to the resources identified in the table, the Turners Falls Fire District and the Montague Center Water District own approximately 1,536 acres of mostly forested land in town (a table identifying these parcels is located in the appendix). The Turners Falls Fire District owns most of this land, including over 1,000 acres in the Hannegan Brook Watershed. In 2016, the Fire District in cooperation with the Town completed a trail system in the watershed area with seven miles of marked hiking trails. The Dry Hill Trail System includes two trails, the Hannegan Brook Loop, and the Dry Hill Cemetery trail. Trailheads with kiosks are located at the end of Dry Hill Road, and on East Chestnut Hill Road. The Dry Hill Trail system intersects with the Robert Frost Trail, a regional hiking trail that begins in the Holyoke Range State Park and travels north through private and public lands to Wendell.

Table 5-14: Town and Regional School District Open Space and Recreation Areas in Montague

Map	Lot	Acres	Site Name	Owner	Manager	Location	Condition	Current Use	Potential for recreation	Public Access	Zoning	Type of Grant Received	Level of Protection
2	6	3.2	Coal Silo/Power Island	Town of Montague	Selectboard	Canal Rd.	Poor	Vacant land/structures	Park, outdoor performance space	Pedestrian bridge from bike path	HI		Limited
17	36	48.0	Franklin County Technical School	Franklin County Technical School District	FCTSD	Industrial Blvd.	Good	Athletic track, ballfields, tennis courts	High–maintain current condition	Industrial Blvd.	ID		Limited
17	11	10.7	Franklin County Technical School	Franklin County Technical School District	FCTSD	Industrial Blvd.	Good	Wooded	Low	Industrial Blvd.	ID		Limited
21	11	20.0	Great Falls Middle School / Turners Falls High School	Gill Montague Regional School District	GMRSD	Turners Falls Rd.	Good	Ballfields, wooded, trails	High–maintain current condition	Turners Falls Rd.	RE		Limited
22	15	6.1	Great Falls Middle School / Turners Falls High School	Gill Montague Regional School District	GMRSD	Turnpike Rd.	Good	Tennis courts, ballfields	High–maintain current condition	Turnpike Rd.	RE		Limited
22	16	20.7	Great Falls Middle School / Turners Falls High School	Gill Montague Regional School District	GMRSD	Turnpike Rd.	Good	Athletic track, ballfields, indoor pool	High–maintain current condition	Turnpike Rd.	RE		Limited
22	43	20.2	Great Falls Middle School / Turners Falls High School	Gill Montague Regional School District	GMRSD	Hillside Rd.	Good	Ballfields, trails	High–maintain current condition	Turnpike Rd., Hillside Rd.	RE		Limited
22	44	3.7	Great Falls Middle School / Turners Falls High School	Gill Montague Regional School District	GMRSD	Turnpike Rd.	Good	Ballfields, wooded	High–maintain current condition	Turnpike Rd.	RE		Limited
29	79	0.7	Highland Park	Town of Montague	Parks and Recreation	Grand Ave.	Good	Wooded; adjacent to park	High–upgrade park	Grand Ave., Lyman St.	RS		Limited
29	82	5.5	Highland Park	Town of Montague	Parks and Recreation	Lyman St.	Good	Park, ballfields	High–upgrade park	Grand Ave., Lyman St.	RS		Limited
43	118	1.1	Montague Center Park	Town of Montague	Parks and Recreation	Station St.	Good	Ballfield	High-upgrade park	Station St.	RS		Limited
43	119	0.2	Montague Center Park	Town of Montague	Parks and Recreation	Station St.		Maintenance shed	Low	Station St.	RS		Limited
43	121	1.0	Montague Center Park	Town of Montague	Parks and Recreation	School St.	Good	Ballfield, playground	High-upgrade park	School St.	RS		Limited
43	122	1.2	Montague Center Park	Town of Montague	Parks and Recreation	School St.	Good	Parking, wooded	Medium-upgrade park	School St.	RS		Limited
43	123	0.9	Montague Center Park	Town of Montague	Parks and Recreation	Rear School St.	Good	Community garden	High-upgrade park	School St.	RS		Limited
6	323	3.5	Montague Elementary School	Town of Montague	Gill Montague Regional School District	Crocker Ave.	Good	School, field	High-maintain field	Crocker Ave., Keith St.	RE		Limited
6	324	5.2	Montague Elementary School	Town of Montague	Gill Montague Regional School District	Crocker Ave.	Good	School, field, playground	High-upgrade playground	Crocker Ave., Keith St.	RE		Limited
6	325	2.0	Montague Elementary School	Town of Montague	Gill Montague Regional School District	Davis St.	Good	Field, school parking	High-maintain field	Davis St., Keith St.	RE		Limited
10	22	6.2	Montague Elementary School	Town of Montague	Gill Montague Regional School District	Montague St.	Good	Ballfields, school parking, playground	High-upgrade playground	Montague St., Crocker Ave.	RE		Limited
10	49	10.4	Montague Elementary School	Town of Montague	Gill Montague Regional School District	Griswold St.	Good	School, field, playground	High-upgrade playground	Griswold St., Keith St.	RE		Limited

Map	Lot	Acres	Site Name	Owner	Manager	Location	Condition	Current Use	Potential for recreation	Public Access	Zoning	Type of Grant Received	Level of Protection
33	31	8.4	Montague Plains WMA	Town of Montague	Selectboard	Northfield Rd.	Good	Wildlife mgmt. area	High-formalize trails	Lake Pleasant Rd.	ID		Limited
40	8	5.3	Montague Plains WMA	Town of Montague	Selectboard	Rear Northfield Rd.	Good	Wildlife mgmt. area	High-formalize trails	Lake Pleasant Rd.	AF		Limited
40	20	19.1	Montague Plains WMA	Town of Montague	Selectboard	Rear Northfield Rd.	Good	Wildlife mgmt. area	High-formalize trails	Lake Pleasant Rd.	RS		Limited
40	26	0.6	Montague Plains WMA	Town of Montague	Selectboard	Rear Northfield Rd.	Good	Wildlife mgmt. area	High-formalize trails	Lake Pleasant Rd.	AF		Limited
40	27	0.5	Montague Plains WMA	Town of Montague	Selectboard	Rear Northfield Rd.	Good	Wildlife mgmt. area	High-formalize trails	Lake Pleasant Rd.	AF		Limited
33	71	3.7	Norma's Park	Rocky River Realty Company	Parks and Recreation	Lake Pleasant Rd.	Good	Playground, ballfield	High-maintain park	Lake Pleasant Rd.	ID		Limited
3	33	1.9	Peskeomskut Park	Town of Montague	Department of Public Works	Avenue A	Good	Park, playground, outdoor performances	Additional events, concerts, movies	Avenue A, 6th and 7th Sts.	CB	Donation /CDBG	Limited
37	150	1.1	Rutter's Park	Town of Montague	Parks and Recreation	Broadway	Good	Playground, open space	High-upgrade park	Broadway, Montague Ave	RS	CDBG	Limited
3	42	1.1	Soldiers Memorial	Town of Montague	Selectboard	Avenue A	Good	Open space, walkway	Formalize pathways	Avenue A, hillside pathway	PS		Limited
43	79	0.4	Town Common	Town of Montague	Parks and Recreation	Main St.		Open space	Medium-maintain	Main St., Center St.	PS		Limited
17	15	10	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Industrial Blvd.	Good	Airport, riparian buffer	None	None	ID		Limited
17	21	2.4	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Industrial Blvd.	Good	Airport	None	None	ID		Limited
17	22	5.9	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport	None	None	ID		Limited
17	23	23.3	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport	None	None	ID		Limited
17	24	14.9	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Industrial Blvd.	Good	Airport, wooded	None	None	ID		Limited
17	25	34.6	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport	None	None	ID		Limited
17	26	10.3	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport	None	None	ID		Limited
17	38	8.0	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Industrial Blvd.	Good	Airport	None	None	ID		Limited
17	15A	11.8	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Industrial Blvd.	Good	Wooded	None	None	ID		Limited
24	1	7.2	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Wooded	None	None	ID		Limited
24	2	19.4	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport, open land	None	None	ID		Limited
24	3	9.3	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Open land	None	None	ID		Limited
24	4	6.6	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport, open land	None	None	ID		Limited
24	11	10.4	Turners Falls Muni. Airport	Town of Montague	Airport Commission	Millers Falls Rd.	Good	Airport, open land	None	None	ID		Limited
24	12	5.3	Turners Falls Muni. Airport	Town of Montague	Airport Commission	West Mineral Rd.	Good	Open land	None	None	ID		Limited
25	13	10.0	Turners Falls Muni. Airport	Town of Montague	Airport Commission	West Mineral Rd.	Good	Open land, wooded	None	None	AF-4		Limited
24	13	5.0	Adjacent to Airport	Town of Montague	Selectboard	Millers Falls Rd.	Good	Open land	None	None	ID		Limited
4	10	1.8	Unity Park	Town of Montague	Parks and Recreation	First St.	Excellent	Playground, park	High-maintain park	First St., Second St.	RE	CDBG, LWCF	Limited
4	11	0.3	Unity Park	Town of Montague	Parks and Recreation	First St.	Excellent	Parking lot for park	High-maintain park	First St., Second St.	RE	CDBG, LWCF	Limited

Map	Lot	Acres	Site Name	Owner	Manager	Location	Condition	Current Use	Potential for recreation	Public Access	Zoning	Type of Grant Received	Level of Protection
4	103	6.2	Unity Park	Town of Montague	Parks and Recreation	Third St.	Excellent	Ballfields, walkway, park	High-maintain park	First, Second, & Third Sts.	RE	CDBG, LWCF	Limited
4	12	0.2	Unity Skate Park	Town of Montague	Parks and Recreation	Second St.	Excellent	Skate park, community gardens	High-maintain park	First St., Second St.	NB	PARC, CDBG	Limited
6	85	0.8	Turners Falls hillside path	Town of Montague	Selectboard	L St.	Poor	Wooded hillside, pathway	Improve pathway, assess vegetation management	L St., High St.	RS		Limited
6	171	7.8	Turners Falls hillside path	Town of Montague	Selectboard	High St.	Poor	Wooded hillside, pathway	Improve pathway, assess vegetation management	High St., 7th St., Unity St.	RS		Limited
6	223	0.8	Roosevelt Park	Town of Montague	Selectboard	Roosevelt St.	Fair	Neighborhood open space	Medium, add sign, bench	Roosevelt St., Montague St., Stevens St.	RS		Limited
12	50	0.4		Town of Montague	Selectboard	Montague City Rd.	Average	Wooded lot	None	Montague City Rd., Masonic Ave.	CB		Limited
15	228	0.4		Town of Montague	Selectboard	Turnpike Rd.	Good	Paved pathway to school	Maintain pathway	Turnpike Rd., Vladish Ave.	RS		Limited
19	57	0.4		Town of Montague	Selectboard	Rod Shop Rd.	Fair	Vacant lot, bike path	Trailhead for bike path	Masonic Ave., Rod Shop Rd., bike path	RS		Limited
21	5	24.0		Town of Montague	Selectboard	Turners Falls Rd.	Good	Wooded	Walking paths	Turners Falls Rd.	PS		Limited
21	13	0.9		Town of Montague	Selectboard	Hillside Rd.	Good	Wooded; adjacent to school property	None	None	RS		Limited
33	29	0.6	Montague Plains Wildlife Management Area	Town of Montague	Selectboard	Lake Pleasant Rd.	Good	Wooded, adjacent to Montague Plains WMA	High-formalize trails	Lake Pleasant Rd.	ID		Limited
35	27	74.7	Hannegan Brook Conservation Area	Town of Montague	Selectboard	South Prospect St.	Good	Forested	Hiking trails, hunting	None	AF-4		Limited
35	31	10.6	Hannegan Brook Conservation Area	Town of Montague	Selectboard	South Prospect St.	Good	Forested	Hiking trails, hunting	None	AF-4		Limited
35	33	11.9	Hannegan Brook Conservation Area	Town of Montague	Selectboard	South Prospect St.	Good	Forested	Hiking trails, hunting	None	AF-4		Limited
35	34	11.4	Hannegan Brook Conservation Area	Town of Montague	Selectboard	South Prospect St.	Good	Forested	Hiking trails, hunting	None	AF-4		Limited
37	129	0.4		Montague Conservation Commission	Conservation Commission	Fifth Ave.	Good	Wooded	Low	None	RS		Permanent
44	69	6.0	Sawmill River Access Area	Town of Montague	Conservation Commission	Swamp Rd.	Good	Forested	High-maintain	North Street	AF	Resident fund-raising	Permanent
52	52	2.1	Sawmill River Access Area	Town of Montague	Selectboard	North Leverett Rd.	Good	Wooded, riparian area, powerline corridor	None	None	AF-4		Limited
53	44	15.8	Sawmill River Access Area	Town of Montague	Selectboard	Richardson Rd.	Good	Wetland, powerline corridor	Low	None	AF-4		Limited

Map	Lot	Acres	Site Name	Owner	Manager	Location	Condition	Current Use	Potential for recreation	Public Access	Zoning	Type of Grant Received	Level of Protection
13	68	27.8		Town of Montague	Selectboard	Turnpike Road	Good	Wooded	Walking trails	Sandy Lane	ID		Limited
20	27	24.2		Town of Montague	Highway Department	Turnpike Road	Good	Recycling center	Walking trails	Sandy Lane	ID		Limited
21	6	5.6		Town of Montague	Selectboard	Turnpike Road	Good	Capped landfill	Walking trails	Sandy Lane	ID		Limited
21	7	37.1		Town of Montague	Selectboard	Turnpike Road	Good	Capped landfill	Walking trails	Sandy Lane	ID		Limited
21	24	64.5		Town of Montague	Highway Department	Randall Road	Good	Wooded	Walking trails	Sandy Lane	ID		Limited

Source: Montague Assessors’ Office and Committee input.

Cemeteries

Table 5-15 lists all of the 12 cemeteries in Montague, seven of which are owned by the Town. Most cemeteries represent well-maintained open space areas that are sometimes appropriate for walking and bird watching. Access to Dry Hill Cemetery was the subject of ongoing discussion between the Town of Montague and the private landowner. The Town completed a feasibility study in 2008 with options to improve access, and in 2016 completed the Dry Hill Cemetery Trail as part of the Dry Hill Trail System. The trail follows a historic road to the cemetery.

Table 5-15: Cemeteries in Montague

Cemetery	Map	Lots	Acres	Owner
Aaron Clark Memorial	21	10	10.9	Aaron Clark Memorial Cemetery
Burnham Cemetery	13	34	0.5	Town of Montague
Dry Hill Cemetery	46	27	1.0	Town of Montague
East Mineral Road	25	15	0.5	Town of Montague
Elm Grove	42	26	1.1	Elm Grove Cemetery
Elm Grove	42	27	1.1	Elm Grove Cemetery
Elm Grove	42	81	0.1	Elm Grove Cemetery
Elm Grove	42	32	5.1	Locust Hill Cemetery
Fairway Avenue	13	88	0.3	Town of Montague
Old South	48	25	1.5	Town of Montague
Our Lady of Czestochowa	22	36	4.3	Roman Catholic Bishop of Springfield
Springdale	21	4	13.2	Springdale Cemetery
St. Mary's	21	8	11.6	Roman Catholic Bishop of Springfield
St. Mary's	21	9	10.7	Roman Catholic Bishop of Springfield
Town Farm	34	58	0.3	Town of Montague
West Chestnut	53	29	0.4	Town of Montague

Source: Montague Assessor's Office.

C. PARK AND OPEN SPACE EQUITY

As discussed in Section 3: Community Setting, areas of Turners Falls, Montague City and Millers Falls qualify as an Environmental Justice Population area, where median household incomes are below 65% of the state median household income (\$62,072 in 2010) according to the 2010 U.S. Census. According to the Massachusetts Department of Environmental Protection, “Environmental Justice is based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment. Environmental justice is the equal protection and meaningful involvement of all people with

respect to the development, implementation, and enforcement of environmental laws, regulations, and policies, and the equitable distribution of environmental benefits.”⁵ Residents may be unable to afford recreational opportunities that require a fee, and may lack transportation to open space and recreation resources in other areas of Town. It is therefore important to ensure free access to an equitable distribution of well-maintained open space and recreational resources within walking distance of homes in these areas.

The *Turners Falls Livability Plan* was completed in 2013, and includes strategies to improve the physical and economic environment in downtown Turners Falls, including recreation and open spaces. The planning process included multiple public engagement opportunities as well as outreach meetings with youth and members of the Spanish-speaking community in Turners Falls. A summary of public feedback on open space and recreation in the village revealed that many residents are happy with the existing parks, but that there is a need to focus on more recreation programming and activities. Feedback also identified the following needs: make key connections between sidewalks and pathways and make crosswalks safer; access to the Connecticut River, including a boat launch; the need to pursue a Native American Cultural Park; more community garden spaces; a place for families to swim; and a dog park.

Feedback from youth regarding open space and recreation included a desire to see the skate park built (which has since been completed) as well as improved basketball courts, volleyball courts, soccer and softball fields, extending the bike path to neighboring communities, connecting pedestrian paths and short cuts, and making paths safer, creating a teen club/coffee house/recreation center, and the desire for a YMCA-type swimming pool, gym, boxing, etc. Youth also had ideas for re-use of vacant mills in downtown, including a YMCA or gym, batting cages, and mini-golf. Feedback from the Spanish-speaking population revealed the importance of existing community spaces like parks, libraries, and community centers, as well as a desire for more public gathering spaces and activities for children. Mobility issues for those without a car were identified, highlighting the necessity of locating open space and recreation resources within close walking distance of residents. Having a grocery store within walking distance was also identified as critical for family food security.

Highland Park is located on Lyman Street in Millers Falls, and includes a baseball field, basketball court, picnic area, and playground. It is located on a hill above the village center. A sidewalk leads from the village up Millers Falls Road to Lyman Road and a stairway provides access from West Main Street to Grand Avenue. The topography of Millers Falls may make the

⁵ Massachusetts Department of Environmental Protection (DEP) Environmental Justice webpage: <http://www.mass.gov/eea/agencies/massdep/service/justice/>, accessed March 9, 2017.

park difficult to access by walking or bicycling for some residents. The Town is in the preliminary planning stages of creating a river access area in Millers Falls off of Newton Street that would include a boat ramp and fishing access to the Millers River. The Town is also interested in protecting the oxbow on the Millers River located just west of the village. If protected, it is envisioned that public access to the site would be provided.

Cabot Camp is located at the end of East Mineral Road at the confluence of the Millers and Connecticut Rivers. The property is currently owned by FirstLight Power, which provides river access at the site. The site also includes historic buildings and foundations which are not accessible to the public. The Town is interested in protecting this site for its scenic, historic and recreational value.

Montague City remains the only village in Montague without a public park. The Canalside Trail travels through the village, and improvements were made in 2016 to the bike path crossing at Montague City Road. In 2010, the Town conducted a Phase I Environmental Site Assessment on a Town-owned parcel at the corner of Rod Shop Road and Masonic Avenue to assess whether the site may be contaminated from former nearby industrial uses. The purpose of the assessment was to determine the feasibility of the site for a small park and/or trailhead for the bike path, which is adjacent to the parcel. The assessment did not find any contamination, and the site remains a possibility for the creation of a small park.

While access to recreation and open space opportunities within Environmental Justice areas is critical, residents also need access to other villages and surrounding towns for jobs, shopping, and services. The Turners Falls Livability Plan noted that while Turners Falls itself is very walkable, getting to and from the village from surrounding areas without a car can be challenging. Feedback from the public identified a need for more frequent bus service, particularly the addition of evening and weekend buses, to better serve the community. A lack of sufficient sidewalks and bike lanes make it difficult to access the village from most directions (the plan notes that access to Montague City is excellent via the Canalside Trail). In particular, access to Greenfield is an issue. Turners Falls Road in Greenfield is a common route for pedestrians and cyclists travelling between Turners Falls and Greenfield, however, the road has no sidewalk and limited shoulder space. In addition, cars travel fast down the hill, contributing further to the unsafe conditions. The Town of Greenfield has been exploring options to improve safety along this stretch of road, but to date there are no planned improvements.

Access to Greenfield via the General Pierce Bridge in Montague City is also an issue. Currently the bridge deck is in major disrepair, making it difficult for pedestrians and bicyclists to traverse. The bridge is scheduled for rehabilitation through the Transportation Improvement

Program in 2019. Including pedestrian and bicycle accommodations over the bridge should be incorporated into the project.

Montague has many recreational assets, however it appears there is a need to better connect the village parks and open spaces with the passive recreation opportunities located outside of village centers. Off-road trails, sidewalks, and on-road bicycle improvements could all be explored as options to improve access between recreation opportunities and neighborhoods. Montague could explore developing a Complete Streets policy that would seek to improve pedestrian, bicycle, and transit access as part of roadway projects. The State's Complete Streets program currently offers funding to communities who adopt a policy for planning and implementation of Complete Streets projects.

Town of Montague

Open Space and Recreation Plan

Open Space

Legend

- Town Boundary
- Road
- Rail Line
- Wetlands
- Stream, River
- Pond, Lake

Permanently Protected

- Town Owned
- Water/Fire District
- Privately Owned
- State Owned

Chapter 61 Lands

- Chapter 61F (forest)
- Chapter 61A (Agriculture)
- Chapter 61B (Recreation)

Utility Parcels

- Unprotected Utility Lands

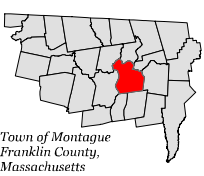
Limited Protection

- Limited Protection

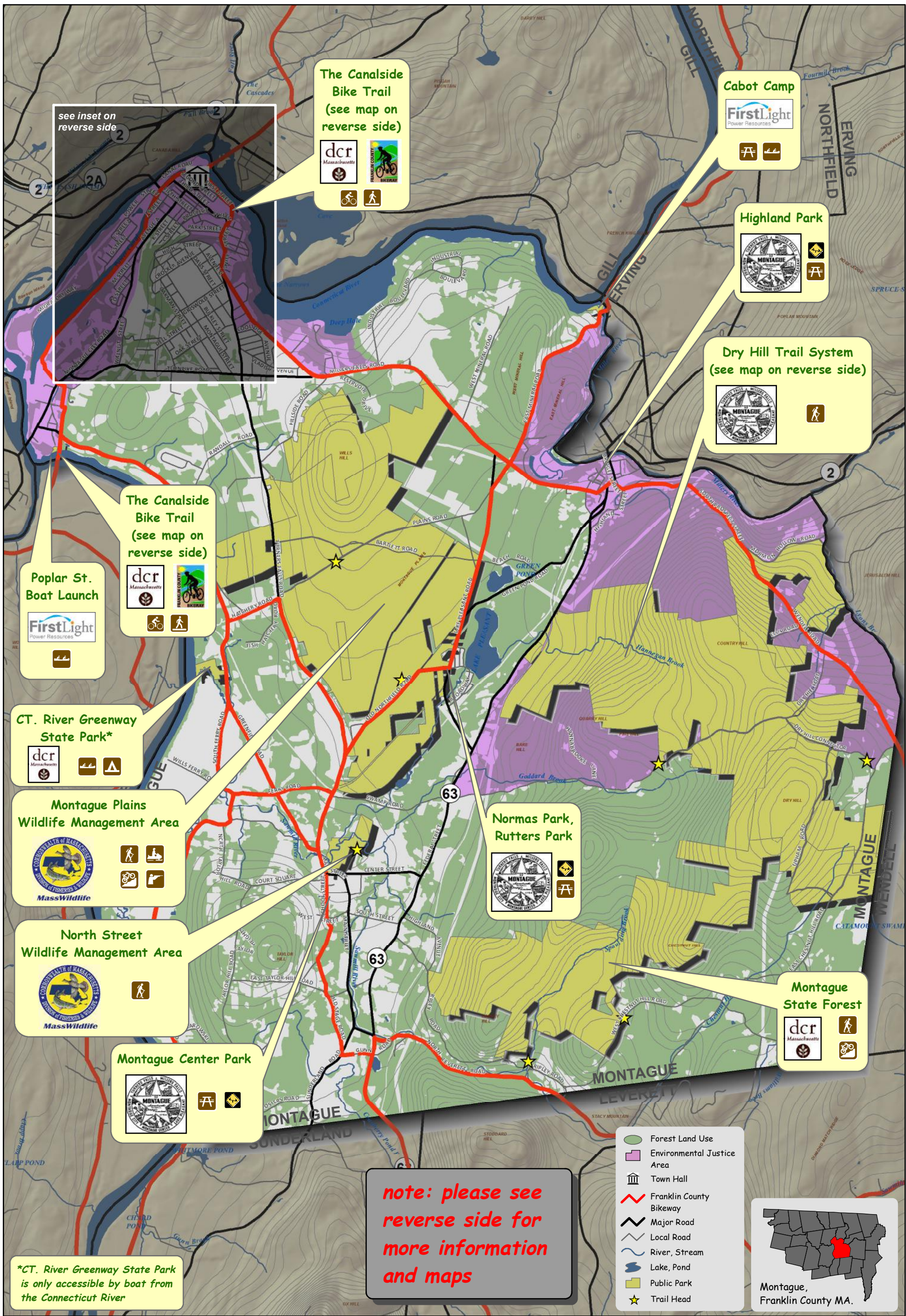


0 0.25 0.5 1 Miles

March, 2017



Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



Access to Off-Road Recreation Activities Montague, MA

0 0.5 1 2 Miles



frco Franklin Regional Council of Governments

Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS, FRCOG, Franklin Land Trust, Trustees of Reservations. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.

Popular Hiking and Walking Areas in Montague

Walking Area	Trail type and markings	Terrain	Miles of trails	Trailhead(s)	Description
Dry Hill Trail System	Marked hiking trails Hannegan Brook Loop (Blue) Dry Hill Cemetery (white)	challenging	7	-Kiosk at End of Dry Hill Rd from Route 63. -Kiosk at East Chestnut Hill Road from Wendell Rd	1000+ acre watershed owned by Turners Falls Fire District. Historic road to Dry Hill Cemetery
Cabot Woods	Unmarked trails and paved shared use roadway	moderate	2	Parking area at end of G Street	Access to Connecticut River and Power Canal provided by FirstLight Power Resources LLC
North Street Wildlife Management Area	Unmarked hiking trails	easy	1	End of North Street (No parking on North Street)	Access to Sawmill River on 60 acres owned by Mass Division of Fisheries and Wildlife
Montague Plains Wildlife Management Area	Unmarked trail network	moderate	10+	Plains Road Lake Pleasant Rd Millers Falls Rd	1,600+ acre sandplain habitat owned by Mass Division of Fisheries and Wildlife
Canalside Rail Trail	Paved Share-use bike path	easy	3	Unity park, First St, Eleventh St, Depot Street, Greenfield Road	Connects Turners Falls to Deerfield. Owned by Mass Department of Conservation and Recreation
Robert Frost Trail	Marked regional hiking trail- (orange)	challenging	5	-Kiosk at East Chestnut Hill Road from Wendell Rd -Trailhead off North Leverett Rd, near Spaulding Brook	Trail crosses public and private land on its 43 mile journey from South Amherst to Wendell state forest

Each area has its own rules, but it always good to be aware of hunting seasons, to wear safety orange, to carry out all trash and to keep dogs on a leash where required.



Produced by Montague Planning and Conservation Department 9/13/2016.



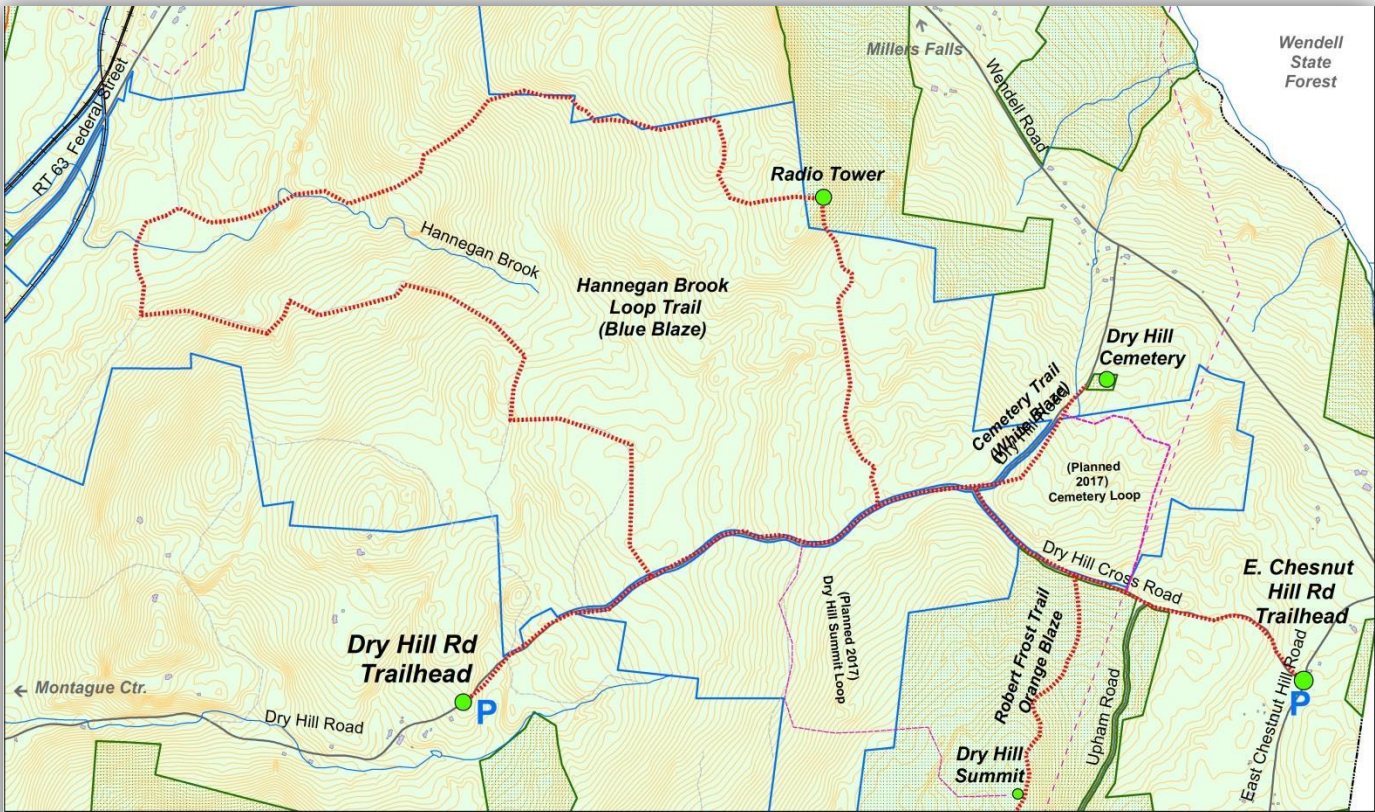
North Street WMA



Canalside Rail Trail



Dry Hill Trail System



Dry Hill Public Trail System

Produced by Montague Planning and Conservation Department for informational purposes. All boundaries are approximate.



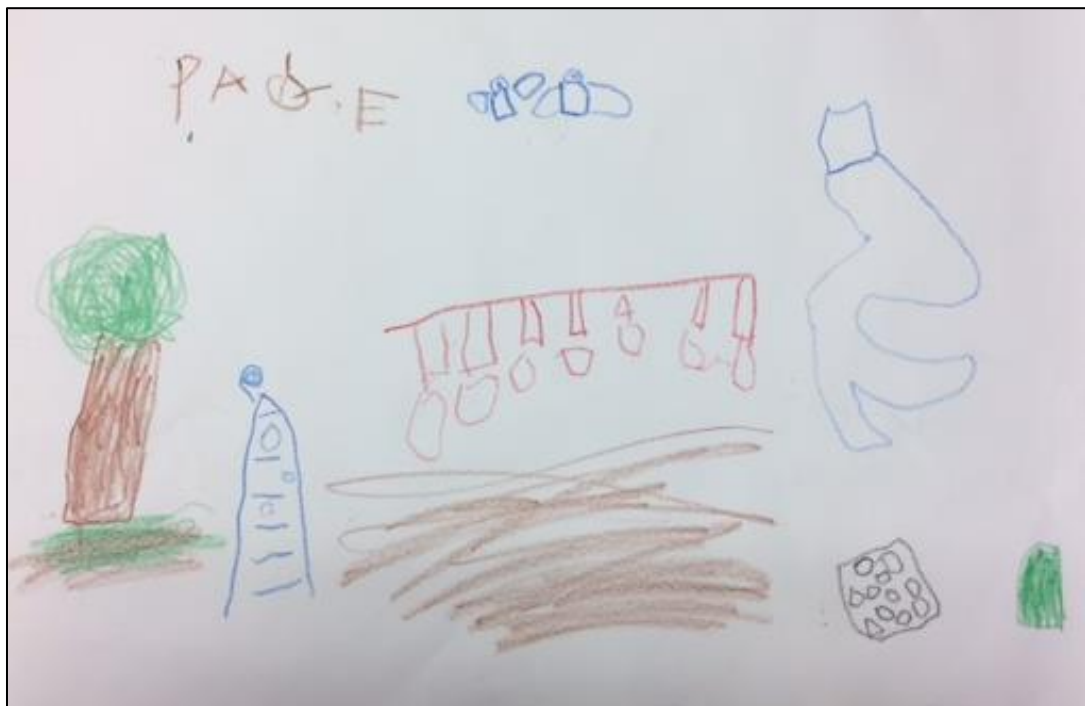
0 0.25 0.5 Miles

- Turners Falls Watershed Protection Land
- Montague State Forest



- Recreation Type**
- Biking
 - Hiking
 - Park
 - Playground
 - Sports
 - Fishing Access
 - Attraction
 - Sidewalks
 - Structures
 - Wooded Area
 - Offroad Bike Route
 - Environmental Justice Area

SECTION 6: COMMUNITY VISION



SECTION 6

“I do not believe any equal plot of New England ground has had so many varied visions, at different times, under such varied circumstances, of a golden age waiting for it in the future” (Pressey, 1910).

COMMUNITY VISION

A. DESCRIPTION OF PROCESS

The Town of Montague’s 2017 open space and recreation goals were developed through the following planning process:

- In September and October 2016, Open Space and Recreation Surveys were made available electronically on the Town’s website and as hard copies at the Town Hall, the three libraries, and the senior center. A notice was also posted in the newspaper to alert residents of the survey. Surveys from 206 residents were returned (See Appendix for a copy of the survey and results). 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 and needs most important to Montague residents.
- From September 2016 to June 2017, the Montague Town Planning and Conservation Department, Montague Conservation Commission, and staff from the Franklin Regional Council of Governments developed this update to the Open Space and Recreation Plan. The Montague Parks and Recreation Department also reviewed the plan and provided input during the update process. The planning process used several methods for involving public participation:
 - The results of the 2016 Open Space and Recreation Survey were used as a basis for the development of goals and objectives as well as the overall open space and recreation vision.
 - Nine public meetings were held by the Conservation Commission during which the plan sections and maps were reviewed and updated.
 - A public forum was held on May 31, 2017, where key findings from the update process were presented, and participants used stickers to choose their top action items listed under each open space and recreation goal. The forum was recorded

live on Montague Community Television, and available for viewing online. Posters with the goals and action items were available in the Town Hall for a week after the forum for residents to choose their top action items. The prioritization exercise lead to the identification of priority action items in the Seven-Year Action Plan. All public comments from the forum and noted on the posters were recorded and considered for incorporation into the plan.

B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS

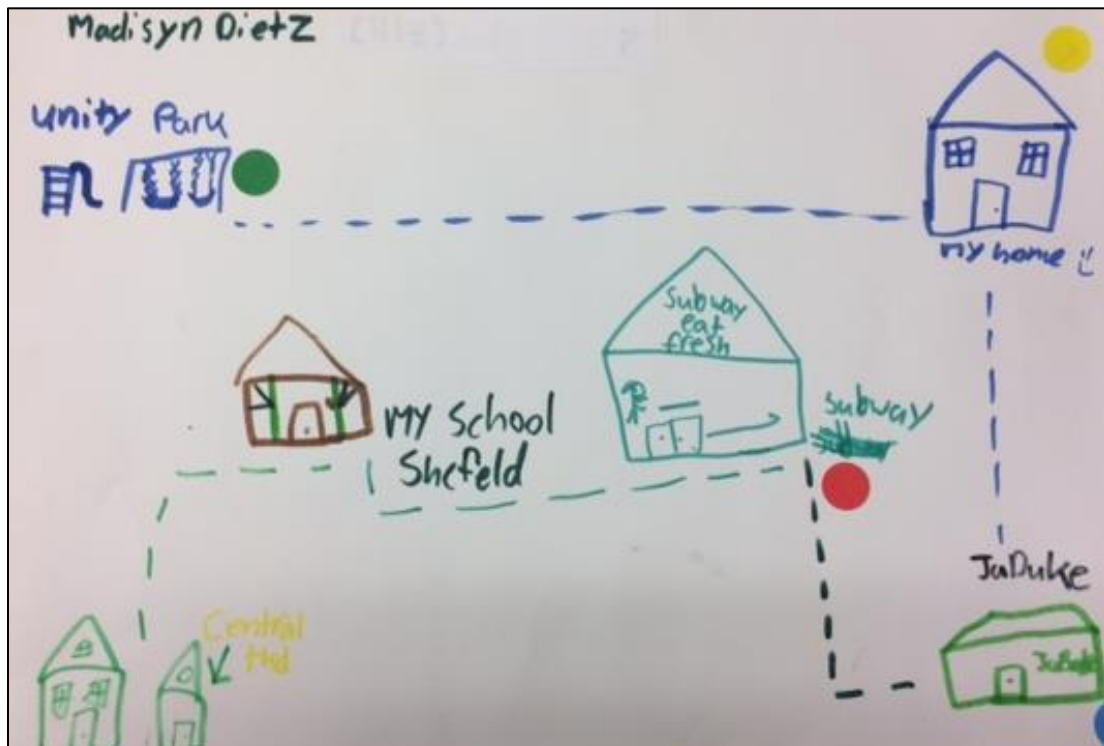
Residents who responded to the Open Space and Recreation Survey and participated in the process of developing this plan have a vision for the future of Montague's natural, agricultural and recreational resources. Montague residents appreciate the town's historic villages and rural character. They value Montague's diverse landscapes, which include a mix of farms, extensive forests, hillsides and river corridors that provide many scenic views. They like living in a town with clean air and water, a great diversity of native plants and animals and abundant opportunities for outdoor recreation.

In the future, the Town's uninterrupted forests and the banks of the Connecticut, Sawmill and Millers Rivers will be permanently protected as a result of cooperative efforts between residents, private landowners, local and state agencies and private non-profit organizations. The town's rivers and streams will be clean enough for fishing and swimming. Residents will continue to enjoy ample supplies of high-quality drinking water, but they will have learned not to take this precious resource for granted. Agricultural and forestry businesses will be thriving on land dedicated to these uses, and residents will take satisfaction in eating fresh vegetables, fruit and meat produced close to home, and buying nursery and forest products raised by their neighbors.

Residents of all ages, abilities, and income will enjoy the town's well-maintained recreational facilities, including parks in all five villages, multiple river access points, and an outdoor swimming facility. Performances and events will draw crowds to town and contribute to the local economy. An accessible system of recreational trails will connect well-known and well-cared for public and privately-owned open space and recreational facilities. Village centers will be vibrant, attractive places to gather, with well-maintained sidewalks and inviting public spaces under the shade of a healthy urban tree canopy. Residents will speak proudly of their successful efforts to maintain and restore historic buildings in each of the villages.

There will be a diverse mix of prosperous businesses in downtown Turners Falls and Millers Falls, catering to the needs of both residents and tourists who have come to visit the Great Falls Discovery Center, bike along the Canalside Rail Trail, hike and hunt on the Montague Plains and the forests east of Federal Street. Residents will enjoy a high quality of life and municipal services at a reasonable cost, due to their smart decisions to invest in agriculture and forestry, protection of natural resources, the preservation of historic neighborhoods, brownfields redevelopment and sustainable industrial development.

SECTION 7: ANALYSIS OF NEEDS



SECTION 7

ANALYSIS OF NEEDS

This Open Space and Recreation Plan incorporates an inventory of natural, scenic, agricultural and recreational resources in Montague (Sections 3 and 4) and identifies the most important parcels of land that contain these resources (Section 5). Based on the community's general goals (Section 6) the plan compares the supply of land and resources with the demand for services related to those resources (Section 7).

This section summarizes the recreation and open space needs of residents, which are identified using the 2016 Open Space and Recreation Survey, data presented in Sections 3 and 4, and the Park and Open Space Equity assessment in Section 5. Finally, obstacles to effective fulfillment of these needs are addressed, including organizational barriers and the most significant land use conflicts concerning open space and natural resource use.

A. SUMMARY OF NATURAL RESOURCE PROTECTION NEEDS

Montague residents value farms and forests, surface and groundwater resources, wildlife habitat, native plant communities, the Connecticut, Millers, and Sawmill Rivers, scenic views, and special publicly-owned conservation lands such as the Montague Plains. According to the 2016 Open Space and Recreation Survey, residents believe that the Town's highest natural resource protection priorities should include the following: 1) drinking water resources (69% of respondents); 2) productive farmland/ encouraging agriculture (59% of respondents); 3) land along rivers and streams (53% of respondents); and 4) land for wildlife habitat (53% of respondents).

Fortunately, these priorities are highly compatible. A significant amount of active farmland is located in or near the Connecticut River floodplain in southwestern Montague. Montague's forests help protect the quantity and quality of water in aquifers by providing water retention and by slowing the release of stormwater to streams to permit groundwater recharge. These priorities are also consistent with the Town's continued focus to protect prime farmland, riverfront areas, and contiguous forestland.

A.1. Prime Farmland

Montague has implemented several important measures since the last OSRP to protect farmland in town. Montague re-activated the Agricultural Commission, adopted a Right-to-Farm bylaw, and maintains a Conservation Fund to help support Agricultural Preservation Restriction (APR) projects in town. The APR program offers to pay farmland owners the difference between the "fair market value" and the "agricultural value" of their farmland in exchange for a permanent deed restriction, which restricts any use of the property that will have a negative impact on its agricultural viability.¹ The APR program also helps keep farmland affordable for the next generation of farmers, as the land must be sold for its agricultural value, rather than its development value.

Since the 2010 OSRP, approximately 161 acres of farmland in Montague have been permanently protected, adding to a total of roughly 1,388 acres of farmland in Montague permanently protected from development. This accounts for approximately 46% of farmland in town. Another 1,312 acres of farmland are enrolled in the Chapter 61A program, where the land is assessed at its agricultural value rather than its development value. While these lands are temporarily protected from development, they are still at risk for conversion to another use.



In particular, the Town has identified unprotected prime farmland along the Connecticut and Sawmill Rivers in the southwest section of town as a priority for protection. The easily developable soils and the relatively close commuting distance to Amherst make this area of town susceptible to residential development. The Town could establish a list of the

parcels in this area currently under the Chapter 61 program, and work to take action if any were to become available for purchase through the Town's right of first refusal. The Town may also want to explore changing the zoning in this section of town to better support the protection of farmland.

¹ Massachusetts Agricultural Preservation Restriction Program: <http://www.mass.gov/eea/agencies/agr/land-use/agricultural-preservation-restriction-program-apr.html>.

In addition, the Mt. Grace Land Conservation Trust has identified a need to help smaller family-run farms with protecting their land. These farms may be too small for the APR program, but represent an important component of the regional farm and food system. A need also exists to assist farmers with farm transition and estate planning, which will ensure continued agricultural use of the land. Farms can also be “protected” by remaining economically viable. Local markets for farm products, including farmers markets, cafes and restaurants, and food coops and grocery stores, help support farms while at the same time increase access to fresh food and contribute to the revitalization of the community.

A.2. Riverfront Areas

Protecting land along rivers and streams provides multiple benefits. Riparian buffer areas help protect water quality by filtering and slowing stormwater runoff from adjacent land uses, and supports habitat for species that rely on cool water temperatures. Protecting floodplains allows a stream or river to flood without danger to property or infrastructure, and helps reduce flooding impacts downstream. Permanently protected land along rivers can also provide public access, depending on whether it is publically or privately owned, and the details of the restriction on the property. Improving and expanding river access in Montague is a priority for the Town, and was noted as a desire by many respondents to the 2016 Open Space and Recreation Survey.

While much of the land along the Connecticut River south of Montague City is permanently protected from development, almost all of the land along the river north of Montague City Road is owned by FirstLight Power Resources, and is subject to the utility’s FERC license for operating hydropower facilities on the river. One of the Town’s requests as part of the current FERC relicensing process is for an increase in water flows in the stretch of the Connecticut River that is bypassed by the power canal. Additional flow would better support migratory fish habitat, as well as recreational opportunities. The Town’s priorities for river access and recreation are discussed in more detail in the Community Needs section below.

Evidence of extreme erosion in the “Turners Falls Pool” segment of the Connecticut River, which encompasses the length of the river from the Northfield Mountain Pumped Storage Facility to the Turners Falls Dam, prompted the creation of the Connecticut River Streambank Erosion Committee and the development of an Erosion Control Plan, completed in 1999. Since the Erosion Control Plan, FirstLight Power has been required to perform a regular inventory of riverbank conditions, which is published as the Full River Reconnaissance report. Working with the utility, the Connecticut River Streambank Erosion Committee uses this report to

prioritize sites for repair. To date, approximately 19,000 linear feet of riverbank have been reconstructed and repaired. As part of the FERC relicensing process, the Franklin Regional Council of Governments and the Connecticut River Conservancy (formerly the Connecticut River Watershed Council) are pushing for modifications to how the hydropower facilities are operated to reduce erosion of the riverbank. The two organizations would like to see a comprehensive river management plan completed that would address erosion issues as well as habitat and recreation along the river. The Town should continue its involvement in the regional Connecticut River Streambank Erosion Committee and collaborate in the development of a river management plan, if one is to be created.

Protecting land along the Millers River is a priority for the Town, as most of the river in Montague is not protected. Cabot Camp is a FirstLight Power Company property that the Town would like to see permanently protected. Located at the confluence of the Connecticut and Millers Rivers, this area has historic, scenic, and recreational value to residents. In addition to Cabot Camp, the Town is interested in protecting the oxbow on the Millers River located just west of Millers Falls. If protected, it is envisioned that public access to the site would be provided. The Town is also in the preliminary planning stages of creating a river access area in Millers Falls off of Newton Street that would include a boat ramp and fishing access to the river.



The Sawmill River provides an example of how a river may respond to alterations and encroachments on riparian areas. Development, road infrastructure, and agricultural activity in and around Montague Center, combined with past efforts to “fix” flooding problems through dredging and channelizing the river, have resulted in erosion, sedimentation, and continued flooding problems along the lower reaches of the river.

Invasive species have also become a problem in recent years. In 2012 the Franklin Conservation District with support from the Montague Conservation Commission implemented an innovative restoration project that reconnected a portion of the river to its natural floodplain and implemented in-channel techniques which should reduce sediment transport and improve aquatic habitat, channel stability and floodplain sediment storage. The effectiveness of these techniques should be monitored to help inform future restoration projects on the river. In addition, protecting the riparian corridor and controlling development in the mostly forested upper reaches of the Sawmill River and its tributaries will help sustain fisheries, preserve wildlife habitat, improve water quality and prevent costly damage to public infrastructure and private property from flooding in the future.

A.3. Contiguous Forestland

Montague is roughly 70% forested. Most of the permanently protected land in town is forested, and is either owned by the State or Montague Conservation Commission, is in private ownership, or is owned for water supply protection purposes. Large areas of contiguous forestland provide habitat for a wide variety of wildlife species, and offer opportunities for creating recreational trail networks, such as the Montague Plains or Dry Hill Conservation Area trails. Forests also protect the tributaries of the Town's rivers, ponds, and lakes, provide clean air and drinking water, sequester carbon, and represent a significant scenic backdrop.

The Turners Falls Fire District owns and controls approximately 1,512 acres of land, roughly 8% of land in Montague. This watershed land provides a critical connection between protected forest east to the Quabbin Reservoir, and west across the Montague Plains to the Connecticut River. Depending on how these lands were acquired, some parcels may not be protected and could be sold. More research is needed to determine which parcels of Fire District land are permanently protected. An identified priority for additional protection is the forest land just east of Lake Pleasant and Green Pond, where the corridor of protected land is narrow and encompasses two railroad lines and Route 63. Broadening this area of protected land would help promote a more viable wildlife corridor and further protect the public drinking water supplies.

The Montague Plains is a unique forest ecosystem. According to the 2016 Survey, 52% of respondents use the Plains for recreational purposes. In addition to recreational value, the Plains provide extensive forest habitat, scenic views, and recharge for a large, high-yield aquifer. Illegal dumping degrades the value of all natural resources on the Plains, but is particularly problematic for groundwater quality. Dumped hazardous materials, including petroleum products and solvents, can contaminate groundwater. Erosion due to illegal use of ATVs on the Montague Plains has also been particularly severe. The Town needs to take a proactive role in helping the state Department of Fish and Game develop a management plan that addresses access and dumping issues on the Plains.

Engaging landowners in the stewardship of their forestland can help keep forests from being developed. Sustainable forest management can provide income to landowners while maintaining or improving the benefits those forests provide. Forest-based business activities like timber harvesting benefit landowners, foresters, loggers and buyers of wood products, as well as the Town, which receives tax revenues from timber sales. As forest landscapes become fragmented through residential development, however, commercial harvest of timber becomes more difficult. Access to remote parcels may be lost, and new residents who have moved to the

area to appreciate the beauty of the forest may object to the use of chainsaws, skidders and other logging equipment. As timber harvesting becomes more difficult and less profitable, the incentive to sell land for development increases. The Town can collaborate with local land trusts, the MA Department of Conservation and Recreation, and MassWoods (UMass Amherst Extension Service) to provide information to forest landowners about the choices they have for managing and protecting their land.

Scenic views are also considered to be very important and their protection is included in the goals of this Open Space and Recreation Plan. Long-range scenic views in Montague include vast areas of forest in the eastern section of town in the vicinity of Quarry Hill and Dry Hill, and of agricultural landscapes in southwestern Montague and off East Mineral Road. The quality of scenic views and Montague's rural character will likely be diminished if future development fragments these landscapes. (*See the Scenic Resources and Unique Environments map in Section 4*).

B. SUMMARY OF COMMUNITY'S NEEDS

Planning for open space and recreation needs in Montague must satisfy the present population's desires for new facilities, spaces, and services, and interpret and act on the available data to prepare for the future needs of the citizenry. Although this Plan will be updated in seven years, the types of actions that are identified in Section 9 should take into account the needs of the next generation as well.



Unity Park is one of the most-used recreation resources by residents, and attracts visitors from nearby communities as well.

Presently, Montague's recreation needs fall into the following categories: 1)

Maintain existing facilities and increase programs and the accessibility of these programs and facilities to all residents; 2) Develop an outdoor swimming area in town; 3) Improve river access; and 4) Develop bicycle and multi-purpose trails that connect villages, parks, and open spaces.

B.1. Maintain Existing Facilities and Increase Programming

Many of Montague's existing parks and open spaces are well-utilized by residents. According to the 2016 Open Space and Recreation Survey, the Canalside Trail Bike Path, Unity Park, the Great Falls Discovery Center, and the Montague Plains Wildlife Management Area were all utilized by over 50% of survey respondents. Since the last Open Space and Recreation Plan, the Town has accomplished many improvements to parks and open spaces, such as the complete refurbishment of Unity Park and the creation of the Unity Skate Park. The Montague Parks and Recreation Department (MPRD) has completed a plan for improvements to Rutter's Park in Lake Pleasant, and applied for design funding through the Community Development Block Grant program in spring 2017. Planned improvements at the park include a new playground, picnic shelter, basketball court, community garden beds, and defined parking, as well as a large, open space and site amenities that include picnic tables and benches. The MPRD is also beginning a needs assessment for improvements to the Montague Center Park, and held a public meeting in spring 2017 to gather feedback from residents.

According to the 2016 Open Space and Recreation survey, 57% of respondents thought that maintaining existing recreational facilities should be the Town's highest recreation priority. Keeping existing recreational facilities in good shape makes sense, because it is less expensive to maintain infrastructure than it is to replace it. This is also consistent with feedback from the 2013 Turners Falls Livability Plan, which includes a summary of public feedback on open space and recreation in the village. According to the plan, many residents are happy with the existing parks, but feel there is a need to focus on more recreation programming and activities, especially for children. Thirty percent (30%) of respondents to the 2016 survey also felt that increasing recreational programming for children should be a high priority. Twenty seven percent (27%) of respondents felt that increasing programming for adults should be a high priority.



*Montague Public Library programming.
Photo credit: Linda Hickman*

As Montague's population ages, improving accessibility at all Town parks and recreation facilities will continue to be a need. Recent upgrades of parks and facilities have included ADA improvements and incorporation of accessible features for seniors and people with disabilities, such as accessible community garden plots and a wheelchair swing at Unity Park. The Town

will continue to incorporate accessibility improvements into park and open space projects to promote access for all residents.

While maintaining existing facilities is important, feedback from youth during the Turners Falls Livability Plan revealed additional recreational needs, including improved basketball courts, volleyball courts, soccer and softball fields, extending the bike path to neighboring communities, connecting pedestrian paths and short cuts and making paths safer, and a desire for a teen club/coffee house and a YMCA-type recreation center. Feedback from the Spanish-speaking population revealed the importance of existing community spaces like parks, libraries, and community centers, as well as a desire for more public gathering spaces and activities for children. Mobility issues for those without a car were identified, highlighting the necessity of locating open space and recreation resources within close walking distance of residents. In addition, the need to create a safe outdoor swimming area continues to be a consistent message from residents.

B.2. Develop an Outdoor Swimming Area in Town

Forty two percent (42%) of survey respondents identified developing an outdoor swimming facility in town as a top recreation priority. Developing a new outdoor swimming facility is likely to be difficult in the short term. There is no consensus on where such a facility should be located, and development and maintenance of a swimming area is likely to be expensive. This does not mean, however, that residents should give up on their desire for a safe outdoor public swimming area.

To try to meet this need, the Town provides swimming programs at the Turners Falls High School pool, and offers transportation to swimming areas in other towns during the summer months. A spray element was also added as part of the upgrades to Unity Park, and is very popular during the summer.

As a result of the survey feedback, the Montague Parks and Recreation Commission has formed a sub-committee to re-evaluate possible outdoor swimming opportunities in town. The Town may want to create a list of properties that could offer the potential for a public swimming area if one were to become available for purchase. According to the 2016 survey, if the Town had an outdoor swimming facility, 30% of respondents would be willing to pay \$50 or less a year for a family permit, 30% would pay between \$50 - \$99, 7% would pay between \$100 - \$149, and 3% would be willing to pay \$150 - \$200 a year.

B.3. Improve River Access

Improving river access points was identified by 36% of respondents to the 2016 Open Space and Recreation survey as a top recreation priority. FirstLight Power Resources currently maintains a canoe launch at the end of Poplar Street in Montague City, a park and picnic area along the river in Turners Falls, and fishing access at Cabot Woods and Cabot Camp as part of the utility's Federal Energy Regulatory Commission (FERC) license to operate hydropower facilities on the river. Nevertheless, the company's control of a large amount of land along the Connecticut River in Montague constrains recreational opportunities for residents. The Poplar Street canoe launch has a very steep grade and limited parking, and is not accessible to older residents or people with disabilities. In addition, the Town would like to see the development of additional opportunities for non-motorized boating in appropriate areas along the Connecticut River in Montague.

Through the current FERC relicensing process, the Town has requested improved recreational access to the Connecticut River for residents. Specific improvements include: maintaining an acceptable minimum flow in the bypass reach of the Connecticut River for recreation, such as white water rafting, and to support fish habitat; and providing Montague residents with adequate, user friendly public access points to the Connecticut River for recreation, especially adding a put-in below the Turners Falls Dam, adding cartop boat access at Unity Park, providing foot access to the Rock Dam, implementing accessibility improvements to the Poplar Street boat launch, and adding cartop boat access at Cabot Camp.

These improvements would provide much needed recreational access to the Connecticut River. In addition, as noted previously, the Town is in the preliminary planning stages of creating a river access area in Millers Falls off of Newton Street that would include a boat ramp and fishing access to the Millers River.

B.4. Develop Bicycle and Multi-Purpose Trails

It makes sense to locate parks and playgrounds near neighborhoods that have the highest densities. As the population of Montague continues to age, seniors may be looking for better access to green spaces and walking paths near village centers—hiking trails in remote areas of town do not meet the needs of all residents. Attention to linking parks to where people live and play could involve a greening of urban areas, improving livability for all residents. The Canalside Trail Bike Path in Turners Falls, completed in 2008, is a good example of a facility that provides a much needed recreational resource. Seventy four percent (74%) of respondents to

the 2016 Open Space and Recreation Planning Survey stated that they or their family use the path, making it the most heavily used outdoor recreation area in the Town.

Forty two percent (42%) of survey respondents identified developing walking trails as a top recreation priority. The Town has identified several areas where new trails could be developed within close proximity to residential neighborhoods. Town-owned land off of Turnpike Road is planned for a new industrial park and solar array. Trails could be developed within wooded areas around the perimeter of the site that will be preserved. The Town also would like to see the land surrounding the oxbow on the Millers River permanently protected with public access provided via trails.

Input from the 2013 Turners Falls Livability Plan also identified the need to improve existing pathways in the village, and to provide safer bicycle connections between villages and neighboring communities. Both off-road and on-road connections could be explored. Improving bicycling infrastructure throughout town would also further support bicycle tourism in Montague.

Trails traversing the Montague Plains, if formalized and marked, could connect the scenic farm landscapes of southwestern Montague to the breathtaking views from Dry Hill. Hiking and bicycle trails on the Plains could overlap and be tied to existing trails in the region and be used by both residents and tourists. Specifically, a need to connect the trails on the Plains to the Dry Hill Trail System on the eastern side of Route 63 was identified during the OSRP update process.

Montague has many existing trails, but does not have coordinated trail maps and information for residents and visitors. In addition, some areas of town do not have clearly marked trail heads. In particular, the southeastern corner of town, which encompasses a combination of the Montague State Forest and the Montague Wildlife Management Area, lacks clearly marked access points. Trailheads off of Ripley Road and West Chestnut Hill Road could be improved with signage, trail maps, and formal parking to encourage use of these outdoor recreational areas in Town.



New trailhead kiosks and maps at the Dry Hill Trail System.

Montague could facilitate the creation, maintenance, and promotion of trails in town by establishing a Trails Committee. The neighboring towns of Northfield, Leverett, and Sunderland each have committees working towards improving trail systems in their respective

communities. These committees have been successful at applying for grants to create new trails, developing trail maps, and organizing trail events.

By providing safe access to the Town's major rivers as well as to some of the most scenic farm and forest landscapes in the region, Montague could provide for residents' recreational needs while at the same time establishing nature- and recreation- based economic development that could benefit farmers and create new economic opportunities for Bed and Breakfast facilities, stores, restaurants, and sporting equipment outfitters catering to visitors.

B. 5. Relationship of State Open Space and Recreation Planning to Montague

The Commonwealth has completed the 2012 Statewide Comprehensive Outdoor Recreation Plan (SCORP), an update of the SCORP 2006, five-year plan. SCORP plans are developed by individual states to be eligible for federal Land and Water Conservation Fund (LWCF) grants and serve as a tool for states to use in planning for future needs and uses of outdoor resources for public recreation and relaxation. The SCORP also provides information about use of and demand for outdoor recreational resources in the state that may be relevant to Montague's open space and recreational planning efforts. The state planning process utilized statewide public meetings, a phone survey, and a youth survey to gather information on current supply and demand for outdoor recreational resources.

Demand is strongest for more trails that are close to where people live, such as town-wide trail systems that are accessible to most residents without having to drive to them. Residents in central and western Massachusetts more often mentioned hiking trails than residents in other regions as facilities they would like to see more of. Bike paths and making roads more bicycle friendly was another need identified. Increased access to water, for both swimming and boating, was often cited as a need. Forty-three percent of youth respondents stated they would like to try to canoe, kayak, and go rafting or tubing, and camp more frequently in the next five years. The needs outlined in the SCORP are consistent with recreational needs identified in the 2016 Montague Open Space and Recreation Survey and other recent town planning efforts.

C. MANAGEMENT NEEDS

Montague has a variety of management needs with respect to open space and recreation, some general and others very specific. The Turners Falls Airport completed an upgrade of various facilities and an extension to the runway. Portions of the airport site are culturally significant to Native Americans and environmentally sensitive. Any proposed reconstruction or future

expansion of the runway will need to take these environmental and archaeological factors into consideration so that the project avoids impacting these areas. Public access for non-aviation purposes is not allowed and increased site security will be developed in accordance with FAA regulations. There is a public sitting area adjacent to the terminal which provides the opportunity for birding, picnicking, and plane watching.

Redevelopment of brownfields and former industrial sites continues to be a priority for the Town. Montague's Commercial Homesteading Program has been successful at encouraging investment in the rehabilitation of vacant or abandoned historic structures in Montague's village centers. In addition, the Town should also continue its work with the Franklin Regional Council of Governments and property owners to assess the extent of contamination at potential brownfield sites and promote industrial or commercial redevelopment of these areas.

The former industrial sites on the island between the power canal and Connecticut River are of prime concern for the Town. One major impediment to redeveloping these sites is access to the island, which is primarily controlled by FirstLight Power. As part of FirstLight Power's FERC relicensing process, the Town has requested that FirstLight provide public access to the Turners Falls Historic-Industrial Canal District by repairing and maintaining the Strathmore and IP bridges and Canal Access Road. Finally, the Town has plans to redevelop the former landfill and "burn dump" area off of Turnpike Road into a new industrial park and solar installation. The Town plans to cap the old "Burn Dump" as part of the redevelopment of the site. The Town currently monitors the leachate that runs off this site.

It is important to build consensus among local officials and community leaders on a vision for the future of land use, development and conservation in Montague. This process was advanced by the 1999 Comprehensive Plan, the 2003 Open Space and Recreation Plan and subsequent OSRP updates, the 2013 Turners Falls Livability Plan, and the 2015 Montague Housing Plan, but more community discussion is needed to come to decisions about what parcels of land are critical to protect, and, just as important, how the Town should provide for housing, economic development and public services in the future. Without community consensus on what land should be protected and what land should be developed, decisions will continue to be made on a parcel-by-parcel basis, conflicts will emerge over the use of specific parcels of land, and the ability of the Town to protect its most important resources will be compromised.

In the past, land conservation efforts in Montague have largely been driven by landowners, citizen advocates, and state agencies. Specific parcels of land have been successfully targeted for protection. While the Town has supported these efforts, it has rarely taken a leadership role. To protect the land identified as important in this plan, the Town will need to be more

aggressive in identifying land conservation opportunities, working with landowners, building community support for land acquisition, leading coalitions of residents, land conservation organizations and state agencies, and raising the funds needed to complete deals. Taking this leadership role will require increased cooperation between Town boards and commissions and special districts.

Because Montague has a Representative Town Meeting form of government, it is critical to educate elected Town Meeting members about the need for and benefits of land and resource conservation. Town Meeting endorsement of this Open Space and Recreation Plan would be an important policy statement. The Open Space and Recreation Planning Committee recommend that this plan be brought to a Special Town Meeting for Town Meeting endorsement. The goals and objectives of this plan will also be advanced by endorsement from the Board of Selectmen, Conservation Commission, Agricultural Commission, Parks and Recreation Commission, and Planning Board. Letters of endorsement from these groups are included in Section 10: Public Comment.

Primary leadership for implementation of this Plan could be delegated to a new Open Space Committee. Since the last OSRP, the Agricultural Commission was re-activated to address the specific needs of agricultural operations. The Conservation Commission has the ability to purchase land for conservation and manages all Town-owned conservation land, while also weighing in on other issues such as Agricultural Preservation Restrictions. The Planning Board can facilitate land and resource conservation through revision of the Zoning Bylaws and Subdivision Regulations, both to promote conservation of land with important natural resources, and to facilitate residential, commercial and industrial development in appropriate areas. It is important that these land use policies be clearly communicated to the Board of Appeals, which enforces them. The Parks and Recreation Commission clearly has a major role to play in guiding development of recreational programs and facilities. Because decisions about taxation can determine the future use and disposition of land, the Town should work with the Board of Assessors to implement policies that promote farming, forestry and conservation of ecologically important land and resources. Finally, the Town needs to work closely with the Commissioners of the Turners Falls and Montague Center water districts to ensure protection of drinking water resources.

Increasing Town involvement in land and resource conservation will in itself require new resources and policies. Planning for conservation and the ability to educate residents about the need for land and resource protection would be greatly enhanced by a Geographic Information System (GIS). The Town currently has the latest GIS software and is working on connecting

assessor data to parcel level data. Ongoing development of GIS capability should be a priority for the Town.

Montague should work with the Conservation Commission, Planning Board, land trusts, and the State to identify the conservation value of Town-owned land, and decide how to protect lands of significant value. Land could be held by the Conservation Commission, or offered to a land trust or the State for permanent protection. If the Town decides to hold land for conservation, it needs guidelines outlining how the land will be used and maintained. Site-specific management plans should be developed for all Town-owned conservation land that address issues such as permitted uses, hours of public access, parking, signage, and a maintenance schedule.

Montague residents also need to think about future leadership for land and resource conservation. Environmental education in the schools, with an emphasis on local ecology, can help ensure that young residents of town develop an appreciation of the importance of the Town's natural resources as well as the information and skills needed to protect them.

Finally, efforts to protect Montague's natural resources should not stop at the town line. Town officials should continue to work with leaders and residents of abutting towns and the Franklin Regional Council of Governments to protect resources that span several communities. This is particularly important for aquifer protection, as part of the recharge area for the Turners Falls wells is located in the Town of Sunderland. Montague should continue to participate in regional natural resource-based planning and economic development efforts, such as the Connecticut River Scenic Farm Byway, the Franklin County Bikeway and planning efforts in the Connecticut and Millers River watersheds.

SECTION 8: GOALS AND OBJECTIVES



SECTION 8

GOALS AND OBJECTIVES

As described in Sections 2 and 6, the following open space and recreation goals and objectives were formulated through a public participation process that included a survey conducted by the Montague Planning and Conservation Department and a series of public meetings held by the Conservation Commission and a public forum.

A. Goal: Promote and protect our rivers and waterways for improved habitat and recreation opportunities

Objectives:

1. Increase public access to rivers in Montague
2. Protect riverfront areas and improve habitat and water quality

B. Goal: Provide access to high quality parks in each village

Objectives:

1. Maintain and improve existing recreation facilities
2. Ensure access to recreational programming and facilities for all residents

C. Goal: Develop a comprehensive trail network for walking and cycling that connects the villages to open space

Objectives:

1. Develop and promote a town-wide multi-use trail system
2. Maintain and improve trails within villages

D. Goal: Preserve farming as a way of life in Montague

Objectives:

1. Protect farms and working lands in Montague
2. Support the continued economic viability of agriculture in Montague

E. Goal: Preserve our pristine drinking water resources, habitat corridors, and special places

Objectives:

1. Preserve land with high water quality, habitat, and scenic and cultural resource values
2. Implement Town policies to preserve water quality, wildlife habitat, and special places

F. Goal: Green our villages

Objectives:

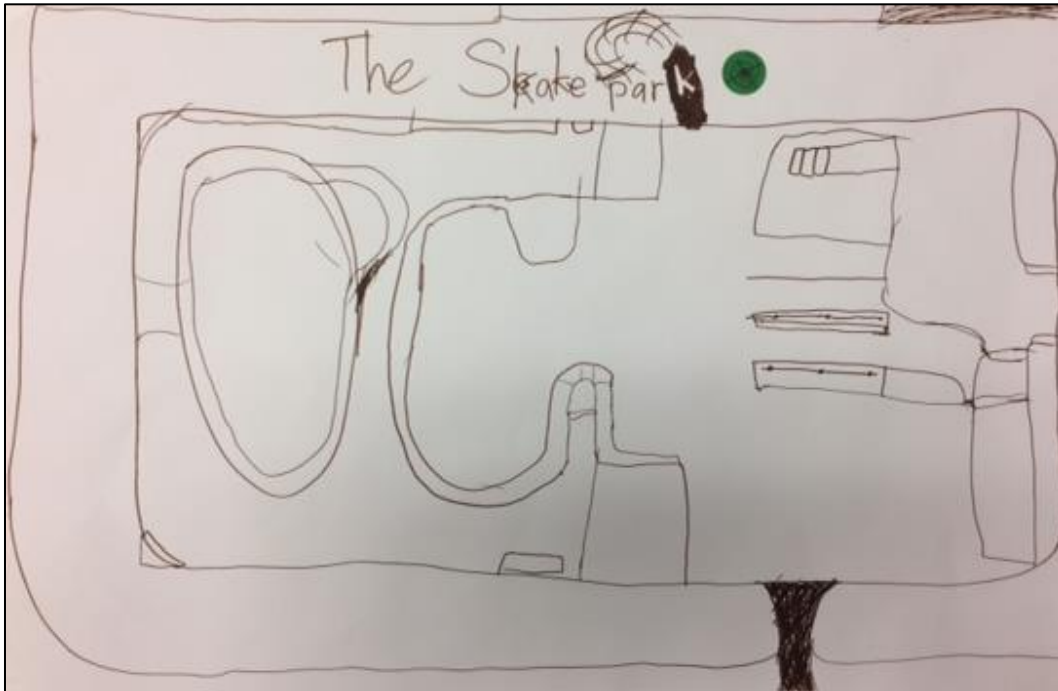
1. Promote the revitalization of villages
2. Enhance green infrastructure within public spaces
3. Support active transportation choices

G. Goal: Get organized for Open Space and Recreation

Objectives:

1. Maintain and build capacity for open space and recreation planning and implementation
2. Support funding for open space and recreation priorities
3. Conduct public education and outreach about open space and recreation priorities and projects

SECTION 9: SEVEN YEAR ACTION PLAN



SECTION

9

SEVEN YEAR ACTION PLAN

The Seven-Year Action Plan addresses the objectives of the Open Space and Recreation Plan and identifies actions to meet these objectives. At the public forum held on May 31, 2017, members of the public identified priority action items under each goal for implementation during the next seven years. These action items are represented graphically on the Seven Year Action Plan Map, and are highlighted in Table 9-1 below.

While these action items have been identified as priorities for the next seven years, all goals and corresponding objectives from this plan are listed in Table 9-1 in the same order as they appear in Section 8. They are followed in the same row by recommended actions, the board or group responsible for implementation, start dates, and potential funding sources. By implementing the recommended actions, each of the objectives will begin to be realized.

The Open Space and Recreation Planning Committee recommend the creation of two new committees to help facilitate implementation of the Plan: an Open Space Committee, and a Trails Committee. Successful implementation will also require the participation of existing Town boards, committees and staff, including but not limited to the Board of Selectmen, Planning Board, Conservation Commission, Parks & Recreation Commission, Agricultural Commission, Board of Health, Fire and Water Districts, Town Planner, Parks & Recreation Director, Health Director 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.

It is important to reflect on the Town's achievements since the last Open Space and Recreation Plan update in 2010. Below are some of the activities completed in the last seven years, which provide positive momentum for continued progress with open space and recreation goals and objectives in the future:

- 2010: Added a new Water Supply Protection District for the Hannegan Brook Public Water Supply Well
- 2010: Completed a phase I Environmental Site Assessment (ESA) on Town-owned property in support of a park in Montague City
- 2011: Reconstituted the Agriculture Commission
- 2012: Passed a Right to Farm bylaw
- 2012: Constructed a new pedestrian bridge at the North Street Wildlife Management Area
- 2013: Finalized re-construction of Unity Park with many new elements such as playground equipment, a water spray feature, rain gardens, walking path, outdoor exercise stations, volleyball court, etc.
- 2016: Built the Unity Skate Park
- 2016: Completion of bike path crossing at Montague City Road
- 2016: Posting and blazing a trail system at the Dry Hill Conservation Area
- 2016: Completed a planning study for improvements to Rutters Park in Lake Pleasant
- 2016 – 2017: Worked with the Franklin Regional Council of Governments on draft revisions to the Zoning Bylaw and Subdivision Regulations to protect natural resources
- 2010 – 2017: About 523 acres were permanently protected from development
- 2017: Initiated planning for improvements to Montague Center Park
- 2017: Installed pedestrian lighting at Peskeomskut Park
- 2017: Completion of Greenfield Road bike and pedestrian bridge.

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

OSRP Goal		Action Items	Action Type	Project Area	Responsible Party	Start	Potential Funding
A	Promote and protect our rivers and waterways for improved habitat and recreation opportunities	Objective: Increase public access to rivers in Montague					
		Develop public boating, fishing, and viewing access to the CT River below Turners Falls Dam	Physical Improvement	Turners Falls	FirstLight	2019	private investment
		Improve public access to the CT River at the Rock Dam and Poplar Street for fishing, boating, and wildlife viewing	Physical Improvement	Montague City	FirstLight	2020	private investment
		Develop public boating and fishing access to the Millers River in Millers Falls off Newton Street	Physical Improvement	Millers Falls	Town Planner, Millers Falls Improvement Assoc.	2018	DCR Rec Trails Grant, PARC
		Promote preservation and public access at Cabot Camp	Policy	Millers Falls	Town Planner, FirstLight, Land Trust	2020	private investment, Land Trust, HWCF, LAND
		Evaluate locations and develop a public swimming area	Policy	Townwide	Parks and Rec, Public Swimming Sub-Comm.	ongoing	Staff time, volunteer time, PARC
		Plan and prepare for recreational opportunities in the CT River Bypass	Policy	Turners Falls	Town Planner, Town Administrator	2017	Direct Local Technical Assistance
		Objective: Protect riverfront areas and improve habitat and water quality					
		Increase flow in the CT River Bypass to support habitat and recreation	Physical Improvement	Turners Falls	FirstLight	2019	private investment
		Improve fish passage at the Turners Falls Dam and Canal	Physical Improvement	Turners Falls	FirstLight	2019	private investment
		Protect the Millers River oxbow in Millers Falls	Policy	Millers Falls	Conservation Commission, Eversource, Land Trust	2020	private investment, Land Trust, HWCF, LAND
		Implement bio-engineering recommendations in the Sawmill River Rehabilitation Plan	Physical Improvement	Montague Center	Franklin County Conservation District	2021	MEMA Hazard Mitigation Program, DEP s.319 Program, NRCS
		Support implementation of FirstLight's Erosion Control Plan on the CT River	Policy	Millers Falls	Conservation Commission	ongoing	private investment
		Mitigate seasonal flooding on Montague City Road with bio-engineering	Physical Improvement	Montague City	DPW		MEMA Hazard Mitigation Program, DEP s.319 Program
B	Provide access to high quality parks in each village	Objective: Maintain and improve existing recreation facilities					
		Rehabilitate Rutters Park in Lake Pleasant into an ADA Accessible park	Physical Improvement	Lake Pleasant	Parks and Rec, Lake Pleasant Village Assoc.	2019	CDBG, PARC
		Rehabilitate Montague Center Park	Physical Improvement	Montague Center	Parks and Rec	2020	Town Funds, KaBoom Grant
		Rehabilitate Spinner Park	Physical Improvement	Turners Falls	Town Planner, Board of Selectmen, RiverCulture	2017	CDBG
		Rehabilitate Highland Park	Physical Improvement	Millers Falls	Parks and Rec	2021	Town Funds, CDBG, PARC
		Maintain Unity Park, Skate Park, and Peskeomskut Park	Physical Maintenance	Turners Falls	Parks and Rec, DPW	ongoing	Town Funds
		Rehabilitate the Hillcrest School and Sheffield School playgrounds	Physical Improvement	Turners Falls	GMRSD, Board of Selectmen	2019	KaBoom Grant

OSRP Goal		Action Items	Action Type	Project Area	Responsible Party	Start	Potential Funding
		Objective: Ensure access to recreational programming and facilities for all residents					
		Explore potential for a public park on municipal land in Montague City	Physical Improvement	Montague City	Parks and Rec	2022	Direct Local Technical Assistance
		Assess adequacy of existing recreational opportunities for senior citizens	Policy	Townwide	Parks and Rec/Council on Aging	2018	Direct Local Technical Assistance
		Support programming and investment at the Great Falls Discovery Center	Policy	Turners Falls	Friends of GFDC, Board of Selectmen, RiverCulture	Ongoing	volunteer time
		Develop a public park/ Native American Culture interpretive trail below the Turners Falls Dam	Physical Improvement	Turners Falls	Town Planner, Board of Selectmen, RiverCulture	2020	National Park Service ABPP, ArtPlace, Foundations
C	Develop a comprehensive trail network for walking and cycling that connects the villages to open space	Objective: Develop and promote a town-wide multi-use trail system					
		Establish a Trails Committee	Policy	Townwide	Board of Selectmen	2018	Volunteer Time
		Develop and implement a town-wide trails master plan, and publicize trails maps	Policy	Townwide	Trails Committee	2018	Staff Time
		Develop and connect the Montague Plains, Dry Hill, and Chestnut Hill Trail systems	Physical Improvement	Townwide	Trails Committee, DFW, TFWD	2019	DCR Rec Trails Grant
		Formalize the recreational trail system on the Montague Plains	Physical Improvement	Townwide	Trails Committee, DFW	2020	DCR Rec Trails Grant
		Improve trailheads off of Ripley Road, Spaulding Brook and W. Chestnut Hill Road with signage, trail maps, and parking	Physical Improvement	Montague Center	DFW, Trails Committee	2020	DCR Rec Trails Grant
		Formalize walking paths at Cabot Woods	Physical Improvement	Turners Falls	FirstLight	2021	Private Investment
		Evaluate potential for walking paths around Lake Pleasant and Green Pond and along the Millers River in Millers Falls	Physical Improvement	Lake Pleasant, Millers Falls	TFWD, Lake Pleasant Village Assoc.	2019	DCR Rec Trails Grant
		Objective: Maintain and improve trails within villages					
		Improve safety and accessibility of the hillside pathways in Turners Falls	Physical Improvement	Turners Falls	DPW	2019	DCR Rec Trails Grant
		Implement recommendations from the Turners Falls Livability Plan to improve access to the Canalside Trail Bike Path	Physical Improvement	Turners Falls	Town Planner	2020	DCR Rec Trails Grant
D	Preserve farming as a way of life in Montague	Objective: Protect farms and working lands in Montague					
		Pursue permanent protection of prime farmland soils and preservation of farms through APRs and CRs	Policy	Montague Center	Land Trusts, DAR, Town Planner	ongoing	Landscape Partnership Program, APR Match, HWCF
		Offer assistance to farmers and woodlot owners on planning for the conservation and transition of their land	Policy	Townwide	Town Planner, Land Trusts, UMass Extension	ongoing	UMass Extension, Land Trusts, Staff time
		Objective: Support the continued economic viability of agriculture in Montague					
		Ensure that the Right-to Farm Bylaw is implemented	Policy	Townwide	Agricultural Commission	ongoing	Volunteer Time
		Develop a brochure and webpage promoting Montague farms and forest product businesses	Policy	Townwide	Agricultural Commission	2018	Volunteer Time, farm and business investment
		Support existing and proposed markets for local farm and forest products	Policy	Townwide	Board of Selectmen	ongoing	Volunteer Time

OSRP Goal		Action Items	Action Type	Project Area	Responsible Party	Start	Potential Funding
E	Preserve our pristine drinking water resources, habitat corridors, and special places	Objective: Preserve land with high water quality, habitat, and scenic and cultural resource values					
		Develop a prioritized list of parcels to protect	Policy	Townwide	Conservation Commission	2018	Staff time, volunteer time
		Evaluate town-owned tax title properties and Chapter 61 parcels for their conservation and recreation value	Policy	Townwide	Town Planner	2018	Staff time
		Inventory water district parcels and identify parcels that are not permanently protected	Policy	Townwide	Town Planner, TFWD, MCWD	2019	Staff time
		Review criteria for evaluating offers of CRs and APRs	Policy	Townwide	Conservation Commission	2019	Staff time
		Provide maintenance and signage for all municipal cemeteries	Physical Maintenance	Townwide	Cemetery Commission	ongoing	Town Funds
		Objective: Implement Town policies to preserve water quality, wildlife habitat, and special places					
		Propose adoption of an Open Space Residential Design Development bylaw	Policy	Townwide	Planning Board, Town Planner	2017	EOEEA Landscape Partnership Grant
		Adopt changes to the Montague Subdivision Regulations that promote Low Impact Development (LID)	Policy	Townwide	Planning Board, Town Planner	2017	EOEEA Landscape Partnership Grant
		Research wetland protection bylaws in other towns and consider adoption of a local wetlands bylaw	Policy	Townwide	Conservation Commission	2019	Staff Time
		Evaluate current water supply protection bylaws and floodplain management regulations	Policy	Townwide	Town Planner	2019	Staff time, Direct Local Technical Assistance
		Implement best management practices for road maintenance in water supply protection areas	Policy	Townwide	DPW, MassDOT	2020	MassDOT, Mass Rural Watershed Coalition
		Evaluate local regulations to address use, storage, and disposal of hazardous materials	Policy	Townwide	Planning Board, Town Planner	2019	Staff time
F	Green our villages	Objective: Promote the revitalization of villages					
		Propose zoning amendments that encourage well planned development and redevelopment in village centers	Policy	Townwide	Planning Board, Town Planner	2017	EOEEA Landscape Partnership Grant
		Continue the Homesteading Program to promote historic preservation and redevelopment of villages	Policy	Townwide	Town Administrator, Town Planner	ongoing	Town Funds, Private Investment
		Continue Montague's representation on the Franklin Regional Brownfields Program to help cleanup properties	Policy	Townwide	Town Planner	ongoing	Environmental Protection Agency
		Support public art installations in public spaces and streetscapes	Policy	Townwide	Town Planner, RiverCulture	ongoing	MCC, ArtPlace
		Evaluate the potential for indoor recreational uses within vacant mill buildings	Policy	Turners Falls	Town Planner	2019	Town Funds, DLTA
		Objective: Enhance green infrastructure within public spaces					
		Incorporate Green Infrastructure and LID into all Town building and roadway projects	Physical Improvement	Townwide	Town Planner, DPW	ongoing	MassDOT, DEP 604b and s319 grants
		Expand Turners Falls Tree Inventory throughout Town	Policy	Townwide	Tree Committee	2019	Direct Local Technical Assistance, volunteer time
		Develop a public shade tree planting and management plan	Policy	Townwide	Tree Committee	2020	Direct Local Technical Assistance
		Balance conservation with economic development at the Sandy Lane landfill area	Policy	Turners Falls	Town Planner, Selectmen	ongoing	Staff time

OSRP Goal		Action Items	Action Type	Project Area	Responsible Party	Start	Potential Funding
		Evaluate feasibility of a Green Burial Cemetery in Montague	Policy	Townwide	Cemetery Commission, Board of Health	2019	Staff Time
		Preserve community garden space in village centers	Policy	Townwide	Town Planner	ongoing	Town funds
		Objective: Support active transportation choices					
		Evaluate Safe Routes to Schools to encourage youth walking and biking	Policy	Turners Falls	GMRSD, Town Planner	2018	Safe Routes to School Program
		Pursue MassDOT Complete Streets Program	Policy	Townwide	Town Planner, DPW	2018	MassDOT
		Develop strategy to maintain existing sidewalks, and prioritize areas for new sidewalks	Physical Maintenance	Townwide	DPW	ongoing	Chapter 90
G	Get organized for Open Space and Recreation	Objective: Maintain and build capacity for open space and recreation planning and implementation					
		Consider creation of an Open Space Committee to oversee implementation of this plan	Policy	Townwide	Town Administrator, Town Planner	2017	Staff time, volunteer time
		Evaluate staff and volunteer capacities to implement OSRP goals	Policy	Townwide	Town Administrator	2017	Staff Time
		Update Montague ADA Transition Plan	Policy	Townwide	Town Administrator	2018	Staff Time
		Maintain positive working relationship with landholding state agencies , regulatory agencies and private utilities	Policy	Townwide	Town Planner	ongoing	Staff Time
		Update Open Space and Recreation Plan	Policy	Townwide	Conservation Commission or Open Space Committee	2024	Direct Local Technical Assistance, Staff Time
		Objective: Support funding for open space and recreation priorities					
		Evaluate effectiveness and adequacy of funding for the Henry Waidlich Conservation Fund	Policy	Townwide	Conservation Commission	2018	Staff Time
		Ensure Open Space and Recreation goals are considered in townwide capital planning	Policy	Townwide	Parks and Rec, Town Planner	2018	Staff Time
		Reconsider adoption of the Community Preservation Act	Policy	Townwide	Town Administrator	2018	Staff time, volunteer time
		Objective: Conduct public education and outreach about open space and recreation priorities and projects					
		Distribute copies of Open Space and Recreation Plan to all schools and libraries in Montague	Policy	Townwide	Town Planner	2017	Town Funds
		Educate residents and visitors about existing environmental laws and conservation policies	Policy	Townwide	Town Planner	2018	Staff Time
		Publicize ongoing research and ecology of the Montague Plains	Policy	Townwide	DFG, Conservation Commission	ongoing	DFG, Staff Time
		Create a webpage on the Town Website with links to maps and resources that highlight the recreational and open space attractions in town that are open to the public	Policy	Townwide	Town Planner	2019	Staff Time

Notes: DCR = Massachusetts Department of Conservation and Recreation; FirstLight = Utility company that owns the hydroelectric facilities on the Connecticut River which are subject to a Federal Energy Regulatory Commission (FERC) license; PARC = Massachusetts Parkland Acquisitions and Renovations for Communities Program; LAND = Massachusetts Local Acquisitions for Natural Diversity Program; HWCF = Henry Waidlich Conservation Fund; MCC = Massachusetts Cultural Council; MEMA = Massachusetts Emergency Management Agency; DEP = Massachusetts Department of Environmental Protection; NRCS = Natural Resource Conservation Service; CDBG = Community Development Block Grant Program; APR = Agricultural Preservation Restriction; CR = Conservation Restriction; EOEEA = Massachusetts Executive Office of Energy and Environmental Affairs; MassDOT = Massachusetts Department of Transportation

Actions highlighted in yellow were identified as priorities by participants at the May 31, 2017 Open Space and Recreation Plan public forum, and are included on the Action Plan map at the end of this section.

Town of Montague

Open Space and Recreation Plan

Action Plan

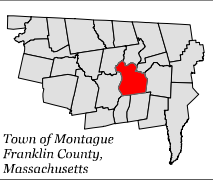
March, 2017

Legend

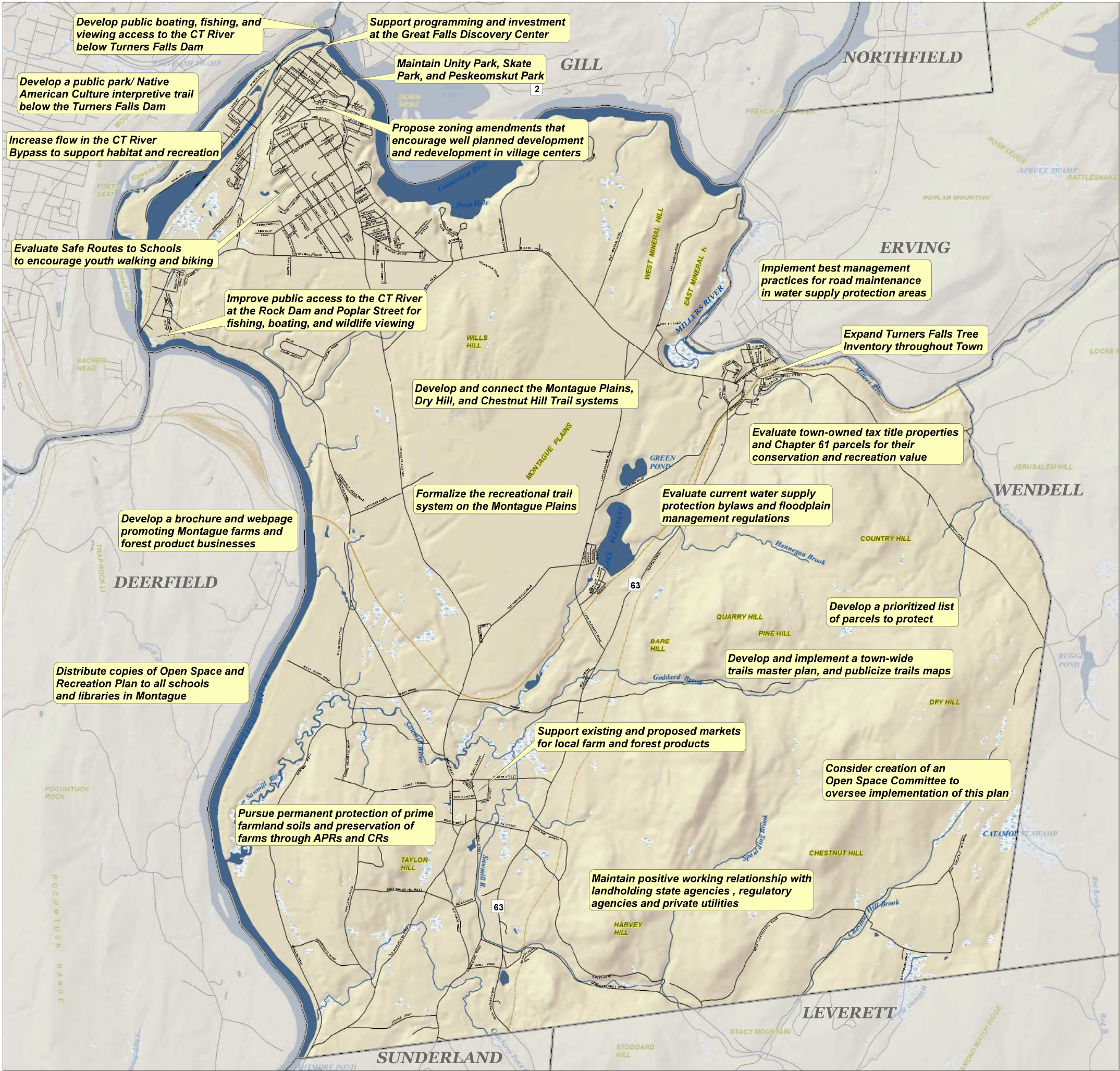
- Town Boundary
- Road
- Rail Line
- Wetlands
- Stream, River
- Pond, Lake



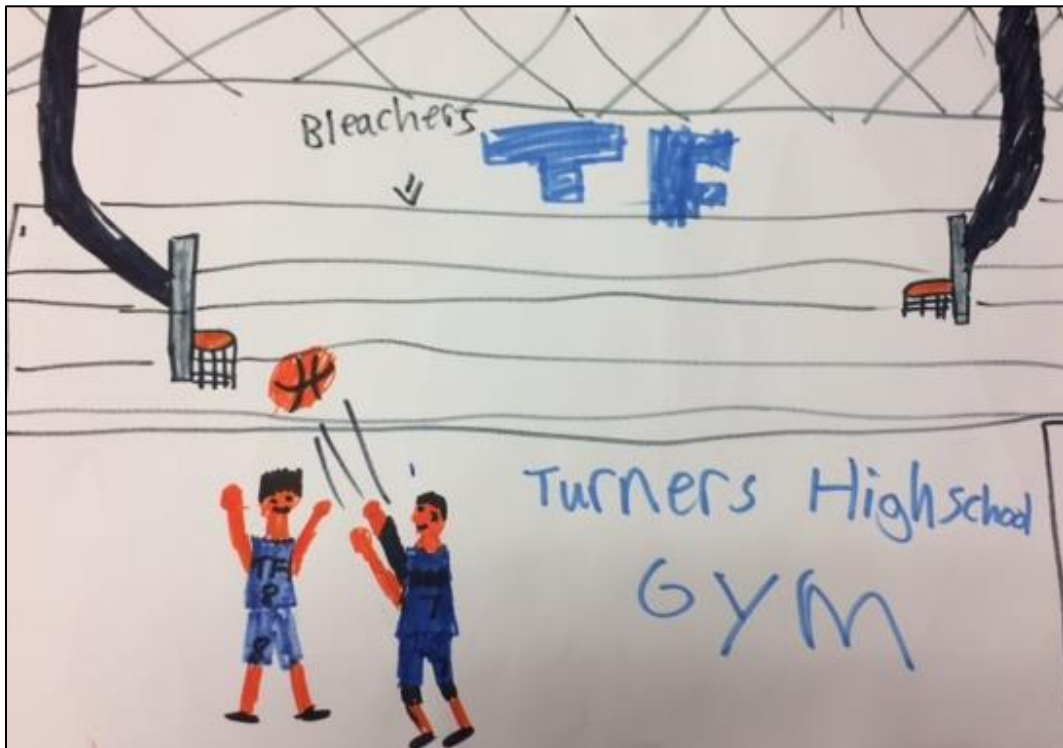
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Sources: Map produced by the Franklin Regional Council of Governments Planning Department. GIS data sources include MassDOT, MassGIS and FRCOG. Depicted boundaries are approximate and are intended for planning purposes only, not to be used for survey.



SECTION 10: PUBLIC COMMENT



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 Seven -Year Action Plan was made at the public forum held May 31, 2017, which resulted in the comments included in this section. In addition, responses to the 2016 Open Space and Recreation Survey are included in the Appendices.

Copies of the final version of the Montague Open Space and Recreation Plan were also sent to the following agencies, boards and organizations for review and comment. Their comment letters are inserted into the plan at the end of this section:

- Massachusetts Division of Conservation Services (DCS)
- Montague Board of Selectmen
- Montague Planning Board
- Montague Conservation Commission
- Montague Parks & Recreation Commission
- Montague Agricultural Commission
- Turners Falls Water District
- Montague Center Water District
- Mount Grace Land Conservation Trust
- Franklin Land Trust
- Franklin Regional Council of Governments

Over a dozen people attended the Open Space and Recreation Plan Public Forum on May 31, 2017 at the Montague Town Hall. Participants were asked to prioritize the draft action items from the plan. Attendees were asked to place stickers next to their top three action items listed under each goal that they felt should be priorities over the next seven years. Based on this exercise, three action items were identified under each goal as the top priorities. These are identified in the Seven-Year Action Plan table in Section 9, and displayed on the Action Plan Map. Additionally, forum attendees reviewed and commented on each of the maps for the plan with the exception of the Action Plan map, which was reviewed at the final Open Space and Recreation Planning Committee meeting. These comments were incorporated where possible into the final maps for the plan.

Comments and questions from forum participants are summarized as follows:

- A resident asked whether Green Pond and Lake Pleasant were really necessary as a back-up water supply. The question related to the need for an outdoor swimming area in town. The Turners Falls Water Department Superintendent answered that the new Hannegon Brook Well is hydrologically connected to Green Pond and Lake Pleasant. Because of this connection, the Massachusetts Department of Environmental Protection will not allow the lake or pond to be used for swimming.
- A question was asked whether school recreation facilities were included in the plan. The Town Planner confirmed that they are included in the resource inventory. Forum participants noted that these are important resources and questioned how the school recreation facilities could become more of a community resource. In addition, a need was expressed to upgrade the elementary school playgrounds.
- Finally, a question was asked about why farmland protection is a priority. The Town Planner answered that farmland is easily developed, making it more vulnerable to development. Montague also has prime farmland soils with the best properties for growing crops.



Board of Selectmen
Town of Montague

1 Avenue A
Turners Falls, MA 01376

(413) 863-3200 xt. 108

FAX: (413) 863-3231

June 5, 2017

Ms. Melissa Cryan, Grants Manager
Executive Office of Energy and Environmental Affairs
Division of Conservation Services
100 Cambridge Street Suite 900
Boston, MA 02114

RE: Montague 2017 Open Space and Recreation Plan

Dear Ms. Cryan,

The Montague Board of Selectmen is pleased to endorse Montague's 2017 Open Space and Recreation Plan. The plan culminates months of effort by many town residents, volunteers, and officials. This plan builds off decades of good planning and sets a clear strategy for improving our legacy of rich natural resources and a high quality of life for all people in Montague. We hope that you will find that it meets the criteria for approval by the Commonwealth of Massachusetts.

Sincerely,

MONTAGUE BOARD OF SELECTMEN:

Richard Kuklewicz, Chairman

Christopher Boutwell, Sr.

Michael Nelson

The Town of Montague is an equal opportunity provider and employer.

Page 1 of 1

Montague Planning Board

One Avenue A, Turners Falls, MA 01376 (413) 863-3200 Ext 207 Fax: (413) 863-3222 Email: planner@montague-ma.gov

June 27, 2017

Ms. Melissa Cryan, Grants Manager
Executive Office of Energy and Environmental Affairs
Division of Conservation Services
100 Cambridge Street Suite 900
Boston, MA 02114

RE: Montague 2017 Open Space and Recreation Plan

Dear Ms. Cryan,

The Montague Planning Board is pleased to endorse Montague's 2017 Open Space and Recreation Plan. The plan culminates months of effort by many town residents, volunteers, and officials. This plan builds off decades of good planning and sets a clear strategy for improving our legacy of rich natural resources and a high quality of life for all people in Montague.

Sincerely,

MONTAGUE PLANNING BOARD:



The image shows three handwritten signatures in blue ink, each written over a horizontal line. The signatures are stylized and appear to be of the same person or a group. The first signature is the most prominent and is written over a line that is slightly higher than the others. The second and third signatures are written over lines that are lower and closer together.

Montague Conservation Commission

One Avenue A, Turners Falls, MA 01376
(413) 863-3200 Ext. 207 Fax: (413) 863-3222 planner@montague-ma.gov

June 8, 2017

Melissa Cryan
Executive Office of Energy and Environmental Affairs
Division of Conservation Services
100 Cambridge Street Suite 900
Boston, MA 02114

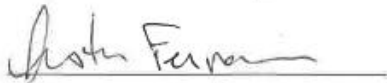
Re: Montague 2017 Open Space and Recreation Plan

Dear Ms. Cryan,

The Montague Conservation Commission is pleased to present Montague's 2017 Open Space and Recreation Plan. This plan culminates months of effort by the Conservation Commission and many residents, volunteers, and officials. This plan builds off decades of good planning and sets a clear strategy for improving our legacy of rich natural resources and a high quality of life for all people in Montague. We hope that you will find that this plan meets the criteria for approval by the Commonwealth of Massachusetts.

Sincerely,

MONTAGUE CONSERVATION COMMISSION



The Town of Montague is an Equal Opportunity Provider and Employer



MONTAGUE PARKS & RECREATION DEPARTMENT

56 First Street, Unity Park Fieldhouse
Turners Falls, MA 01376
Phone (413) 863-3216/Fax (413) 863-3229
www.montague.net

Jonathan J. Dobosz, CPRP, CPO
Director of Parks & Recreation
recdir@montague-ma.gov

Jennifer L. Peterson
Clerk/Bookkeeper
recclerk@montague-ma.gov

June 19, 2017

Ms. Melissa Cryan, Grants Manager
Executive Office of Energy and Environmental Affairs
Division of Conservation Services
100 Cambridge Street
Suite 900
Boston, MA 02114

Dear Ms. Cryan,

It is with great enthusiasm that the Montague Parks & Recreation Commission endorses the 2017 Montague Open Space & Recreation Plan. The OSRP works as the foundation for our departmental Strategic Plan, as it establishes critical benchmarks in accomplishing many of our goals and objectives.

If you have any questions, feel free to contact our department at (413) 863-3216. Otherwise, please accept this as our full support for the plan.

Dennis Grader, Chairperson
Montague Parks & Recreation Commission

The Town of Montague is an Equal Opportunity Employer & Provider



Franklin Regional Council of Governments

June 20, 2017

Ms. Melissa Cryan
Division of Conservation Services
251 Causeway Street, Suite 600
Boston, MA 02114

Dear Ms. Cryan,

The Franklin Regional Council of Governments is pleased to endorse the work of the Montague Planning and Conservation Department, Conservation Commission, and Parks and Recreation Department. We enthusiastically support their submission of the 2017 Montague Open Space and Recreation Plan (OSRP) to the Massachusetts Division of Conservation Services for final review and approval.

The plan was developed by the Montague Planning and Conservation Department with oversight from the Montague Conservation Commission and input from the Montague Parks and Recreation Department. The Franklin Regional Council of Governments Planning Department provided technical assistance to complete the update. The plan represents over ten months of work to build consensus on the most important natural, recreational, and scenic resources and needs in Town and to gather and analyze data in order to update the text, maps, and action plan from the 2010 plan. In addition, the goals, objectives, and actions in the plan reflect the vision and priorities of Montague residents gathered through the public input process for the update. We commend the Town Planner, Conservation Commission members, and Parks and Recreation Director for their dedication to this project.

The 2017 OSRP will provide Town officials and volunteers with an invaluable resource to help inform decisions regarding land use, recreation, and open space. This plan update, once approved by the State, will make Montague eligible for funding to implement land conservation and recreation projects. In addition, the Town will be better able to collaborate with neighboring towns, local land trusts, the Franklin Regional Council of Governments, and others to work towards revitalization and development that is balanced with the protection of Montague's significant natural, cultural, and recreational resources. We congratulate the Town of Montague for completing this project!

Sincerely,

Kimberly Noake MacPhee
Land Use and Natural Resources Program Manager

12 Olive Street, Suite 2, Greenfield, MA 01301-3351 • 413-774-3167 • www.frcog.org





The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181

November 1, 2017

Alyssa Larose
Franklin Regional Council of Governments
12 Olive Street, Suite 2
Greenfield, MA 01301

Re: Open Space and Recreation Plan

Dear Ms. Larose:

Thank you for submitting the draft Open Space and Recreation Plan for Montague to this office for review and compliance with the current Open Space and Recreation Plan Requirements. This plan was particularly thorough and has been conditionally approved through December 2024. Conditional approval will allow the town to participate in DCS grant rounds through December 2024, and a grant award may be offered to the town. However, no final grant payments will be made until the plan is completed.

1. Population Characteristics – the section on Environmental Justice populations is missing. Please add it.
2. Section 5 – please note that any land dedicated to park and recreation purposes in its deed is also protected under Article 97. The table that lists all town-owned conservation and recreation properties must be expanded to include a column on type of grant, if any, used to purchase or renovate the property and the recreation potential column must list specifics. A list of any Conservation Restrictions must be added, as well as any land trust properties.
3. Analysis of Needs – the Community Needs section must describe the needs of special groups, such as the elderly. Also, a discussion of the SCORP and how it relates to Montague must be added. It can be found online at <http://www.mass.gov/eea/docs/eea/dcs/scorp-2012-final.pdf>.
4. Maps – the Environmental Justice map is missing. The Unique Features map should have a larger key. The Inventory map should denote ownership.

Congratulations on working on such an important task for your community! Please contact me at (617) 626-1171 or melissa.cryan@state.ma.us if you have any questions or concerns, and I look forward to reviewing your final plan.

Sincerely,

Melissa Cryan
Grant Programs Supervisor



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
<http://www.mass.gov/eea>

December 27, 2017

Alyssa Larose
Franklin Regional Council of Governments
12 Olive Street, Suite 2
Greenfield, MA 01301

Re: Open Space and Recreation Plan

Dear Ms. Larose:

Thank you for submitting Montague's Open Space and Recreation Plan to this office for review for compliance with the current Open Space and Recreation Plan Requirements. I am pleased to write that the plan is approved. This final approval will allow Montague to participate in DCS grant rounds through December 2024.

Congratulations on a great job. Please call me at (617) 626-1171 if you have any questions or concerns about the plan.

Sincerely,

A handwritten signature in cursive script that reads "Melissa Cryan".

Melissa Cryan
Grant Programs Supervisor

SECTION 11: REFERENCES



SECTION 11

REFERENCES

American Farmland Trust. *Cost of Community Services Fact Sheet*, 2010.

<http://www.farmlandinfo.org/cost-community-services-studies>

_____. *The Economic and Fiscal Contribution of Farm and Open Land in Deerfield, Massachusetts*. September 2009.

Camp, Dresser and McKee. *Town of Montague, Massachusetts, CSO Study and Facility Plan System Characterization*, Draft Report September 2002.

Connecticut River Atlantic Salmon Commission. *Species Status Report*. Prepared by the Shad Subcommittee of the Technical Committee. June 2015.

https://www.fws.gov/r5csrc/pdf/CRASC_Shad_Status_Report_June_2015_Final.pdf

Conway School of Landscape Design. *Franklin County Farmland and Foodshed Study*. 2012.

www.frcog.org.

Colman, John A. *Source Identification and Fish Exposure for Polychlorinated Biphenyls Using Congener Analysis from Passive Water Samplers in the Millers River Basin, Massachusetts*. U.S. Department of the Interior, U.S. Geological Survey. 2001.

<https://pubs.usgs.gov/wri/wri004250/html/pdf.html>

DeGraaf, Richard M., Mariko Yamasaki, William B. Leak, and John W. Lanier. *New England Wildlife: Management of Forested Habitats*. United States Department of Agriculture Northeast Forest Experiment Station, 1992.

Dodson & Flinker and Howard/Stein-Hudson Associates. *Downtown Turners Falls Livability Plan*. 2013.

http://www.montague.net/Pages/MontagueMA_Planning/TF%20Final%20Report%2006112013.pdf

Field Geology Services. *Ammonoosuc River Fluvial Erosion Hazard Map for Littleton, NH*. 2010.

Forman, R.T.T. *Land Mosaics: The Ecology of Landscape and Regions*. New York: Cambridge University Press, 1995.

Franklin County Rural Historic Landscape Preservation Plan, 1992.

Franklin Regional Council of Governments (FRCOG). *Connecticut River Scenic Farm Corridor Management Plan*, 1998.

_____. *Sustainable Franklin County: Franklin County's Regional Plan for Sustainable Development*. 2013. www.frcog.org

_____. *Franklin County Farm and Food System Project*. 2015. <http://frcog.org/wp-content/uploads/2015/11/FRCOG-FC-Farm-and-Food-System-Project-Final-Report-093015.pdf>

_____. *Franklin County Bikeway Plan*, 2009.

_____. *Mohawk Trail East Scenic Byway Corridor Management Plan*, 2009.

_____. *Traffic Counting Program*, October 2016.

_____. *Franklin County Regional Transportation Plan*, 2016.

_____. *Turners Falls Public Tree Inventory*. Prepared for the Town of Montague Planning and Conservation Department and the Department of Public Works. November 2015.

_____. *Slum and Blight Inventory for the Millers Falls Village Center; Slum and Blight Inventory for the Turners Falls Historical-Industrial District*. December 2014.

Franklin Regional Transit Authority. *Ridership data*, 2014.

_____. *Regional Transit Plan*. 2015. <http://frta.org/about/frta-regional-transit-plan/>

Lehtinen, Michael, Dina Smith and Tom Tero. *"Preliminary Groundwater Information Survey, Town of Montague, Massachusetts."* Unpublished study, University of Massachusetts at Amherst, May 13, 1987.

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

Marshak, S. *Earth: Portrait of a Planet*. W.W. Norton and Co. New York, NY. 2004.

Massachusetts Department of Environmental Protection. *Connecticut River Watershed Assessment and Management Report*, March 1995.

_____. *Connecticut River Basin 2003 Water Quality Assessment Report*, 2008.

_____. *Millers River Watershed 2000 Water Quality Assessment Report*, 2004.

_____. *Source Water Assessment and Protection Report for Turners Falls Water District*, January 2, 2003.

_____. *Summary of Water Quality*, 1998.

_____. 2014 Integrated List of Waters Interactive Map
<http://maps.massgis.state.ma.us/images/dep/omv/il2014viewer.htm>

Massachusetts Department of Food & Agriculture, *Ag Facts Franklin County*, Available at:
<http://www.state.ma.us/dfa/facts/franklin.htm>.

MA Department of Public Health, "Results from the Body Mass Index Screening in Massachusetts Public School Districts, 2014." <http://www.mass.gov/eohhs/docs/dph/com-health/school/status-childhood-obesity-2014.pdf>

_____. Fish advisory website: https://eohhs.ehs.state.ma.us/DPH_FishAdvisory/Default.aspx. Accessed December 28, 2016.

Massachusetts Executive Office of Energy and Environmental Affairs. *Massachusetts Outdoors 2006: Statewide Comprehensive Outdoor Recreation Plan*, 2006.

_____. Division of Watershed Management, Watershed Planning Program. *Massachusetts Year 2008 Integrated List of Waters*, 2008.

Massachusetts Executive Office of Labor and Workforce Development. *Labor Force and Unemployment data*, 2005-2015.

_____. *ES202 data*, 2005-2014.

Massachusetts Geographic Information System. *Land Use Data*, 1971, 1999, 2005.

Massachusetts Natural Heritage and Endangered Species Program (NHESP), Division of Fisheries and Wildlife. *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Montague town report. 2012.

http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Montague.pdf

_____. *Massachusetts Aerial Photo Survey of Potential Vernal Pools*, Spring 2001.

_____. *Natural Heritage Atlas*, 13th edition, 2008.

_____. Website listing of rare species in Montague, available at:

<http://www.mass.gov/dfwele/dfw/nhosp/nhosp.htm>, 2009.

Massachusetts Division of Fisheries and Wildlife. "Background information on Montague Plains Wildlife Management Area," September 29, 2016.

Massachusetts Historical Commission. *Reconnaissance Survey Report* for the Town of Montague, 1982.

Massachusetts Office of Travel and Tourism (MOTT). *Massachusetts Travel Industry Report*, 2008.

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

Millers River Watershed Advisory Committee with assistance from the Franklin Regional Council of Governments and the Millers River Environmental Center. *Millers River 5-Year Watershed Action Plan 2005-2009*. September 2004.

<http://www.mass.gov/eea/docs/eea/water/wap-millers-2004.pdf>.

Millers River Watershed Coalition. *MRWC Bacteria Monitoring Program 2014 Report: Millers and Otters Rivers*. January 2015.

<https://millersriverwatershed.files.wordpress.com/2015/04/mrwc-2014-bac-t-report-final.pdf>

Montague Board of Assessors. Property records for 2016.

- Montague Building Department. Building permits records, 2000-2015.
- Montague Planning Board. *The Montague Comprehensive Plan*, 1999.
- Montague, Town of. *Montague Community Development Plan*, 2004.
- Montague, Town of. *Zoning By-laws of the Town of Montague*, 2014.
- Montague, Town of. *Montague Multi-Hazard Mitigation Plan*. 2014.
http://www.montague.net/Pages/MontagueMA_Planning/docs
- Motts, Ward S. "Montague Sanitary Landfill Project." Unpublished study, University of Massachusetts at Amherst, October 1971.
- Motzkin, G., W.A. Patterson II and D.R. Foster. "A Historical Perspective on Pitch Pine-Scrub Oak Communities in the Connecticut Valley of Massachusetts." *Ecosystems* (100) 2: 255-273, 1999.
- Motzkin, G., D. Foster, A. Allen, J. Harrod and R. Boone. "Controlling Site to Evaluate History: Vegetation Patterns of a New England Sand Plain." *Ecological Monographs* 66(3), 1996, pp. 346-365.
- Mt. Grace Land Conservation Trust. *Conservation and Land Use Planning under Massachusetts' Chapter 61 Laws*, 2007.
- Natural Resources Conservation Service. *Sawmill River Watershed Assessment*, March 2002.
- New England Interstate Water Pollution Control Commission. *The Health of the Watershed*, January 1998.
- Pressey, Edward P. *History of Montague, A Typical Puritan Town*. 1910, Second Edition, 1987.
- Robert Wood Johnson Foundation. *County Health Rankings and Roadmaps*. Accessed August 30, 2016.
<http://www.countyhealthrankings.org/app/massachusetts/2016/measure/factors/132/map>

Ryan, Robert, Mark Lindhult et al. *New England Greenway Vision Plan*, Senior Landscape Architecture Studio, University of Massachusetts, 1999. Available at www.umass.edu/greenway.

Showers, Kate. *Connecting with the Grassroots: The Millers River Watershed Council and the Massachusetts Watershed Initiative*, 8th Biennial Conference of the International Association for the Study of Common Property, Indiana University, Bloomington, Indiana, May 31-June 4, 2000.

Simons & Associates, Inc. *Erosion Control Plan for the Turners Falls Pool of the Connecticut River*, 1999.

Southern New England Forest Consortium, Inc. *Cost of Community Services in Southern New England*, 1995.

Tri-State Connecticut River Targeted Watershed Initiative. Connecticut River Water Quality Monitoring Project, 2009. <http://www.umass.edu/tei/mwwp/ctrivermonitoring.html>.

Turners Falls Observer, January 19, 1962.

Turners Falls RiverCulture website:
http://www.turnersfallsriverculture.org/about_riverculture/. 2009.

Turners Falls Water Department. *2015 Water Quality Report*.
http://turnersfallswater.com/files/Consumer_Confidence_Report_2015.pdf

United States Census Bureau. *United States Census of Population*, 1970, 1980, 1990, 2000, 2010.

_____. American Community Survey Five-Year Estimates, 2010 – 2014.

United States Department of Agriculture. *Census of Agriculture County Profile*, 2002, 2007, 2012.

_____. Natural Resources Conservation Service, *Web Soil Survey*, 2016.

United States Fish & Wildlife Service. *Final Environmental Impact Statement; Silvio Conte National Fish and Wildlife Refuge*, 1995.

United States Geological Survey, National Water Quality Assessment Program. *Water Quality in the Connecticut, Housatonic, and Thames River Basins*. USGS Circular 1155, 1998.

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

_____. *Connecticut River Five-Year Watershed Action Plan for the Massachusetts Section of the Watershed, 2002-2007*. Prepared for the Massachusetts Executive Office of Environmental Affairs. May 2003. <http://www.mass.gov/eea/docs/eea/water/wap-connecticut-2003.pdf>

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

University of Massachusetts Donahue Institute. *Vintage 2015 Population Projections*. March 2015.

_____. *Economic Impacts of Vermont Yankee Closure*. December 2014. Prepared for the Franklin Regional Council of Governments. <http://frcog.org/publication/economic-impacts-vy-closure-study/>

Vanasse Hanagen Brustlin Inc. *Sawmill River Restoration*, 2006.

Walk, Schoen and Godfrey. *Connecticut River "Swimming Hole" Project Final Report*, Massachusetts Water Watch Partnership, Amherst, MA, November 13, 1998.

Wilson, E.O. and E.O. Willis. "Applied Biogeography," Pp. 522-534 in Cody, ML and JM Diamond, editors, *Ecology and Evolution of Communities*. Belknap Press, Cambridge, Massachusetts, USA, 1975.