

# TOWN OF LEVERETT 2019 OPEN SPACE AND RECREATION PLAN



Prepared by the  
LEVERETT OPEN SPACE PLANNING COMMITTEE  
and the  
FRANKLIN REGIONAL COUNCIL OF GOVERNMENTS  
PLANNING DEPARTMENT

*Approved August 26, 2019*

*This project was funded by a District Local Technical Assistance Grant provided by the  
Massachusetts Department of Housing and Community Development,  
and by Community Preservation Act (CPA) funding from the Town of Leverett*

Cover Photo by Paul Franz, Greenfield Recorder

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# Table of Contents

<b>Section 1 – Plan Summary</b> .....	<b>1-1</b>
<b>Section 2 - Introduction</b> .....	<b>2-1</b>
A. Statement of Purpose.....	2-1
B. Planning Process and Public Participation.....	2-1
<b>Section 3 – Community Setting</b> .....	<b>3-1</b>
A. Regional Context.....	3-1
A.1 Regional Sustainability Plan Context.....	3-2
A.2 Natural Resource Context.....	3-2
B. History of the Community.....	3-6
B.1 Beginnings.....	3-6
B.2 Growth of the Town.....	3-7
B.3 Town Government.....	3-9
C. Population Characteristics.....	3-10
C.1 Demographic Information.....	3-10
C.2 Economic Wealth of Residents and Community.....	3-13
C.3 Employment Statistics.....	3-15
D. Growth and Development Patterns.....	3-19
D.1 Land Use Patterns and Trends.....	3-19
D.2 Infrastructure.....	3-22
D.3 Long-term Development Patterns.....	3-26
<b>Section 4 – Environmental Inventory and Analysis</b> .....	<b>4-1</b>
A. Documenting and Mapping Ecosystems.....	4-1
A.1 BioMap2.....	4-2
A.2 NHESP Priority Habitats .....	4-3
A.3 Resiliency to Climate Change.....	4-4
B. Topography, Geology, and Soils .....	4-9
B.1 Topography.....	4-10
B.2 Bedrock Geology.....	4-10
B.3 Soils.....	4-15
C. Landscape Character.....	4-15
D. Water Resources.....	4-16
D.1 Watersheds.....	4-17
D.2 Surface Water.....	4-17
D.3 Wetlands.....	4-19
D.4 Vernal Pools.....	4-20

D.5 Beaver Dams.....	4-21
D.6 Aquifers.....	4-21
D.4 Flood Hazard Areas.....	4-22
E. Vegetation.....	4-23
E.1 Forests.....	4-23
E.2 Public Shade Trees.....	4-27
E.3 Rare and Endangered Species.....	4-29
E.4 Aquatic Vegetation.....	4-30
F. Fisheries and Wildlife.....	4-30
F.1 Corridors for Wildlife Migration.....	4-31
F.2 Core Habitats and Rare, Threatened or Endangered Species.....	4-31
G. Scenic Resources and Unique Environments.....	4-32
H. Environmental Challenges.....	4-37
H.1 Non-Point Source Pollution and Impaired Water Bodies .....	4-37
H.2 Invasive Species.....	4-37
H.3 Flooding, Erosion and Sedimentation.....	4-38
H.4 Hazardous Waste, Brownfield Sites, Landfills .....	4-38
H.5 Forestry Issues.....	4-39
H.6 Environmental Damage From Recreational Uses.....	4-39
H.7 Environmental Equity .....	4-40
H.8 New Development.....	4-40
<b>Section 5 - Inventory of Lands of Conservation and Recreation Interest.....</b>	<b>5-1</b>
A. Introduction.....	5-1
A.1 Permanently Protected Land.....	5-3
A.2 Temporarily Protected Land.....	5-3
B. Privately Owned Parcels.....	5-4
B.1 Privately Owned Agricultural Land.....	5-5
B.2 Privately Owned Forest Land .....	5-6
B.3 Significant Private Land Holdings With Protection in Leverett .....	5-10
C. Public and Non-Profit Parcels.....	5-11
C.1 Publicly Owned Open Space.....	5-11
<b>Section 6 – Community Vision.....</b>	<b>6-1</b>
A. Description of Process.....	6-1
B. Statement of Open Space and Recreational Goals.....	6-1

<b>Section 7- Analysis of Needs.....</b>	<b>7-1</b>
A. Summary of Natural Resource Protection Needs.....	7-1
B. Summary of Community’s Needs.....	7-2
C. Management Needs.....	7-4
<b>Section 8 – Goals and Objectives.....</b>	<b>8-1</b>
<b>Section 9 – Seven – Year Action Plan.....</b>	<b>9-1</b>
<b>Section 10 – Public Comment.....</b>	<b>10-1</b>
<b>Section 11 – References.....</b>	<b>11-1</b>
<b>Appendix A – Open Space and Recreation Survey/Results.....</b>	<b>A-1</b>
<b>Appendix B – Climate Resilient Trees for Streetside Tree Belt Planting.....</b>	<b>B-1</b>
<b>Appendix C –Open Space Meeting Notices and Sign-in Sheets .....</b>	<b>C-1</b>
<b>Appendix D – ADA Self Evaluation Report .....</b>	<b>D-1</b>

# SECTION 1

## PLAN SUMMARY

The Leverett Open Space and Recreation Plan (OSRP) focuses the interest and motivation of community members towards the maintenance and promotion of existing recreational resources and the identification and protection of Leverett's natural, recreational, and historical resources. The OSRP acknowledges the balance between conservation and economic development, and how these work together to promote the long-term vitality of the town. The OSRP's purpose is to provide a framework for decisions dealing with land uses that may impact valuable natural resources and the lands that contain unique historical, recreational, scenic, and wildlife habitat values.

The 2019 Leverett Open Space and Recreation Plan (OSRP) represents the understanding of Leverett residents of the interdependence of forests, streams, swamps, wetlands, agricultural fields, scenic views, and significant historical structures and landscapes with the town's rural character. The OSRP illustrates the roles of open spaces in a township: public recreational amenities provide safe spaces to recreate, and undeveloped areas provide wildlife habitat and ensure that residents have access to forests and fields to walk, hike, and view nature.

The Seven-Year Action Plan (Section 9) gives concrete substance to the goals and objectives that were developed from the results of the 2019 Open Space and Recreation Survey and from community members' understanding of and input regarding their town's natural resource base. Within the overarching goal of strengthening resiliency to climate change, the 2019 Leverett Open Space and Recreation Plan prioritizes actions that will:

- ❖ Preserve the rural character of the town;
- ❖ Protect and preserve natural resources in preparation for a changing climate;
- ❖ Improve and maintain public education related to open space; and
- ❖ Promote wide recreational usage of Leverett's natural resources.

# SECTION 2

## INTRODUCTION

### A. STATEMENT OF PURPOSE

The purpose of this plan is to provide an accurate and thorough basis for decision-making involving the current and future open space and recreation needs of the residents of Leverett. This plan brings together and builds upon the planning efforts of the past forty-five years, beginning with the *Where We Stand: A Report of Leverett's Planning Processes* (1973) and includes several Master Plans and previous Open Space and Recreation Plans (OSRP) that have been periodically completed by the town through the years. This 2019 OSRP update primarily builds on the most recent 2010 OSRP.

While this 2019 OSRP is based on the 2010 OSRP, it has been revised and updated to reflect current thinking and consensus in town on the most important recreation and natural resource needs and the best solutions for addressing them. The detailed Seven-Year Action Plan provides a step-by-step guide that, when carried out by an Open Space Planning Committee and other town boards and commissions, will successfully implement the town's open space and recreation goals and objectives.

Since the 2010 OSRP, the Town of Leverett has worked to implement some of the Plan's recommendations, including the creation of an Open Space Committee as a subcommittee of the Conservation Commission; implementation of changes to the zoning bylaw; implementation of a nuisance vegetation management plan for Leverett Pond; acquisition of two conservation properties and one conservation restriction; the establishment of three historic districts; increased availability of trail information and maps; and expanded access to trails and trails improvements.

### B. PLANNING PROCESS AND PUBLIC PARTICIPATION

An Open Space and Recreation Survey was developed and reviewed by the Open Space Committee. A survey was made available to residents in town in the Spring of 2019 via emails to town committees. The survey was also distributed at Town Meeting and promoted via flyers around town. Residents could respond via online or by paper copy. Paper copies were placed at the Library, Town Hall, and at the Leverett Village Co-Op. The number of completed surveys was a total of 86 surveys. The results were used to inform discussions by the Open Space Planning Committee in its development of Sections: 6 – Community Goals, 7 – Analysis of Needs, and 8 – Goals and Objectives.

There have been twelve public meetings of the Leverett Open Space Planning Committee, including the Public Forum, scheduled to be held on May 28, 2019. The following boards and commissions were represented on the Open Space Planning Committee:

- Conservation Commission;
- Historical Commission;
- Recreation Committee;
- Select Board;
- Planning Board; and
- Rattlesnake Gutter Land Trust.

The Franklin Regional Council of Governments (FRCOG) provided assistance to Leverett in updating the Plan by coordinating meetings, producing maps, and writing sections of the Plan based on input received at the Open Space Committee meetings, via the survey, and at the Public Forum. The schedule of regular working meetings was posted at Town Hall and on the town's website. Before each meeting, members were sent drafts of sections of the Plan to read. The draft chapters were also posted on the town's website for public review. This form of work review was a significant and consistent vehicle for public participation in the development of the OSRP. Comments on these sections were discussed at the meetings and incorporated into the revised versions of the chapters.



**Bog Bridges to the Roaring Brook Conservation Area (Rattlesnake Gutter Trust)**

Any comments expressed at the Public Forum were recorded and included in Section 10 – Public Comments. Any ideas, comments, and corrections pertaining to different sections of the Plan and the action steps have also been included in the final version of the Leverett Open Space and Recreation Plan. As part of additional public outreach, the draft Plan was posted on the Town of Leverett's website and made available at the Library and Town Hall to obtain further feedback from the community, especially for those residents who were not able to attend the Public Forum.

The Town of Leverett does not have any Environmental Justice populations or a significant population of non-English speaking residents. As a result, the survey and outreach materials were not translated and enhanced outreach was not conducted.



# SECTION 3

## COMMUNITY SETTING

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

### A. REGIONAL CONTEXT

The Town of Leverett lies in Franklin County in west central Massachusetts, about ninety-two miles west of Boston and twenty-two miles north of Springfield. Located in the Connecticut River watershed, in the northeastern part of the Pioneer Valley, Leverett is one of the flourishing rural hill towns on the eastern side of the Connecticut River Valley. Montague and Wendell border it to the north, Shutesbury to the east, Amherst and Shutesbury to the south, and Sunderland to the west.

Leverett's rolling topography with numerous hills is mostly forested, with four major streams, scattered wetlands, a pond, and a scenic, boulder-lined ravine known as Rattlesnake Gutter. In the past, the town's hills, forests, and numerous streams have supported farming, logging and saw mills, and water-powered manufacturing. The town's proximity to Amherst College and the University of Massachusetts has attracted residents who commute to these and the other colleges in the Five-College Area. The installation of LeverettNet, a fiber-optic high speed internet network, by the Town of Leverett in 2015 is anticipated to attract new businesses and residents unable to find properties with reliable high-speed internet in other nearby communities.

Major employment centers near Leverett include Greenfield, the Franklin County Seat (about 14 road miles), Amherst, home of UMass (6 miles), Northampton (18 miles) and Springfield (37 miles). Leverett's distance from major employment centers and lack of direct access to major railroads or highways has limited growth and preserved the town's rural landscape. Many residents remained here or moved here because they value this place and community enough that they are willing to commute to jobs elsewhere or, they are self-employed. Many choose to live here, despite the commute, because of the sense of spaciousness and unhurried tenor that the town provides.

## **A.1 Regional Sustainability Plan Context**

In 2013, *Sustainable Franklin County: Franklin County's Regional Plan for Sustainable Development* (RPSD) was completed by the Sustainable Communities Consortium including Community Action, Franklin County Regional Housing and Redevelopment Authority (HRA), North Quabbin Community Coalition (NQCC), Franklin County Community Development Corporation (FCCDC), and the Towns of Greenfield, Deerfield, Montague, and Orange. The RPSD is a long-term guide for Franklin County municipal governments, regional organizations, businesses, non-profits, and individuals. Through extensive public participation, individual residents and representatives of many organizations contributed to the creation of the plan. The plan identifies issues and constraints, goals, and recommendations and strategies in seven subject areas: housing, transportation, economic development, energy, natural resources, cultural resources, and land use and infrastructure. The overall sustainable development goals that came out of the public participation process are as follows:

- ❖ Increase and improve the housing stock, while focusing on affordability;
- ❖ Provide additional options for alternative transportation;
- ❖ Encourage economic development, by redeveloping vacant sites;
- ❖ Promote energy conservation and efficiency;
- ❖ Protect natural resources, including farmland and drinking supplies;
- ❖ Foster the growth of arts and culture;
- ❖ Concentrate new growth near town centers and focus on infill development; and
- ❖ Improve infrastructure, particularly high speed internet.

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

## **A.2 Natural Resources Context**

Leverett's topography is made up of moderate to rugged uplands arising from the eastern side of the Connecticut River Valley, with the highest elevation of 1,260 feet at Brushy Mountain, located in the east-central part of town. The northern part of Leverett drains into the Sawmill River, which flows northwest into the Connecticut River, and central and southern Leverett drain into Long Plain Brook, Doolittle Brook, and Roaring Brook. The town's only large fresh water body is Leverett Pond, located in the south-central part of town, which probably served as a prime spot for native fishing and hunting. It was also an important water source that influenced colonial settlement patterns and supported the first village in town, Leverett Center. Since the

late eighteenth century the pond has been enlarged to provide water for industry downstream, and today supports a residential development along the shoreline.

Leverett, like the greater Franklin County region, has abundant forest resources. Approximately 85 percent of Leverett is forested.<sup>1</sup> Between 1999 and 2005, Leverett experienced an increase in land identified as forested, representing an addition of approximately 81 acres.

In 2014, Harvard Forest published *Changes to the Land: Four Scenarios for the Future of the Massachusetts Landscape*,<sup>2</sup> an evaluation of the consequences of four different trajectories for how land use could change in the state over the next 50 years, with a specific focus on the impacts to the region's forests. The scenarios reflect different amounts and intensities of land development, timber harvesting, farmland expansion, and forest conservation.

Key findings from the study show that the "Forest as Infrastructure" scenario ranked first in terms of benefits to people and nature. Under this scenario, accelerated land conservation targeted to areas of priority habitat would protect more than half a million acres of priority habitat by 2060. Widespread adoption of "improvement forestry" would maintain critical forest benefits while increasing local wood production. The majority of new development would be clustered and concentrated near existing cities and towns to minimize forest loss and reduce the impact of growth on water resources and forest habitat.

Finally, the study found that the loss of forests to development has more immediate and pronounced impacts on carbon storage and water quality than gradual forest changes associated with climate change. The report emphasizes how local land-use decisions can greatly influence the ability of the state's forests to offset greenhouse gas emissions and moderate the effects of climate change. The overarching policy implications from the study are that there is much to gain by conserving forests and managing them well by:

- ❖ Recommitting to land conservation,
- ❖ Redoubling land-use policy and smart-growth efforts<sup>3</sup> through local and state zoning reform that supports transit-friendly, walkable communities where new growth uses land efficiently and limits impacts on natural resources, and
- ❖ Promoting sustainable forestry in the Commonwealth.

Farmland and prime agricultural soils are another natural resource of regional significance that is impacted by development. Currently, approximately 3% of the land in Leverett is actively being farmed. The Town of Leverett currently has no properties with Agricultural Protection Restrictions (APRs) in place.<sup>4</sup> The town has limited prime farmland soils and little agricultural activity, so there may be few properties in town that would meet the criteria of the Massachusetts Department of Agricultural Resources (MDAR) for APR protection, which include the size of

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<sup>1</sup> 2005 MassGIS Land Use data.

<sup>2</sup> <http://harvardforest.fas.harvard.edu/changes-to-the-land>.

<sup>3</sup> To learn more about Smart Growth, see the Massachusetts Executive Office of Energy and Environmental Affairs' Smart Growth/Smart Energy Toolkit at [http://www.mass.gov/envir/smart\\_growth\\_toolkit/](http://www.mass.gov/envir/smart_growth_toolkit/).

<sup>4</sup> Private communication with Ron Hall, APR Program Coordinator, Conservation & Technical Assistance, Massachusetts Department of Agricultural Resources; November 9, 2017.

the property, current agricultural activity, and suitable soils. Protecting farmland and keeping it affordable is a key strategy to help ensure the region’s sustainability. Currently, only 25% of the region’s farmland is permanently protected.<sup>5</sup>

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. Franklin County’s poverty rate is estimated to be slightly above the Massachusetts average. An estimated 7.7% of Leverett’s residents live below the poverty line, and the estimated 2015 median household income in town of \$83,333 was significantly higher than the county and state medians. However, that does not mean that there are not pockets of poverty that create challenges for some Leverett residents. Poverty is determined by annual income based on the size of a household and the number of children within the household. For example, the poverty threshold for a one-person household in 2012 was \$11,720. The poverty threshold for a four person household with two children was \$23,283.

In 2008, Governor Patrick released a Call to Action, which documents the extent of the obesity epidemic in Massachusetts, its consequences, and efforts to tackle it. To help address this significant public health problem, the Massachusetts Department of Public Health launched the Mass in Motion (MiM) program in January 2009. The program includes technical assistance and grants to cities and towns to help them build policies, systems and environments that promote wellness and healthy living. Mass in Motion emphasizes the link between how a community is designed, including access to parks, healthy food, and transportation options, and public health. The program focuses on helping cities and towns design healthier communities by:

- ❖ Conducting Health Impact Assessments (HIAs) to understand how community projects, plans, or policies can affect us and our health
- ❖ Following “Complete Streets” policies that make roads safe and enjoyable for all users by installing safe bike lanes, bike racks, easy-to-follow signage, and safe crosswalks
- ❖ Preserving open space and developing recreational space and community centers where people can gather and socialize
- ❖ Improving and cleaning up existing green space and parks

These MiM services are available to the Town of Leverett and participation by town officials on the project’s Steering Committee is welcome.

Work of the Leverett Trails Committee in recent years has had positive health impacts as described in the FRCOG report “From Plan to Project: Franklin County, MA—Report on Health Elements in Franklin County Plans, and Case Study Write-ups of Successful Projects that Promote an Increase in Physical Activity within Communities.”<sup>6</sup> These activities have included

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<sup>5</sup> *Sustainable Franklin County: Franklin County’s Regional Plan for Sustainable Development*. Franklin Regional Council of Governments, 2013. [www.frcog.org](http://www.frcog.org).

<sup>6</sup> Franklin Regional Council of Governments, *From Plan to Project: Franklin County, MA—Report on Health Elements in Franklin County Plans, and Case Study Write-ups of Successful Projects that Promote an Increase in Physical Activity within Communities*; September 2013. This project was funded in part by the Massachusetts

development and maintenance of an extensive trail system and plans in progress for an accessible, multiple use trail at the Leverett Elementary School. The town also has multiple gathering places including the Post Office, Library, Town Hall, the Leverett Village Co-op, and the transfer station. Activities supported in these venues include a Friday lunch at Town Hall for seniors, exercise classes, and special events.

In 2013 the Massachusetts Department of Transportation (MassDOT) issued the Healthy Transportation Policy Directive, ensuring that all Mass DOT projects are designed and implemented in a way that provides for safe and healthy transportation options for the public, including walking, biking, and transit. The policy is a result of the Healthy Transportation Compact, a requirement of the 2009 transportation reform legislation. The compact is an inter-agency initiative between state transportation, public health, energy and environment, and housing and economic development agencies, designed to facilitate transportation decisions that balance the needs of all transportation users, expand mobility, improve public health, support a cleaner environment and create stronger communities.

In 2015, Mass DOT launched the Complete Streets program, which encourages communities to adopt a complete streets policy. Adopting a policy commits towns to work to integrate the needs of all users of the public right of way into street and roadway projects. An objective of the Complete Streets program is to “facilitate better pedestrian, bicycle, and transit travel for users of all ages and abilities by addressing critical gaps in pedestrian, bicycle, and transit infrastructure, and safety.” Through the program, communities with a state-approved policy and a prioritized list of projects are eligible for construction funding up to \$400,000 for FY 2016 and 2017. One challenge for the Town of Leverett is the lack of sidewalks to facilitate pedestrian safety.

In planning for the protection of open space and natural resources and the provision of recreational opportunities in the Town of Leverett, residents will continue their efforts to take advantage of the positive role natural resources play in their community and across the region. Leverett’s landscape encompasses rolling hills and rock outcrops; mature forests of mixed hardwoods, hemlocks and pines; streams and scattered wetlands; and occasional pastures and fields. Its thirty-five miles of country roads—both paved and dirt—are generally lined with sheltering trees and bordered with stone walls that remain along the edges of farm fields and pastures. Agricultural land remaining in Leverett is located mainly along the Sawmill River and Long Plain, Roaring and Doolittle Brooks. As is the case throughout the region, most of the existing farms are part-time operations that grow hay for horses or raise horses, beef cattle, or sheep and goats, while owners also work off the farm to increase their income and to receive benefits. Leverett Pond and Rattlesnake Gutter are two special features of the landscape. Each of these characteristic landscapes is discussed in detail in Chapter 4, Environmental Inventory and Analysis. The presence and relatedness of these significant resources present both opportunities and challenges to open space and recreation planning for Leverett. In addition, these landscapes have shaped the historical development of Leverett and the surrounding region.

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Department of Public Health Mass in Motion Program, and the Massachusetts Department of Transportation in cooperation with the U.S. Department of Transportation.

## **B. HISTORY OF THE COMMUNITY**

### **B.1 Beginnings**

Few Native American archaeological sites have been reported in Leverett. The small number is the result of limited archaeological study and little amateur and avocational collection activity in the town. What is known of Native American occupation to-date is derived from artifact collections owned by Leverett residents who found the artifacts during farming or development of their properties, as well as the Leverett Historical Society. Artifacts in these collections are time markers that suggest that Leverett has been occupied for at least the past 8,000 years. There is no evidence to-date for historic period Native American sites but they surely exist. In addition, modern Native Americans know of sacred and ceremonial sites, whose locations have been handed down through oral history. These sites are not necessarily reflected in artifact collections, or discovered through archaeological research.

While most of the known Native American site locations in Leverett have been disturbed through farming, orchards, and residential development, some have been spared. Consideration about future conservation should include permanent protective measures for these ancient sites.

Most records agree that the first permanent settlement by European colonists was in 1750 in the section now called Leverett Center. Leverett became a town in 1774, when area residents successfully petitioned the state for separation from Sunderland. The town was named in honor of John Leverett, an early governor of Massachusetts, who strongly opposed religious persecution and British rule. Today, seven faith communities are active in town: Congregationalist (United Church of Christ, Leverett Center); Baptist (North Leverett Baptist); Evangelical (Moore's Corner Church); Quaker (Mount Toby Friends Meeting, Long Plain); Sikh (Guru Ram Das Ashram), and two Buddhist communities (Cambodian: Wat Kiryvongsa Bopharam; Japanese: Nipponzan-Myohoji Order) <sup>7</sup>.

Colonial settlement was limited, with most occurring in the mid-18th century, much of it the result of the expansion of Sunderland into parts of Long Plain and Leverett Center. The town's first meeting house was completed in Leverett Center in 1776. Late colonial settlement occurred in North Leverett, the site of a small community of Baptists, as a result of expansion from Montague. Agriculture was a primary occupation of colonial residents focused around the Leverett Pond area and elsewhere through town, although good soil for agriculture was limited. Metal-smithing, milling and other industries prevailed in North Leverett and Moore's Corner Villages.



**Leverett Pond (Lori Lynn Hoffer)**

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<sup>7</sup> <http://www.onlyinyourstate.com/massachusetts/tiny-town-diverse-churches-ma/>

The first census in 1790 listed 524 persons. By the mid-1800s nearly one thousand people lived in town. The town's first century was an active industrial period. Factories, mills, lead mines, surface stone quarries and shops supplemented self-sufficient farms in producing goods and services. Abundant waterpower prompted the development of at least twenty-two mills along the Sawmill River and its tributaries. Other mills were located on Roaring Brook. Mills and factories in Leverett included grist mills, fulling mills, sawmills, blacksmiths, machine shops, scythe factories, box shops, a tannery and stills. The remains of dams and foundations of these early enterprises remain today. Early industry included the production of hoes, scythes, tables, chairs, churns, yarn, brooms, palm leaf hats, shoes and satinets. The 19th century saw the development of charcoal production in kilns.



**N. Leverett Sawmill (Lori Lynn Hoffer)**

In 1900 a box factory operated in the center of town, one of several operating in town at that time. The building remains in use today as the gallery and studios of Leverett Crafts and Arts. Each of the four community centers (East Leverett, Leverett Center, North Leverett, and Moore's Corner) had a general store. Watson General Store at Moore's Corner was once the largest in the county. Many homes continued to serve as inns for travelers, as they did in colonial times. On Hemenway Road, a charcoal industry once thrived. In its heyday, it produced charcoal for gas mask filters, gunpowder, and insulation during World War II. There are remnants of these kilns on Brushy Mountain and in town along the Sawmill River. The sawmill in North Leverett, built by Joseph Slarrow in the 1760's continued to produce such long (44') timbers that they were used to build ships (minesweepers for the Coast Guard) in the Brooklyn Navy Yard through World War II.

Life changed in Leverett with the arrival of the railroad in 1866, of electricity and the automobile at the turn of the 20<sup>th</sup> century. World War I followed, and jobs in cities, military service, and ease of transportation made self-sufficiency unnecessary and impractical. The large, historic homes increasingly housed an aging population.

## **B.2 Growth of the Town**

At the end of World War II, an influx of returning veterans, drawn to the area by the expanding University of Massachusetts in adjacent Amherst, increased the population and brought about dramatic changes for Leverett. Many large colonial houses were available and affordable. Smaller traditional homes were built mostly in the southern part of town. A second influx soon followed, settling in the northern part of town.

Craftspeople, artists, neo-homesteaders, and counter-culture groups found Leverett's easily accessible rural areas appealing in the mid-1960s. The dramatic expansion of Mass Agricultural College in Amherst to the University of Massachusetts during this period brought with it a much larger student body and number of employees, both faculty and staff, seeking housing nearby. In

the 1980s another distinct group—affluent professionals—arrived. Using new energy-efficient building techniques, they built homes as large as the older houses but designed them for modern, smaller families. Often secluded, these new homes did not change the impression of a sparsely settled traditional New England countryside.

Two events helped to integrate new members into Leverett culture. The giant step in 1950 of replacing nine one-room schools scattered around town with a consolidated elementary school merged long-time residents from different parts of town and different occupations. Another significant unifier was the expansion of the telephone exchange that simplified communication within all parts of the town. Prior to the expansion, it is reported that a child living in North Leverett wanting to call an elementary school friend in the middle of town couldn't do it because "it was long distance, too expensive."

Leverett today is a town that values its historic landscapes, sites, independence and tradition of mutual aid. It looks to the future, building community to bring high speed internet to every residence, sustain its local elementary school, and protect its environment, while encouraging sustainable economic development. In the early 2000s there was considerable development of public facilities along Montague Road, including expansion of the elementary school (2001); construction of a public safety complex combining fire, police, and highway departments (2002); and building a new library (2003). Many Leverett residents are self-employed in the building and construction trades or in other home-based businesses. The arrival of high speed internet in 2015 brought contemporary communications infrastructure and allowed residents to participate in the new information-based digital economy.

Today, Leverett has a large percentage of self-employed workers (writers, small business owners, craftspeople, scholars, lawyers, medical professionals and non-profit/human service workers) compared with other Franklin County towns, but most of Leverett's residents commute out of town for work. The neighboring town of Amherst serves as an employment center, along with Greenfield, Northampton, Holyoke and Springfield, with many residents employed by the University of Massachusetts, Amherst and other area schools. There is a limited employment base within town: the largest employer located within Leverett is the town itself, with both municipal and school employees. In addition, Leverett has a few other visible businesses and organizations that have employees or volunteers, including the Village Coop store, the Leverett Crafts and Arts Center, the Post Office, Grass Roots forest and landscape management business, The Whole Tree Arborists and Dakin Animal Shelter.

Appreciation of the area and a sense of stewardship have been consistent threads throughout Leverett's history. It came into sharp focus during the Bicentennial Celebration of the town in 1974. Four National Register Historic Districts have been designated in the last decade and the Historical Commission is currently engaging citizens in identifying strategic priorities for a preservation master planning process with the Select Board and the Conservation Commission.

The first century developed a diversity of skills among its homogenous population. The second and third centuries have encompassed an increasing diversity of life-styles, backgrounds and interests, providing a richness of human resources and requiring respect for difference. Both



“newcomers” and “old-timers” have become relative terms. Balancing our many resources to sustain a future that is responsible to present and past is a challenge that Leverett welcomes!

### **B.3 Town Government**

At each regular town meeting in mid-spring, officers are elected, a budget is passed, and special warrants are considered. Special town meetings are called when needed. The town government is headed by a three-person Select Board supported by several other boards (Health, Planning, Finance, School, and Library) to which members are elected.

The Select Board makes appointments to the Capital Planning Committee, Conservation Commission, Council on Aging, Cultural Council, Emergency Planning Board, Historical Commission, Recreation Commission, and the Zoning Board of Appeals. The high level of volunteerism on boards and committees in town government reflects citizen commitment to, and pride in, the town.

## **C. POPULATION CHARACTERISTICS**

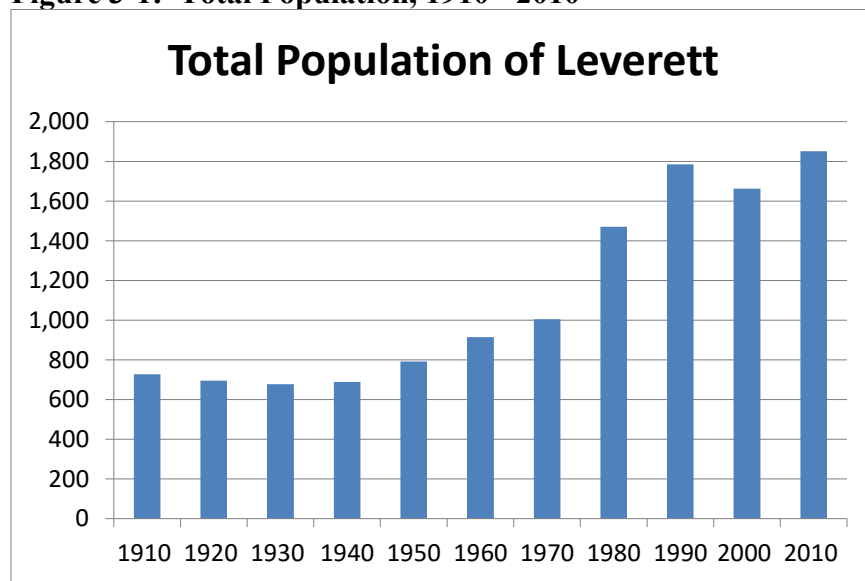
In order to identify the open space and recreation needs of the community, it is essential to know about the people who call Leverett their home. Therefore the size, age, density, income, and occupations of the population are discussed so that informed decisions may be made regarding the type, quantity, location and level of future investments in open space and recreation areas and facilities.

### **C.1 Demographic Information**

Although Leverett was established in 1774, there is little available information on early demographics. That year, there were 63 “landowners” listed in the property inventory. The first census in 1790 listed 524 persons, and by the mid-1800s, nearly one thousand people lived in town. More recent censuses indicate that 791 people lived in the town in 1950. The population increased to 1,785 in 1990 and reached 2,006 in 2002. In 2009, the population declined to 1,830.

According to the 2010 U.S. Census, Leverett has 1,851 residents. The current population density estimated for 2015 is 80 people per square mile. As indicated below in Table 3-1 and Figures 3-1 and 3-2, the population in Leverett decreased by 6.8% between 1990 and 2000. Between 2000 and 2010, however, Leverett’s population increased by 11.3%, and is estimated to have increased by another 3% by 2015. This increase contrasts with broader trends in Franklin County over this period, where the population is estimated to have decreased by 1.1%. However, the population of Massachusetts as a whole is estimated to have grown by 3.8% since the 2010 Census. As noted above, the availability of the high speed fiber optic internet in Leverett is anticipated to have an impact on both the town’s population size (increasing it) and the age distribution (increasing the numbers of younger adults and their children).

**Figure 3-1: Total Population, 1910 - 2010**



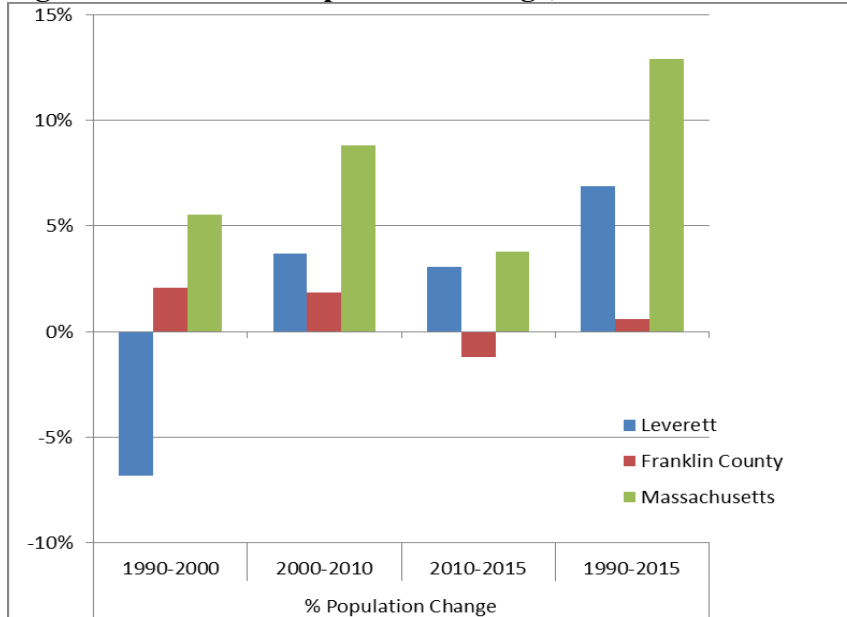
Source: U.S. Census Bureau.

**Table 3-1: Total Population, 1990 - 2015**

Geography	U.S. Census Population			
	1990	2000	2010	2015 Est.
Leverett	1,785	1,663	1,851	1,993
Franklin County	70,092	71,535	71,372	71,144
Massachusetts	6,016,425	6,349,097	6,547,629	6,705,586

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates..

**Figure 3-2: Percent Population Change, 1990 - 2015**



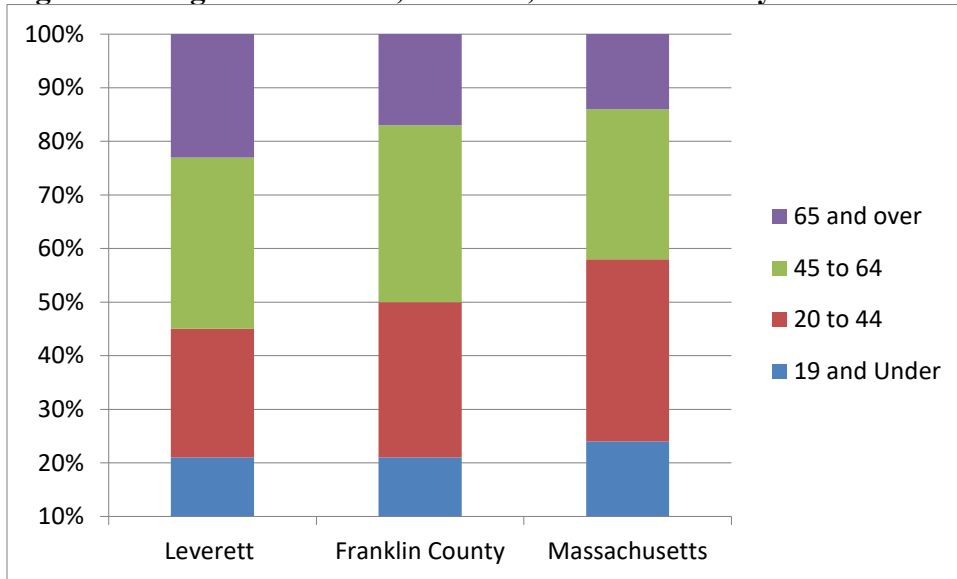
Source: U.S. Census Bureau.

To determine how the recent and projected population increase in Leverett translates into demand for open space and recreational resources, it is necessary to look at the age distribution of the current and projected population. According to the U.S. Census, shown in Figure 3-3 below, the Town of Leverett has a higher percentage of citizens in the 65 and over age category (24%) than Franklin County (17%) and Massachusetts as a whole (15%). The town has a comparable percentages of children 19 and under, young adults from 20-44 years of age, and adults between 45 and 64 years of age when compared with Franklin County and Massachusetts as a whole.

If the relatively large cohort of elderly residents (65 and over) were to continue to reside in Leverett, it could result in a significant population of individuals in the oldest age cohorts in ten to twenty years. As shown in Figure 3-4, population projections estimate that by 2020, roughly 31% of Leverett’s population will be between the ages of 65 and 84, compared to 24% estimated in 2015. By 2035, this elderly population is estimated to have increased to 32% of the population. Of even greater significance, the percentage of the oldest residents (85 and over) is projected to increase from just 1% in 2010 to 7% in 2035. It will be interesting to see if the introduction of high speed internet in town will have an effect on these projected age distribution trends. Evaluating the Town of Leverett’s current recreation opportunities and how they meet

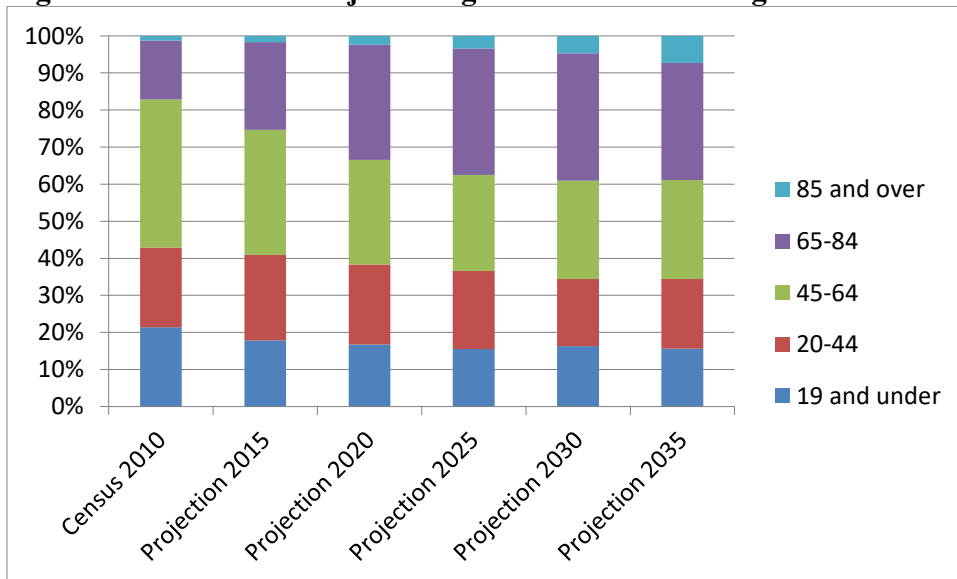
the needs of an aging population, particularly in terms of facilities that are accessible to those with disabilities, is key to developing recreational programming in the coming years that will be attractive to older residents. However, even with an aging population, providing facilities and programs appropriate for all ages will remain an important recreational goal for the town in the future.

**Figure 3-3: Age Distribution, Leverett, Franklin County and Massachusetts**



Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates.

**Figure 3-4: Leverett Projected Age Distribution through 2035**



Source: UMass Donahue Institute Vintage 2015 Population Projections. March 2015.

In identifying the best location for the development of new open space and recreation resources, the locations where concentrations of population may occur and which parts of the local citizenry

require specific needs are important considerations. As will be seen below in Section D, Growth and Development Patterns, future growth depends in large part on zoning, slopes, soil and groundwater related constraints, and on which lands are protected from development. Identifying key parcels that might be future parks and walking trails close to the current distinct neighborhoods, and/or areas that could be later developed for residential uses, will be the ongoing responsibility of town officials, concerned citizens, and key organizations (such as local land trusts and recreational organizations). Identifying opportunities to conserve land in Leverett that protects valuable scenic and natural resources and provides public access to trail networks and open spaces will be another ongoing responsibility of these stakeholders.

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

### C.2 Economic Wealth of Residents and Community

Measures of the income levels of Leverett’s residents as compared to the county and state are helpful in assessing the ability of the citizenry to pay for recreational resources and programs, and for access to open space.

**Table 3-2: Income and Poverty**

<b>Geography</b>	<b>Per Capita Income Estimate</b>	<b>Median Household Income Estimate</b>	<b>Percent of Individuals Below Poverty Level*</b>
Leverett	\$43,647	\$83,333	7.7%
Franklin County	\$30,584	\$55,221	11.7%
Massachusetts	\$36,895	\$68,563	11.6%

\* For whom poverty status was determined.

**Source:** American Community Survey 2011-2015 Five Year Estimates. Five-year estimate of income for the past 12 months and reported in 2015 dollars.

Table 3-2 describes the earning power of residents in Leverett as compared to the county and the state. The 2015 ACS 5-year estimated Leverett per capita income was \$43,647, which was higher than both the county and state figures. The median household income for Leverett was estimated to be \$83,333 in 2015, which was also significantly higher than the county and state estimates. Leverett’s poverty rate of 7.7% is lower than for both Franklin County and Massachusetts as a whole. Of the population with income below the poverty level (153 persons), 16% (25 persons) are 65 years of age and up. An additional 12% (18) are between the ages of 55 and 64, and 33% of those residents living in poverty are children under the age of 17 (50 children).

Table 3-3 shows the relationship between the age of the householder (or head of the household) and the median income in Leverett, Franklin County, and the state in 2014, the most recent year for which estimates are available. Median income for households with a householder under 25 years are fairly consistent between Leverett, the county, and the state. For middle-aged householders between 25 and 44 years of age, Leverett’s median income (\$67,917) is higher than the county’s, but lower than the state’s. However, the median income for households with an

older householder 65 years and over, is strikingly higher in Leverett at \$76,528 than in either the county (\$36,879) or the state (\$39,550).

**Table 3-3: Income and Age**

Age Categories	Massachusetts	Franklin County	Leverett
Total median household income, all ages	\$67,846	\$54,072	\$78,125
For households, with a householder under 25 years	\$30,397	\$32,348	\$32,813
For households, with a householder 25-44 years	\$76,699	\$56,730	\$67,917
For households, with a householder 45-64 years	\$84,099	\$65,400	\$88,750
For households, with a householder 65 years and over	\$39,550	\$36,879	\$76,528

**Source:** American Community Survey 2010-2014 Five-Year Estimate. Data shows median household income in the past 12 months by age of householder. Most recent data available for the Town of Leverett was for 2014.

One reason for the relative economic wealth of Leverett residents may be the high levels of educational attainment among the population. Table 3-4 shows the levels of educational attainment for Leverett residents over the age of 15, compared to the county, state, and federal levels. Of particular note is the extremely high percentage of 38% of Leverett residents over the age of 25 years who have attained a graduate or professional degree. This compares with 16% in Franklin County, 18% in Massachusetts, and just 11% in the United States as a whole.

**Table 3-4: Educational Attainment**

Educational Attainment Levels	Leverett		Franklin County		Massachusetts		United States	
		%		%		%		%
Population over 25 yrs of age	1,502	100%	52,268	100%	4,610,510	100%	211,462,522	100%
High School Graduate and Equivalency	207	14%	14,164	27%	1,169,375	25%	58,722,528	28%
Some College, no degree	194	13%	10,044	19%	745,794	16%	44,529,161	21%
Associates Degree	87	6%	5,549	11%	357,133	8%	17,029,467	8%
Bachelor's Degree	368	25%	9,817	19%	1,049,150	23%	39,166,047	19%
Graduate or Professional Degree	570	38%	8,595	16%	817,953	18%	23,786,225	11%

**Source:** American Community Survey 2011-2015 Five Year Estimates.

Eighty-six percent of occupied housing units in Leverett were owner-occupied. This percentage is significantly larger than the 69% owner-occupied rate for Franklin County and 62% for the state as a whole. The average household size for these units was 2.38 persons. For renter-occupied units the average household size was 2.56. The median value of owner-occupied units was \$343,900. Of particular note is that 54% (461 out of 856) of the homes in Leverett were built since 1970.

Another way to describe a community's income and economy is the poverty rate. In Leverett, 7.7% of residents for whom poverty status was determined were estimated to be living below the poverty level. Leverett's poverty rate was significantly less than in the county and state.

**Environmental Justice (EJ)** 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. The Environmental Justice Executive Order No. 552 requires EEA agencies to take action in promoting environmental justice. The Executive Order requires new environmental justice strategies that promote positive impacts in environmental justice communities and focus on several environmental justice initiatives. EJ communities are defined as being low income, having a high minority population, and/or to have a high rate of English language isolation, based on the 2010 U.S. Census data. According to MassGIS, there are no Environmental Justice populations identified in the Town of Leverett. That notwithstanding, there are concerns about water supply contamination, which resulted from leaching from the old town dump, that affects residents in certain areas. Further, concern about the effects of the high cost of land and homes in Leverett has led the town to establish programs to provide grants to first-time home buyers and down payment assistance, administered through the Franklin County Regional Housing & Redevelopment Authority (HRA) and using the town's Community Preservation Act funds.

Although Leverett's resources today consist of both its people and its natural and built landscapes, the status of its finances could be affected by an interdependent relationship that exists between the two. The costs of the community services provided to residents are paid for with the tax revenues generated by different kinds of property, both developed and undeveloped. Some developed uses, such as housing, often require more services including education and road maintenance. The costs associated with one household are rarely paid for by the revenues generated by that same property. One reason that towns encourage economic development is to have another type of property in town, other than residential, to share the tax burden. Protected open space, on the other hand, can cost towns very little in community services, provide a modest amount of tax revenues, and reduce the amount of housing that can ultimately occur in town. This relationship is explored in more detail below in subsection D, Growth and Development Patterns.

### **C.3 Employment Statistics**

Employment statistics like labor force, unemployment rates, numbers of employees, and place of employment are used to describe the local economy. Labor force figures can reflect the ability of a community to provide workers that could be employed by incoming or existing businesses. Unemployment rates can show how well residents are faring in the larger economy while employment figures describe the number of employees in different types of businesses. Employment can be used as a measure of productivity. The number of people employed in each business can be used to determine the types of industries that should be encouraged in town. The town may decide to encourage business development to provide services to residents, create more jobs, and as a way of increasing taxable property values, which can help pay for municipal services and facilities, including recreational parks and programming as well as protected open space.

### C.3.1 Labor Force: Leverett residents that are able to work

The labor force is defined as the pool of individuals who are 16 years of age and over, and are either employed or who are actively seeking employment. Persons not actively seeking employment, such as some enrolled students, retirees, or stay-at-home parents, are excluded from the labor force. In 2016, the Town of Leverett had a labor force of 1,076 with 1,046 residents employed and 30 unemployed (*see Table 3-3 below*). Leverett experienced a 2.8% rate of unemployment, lower than both Franklin County’s overall rate of 3.3% and the Commonwealth of Massachusetts’ rate of 3.7%. For the period 2007 through 2016, Leverett generally had a lower rate of unemployment than the county and state (*See Figure 3-5 on the following page*). The town experienced the same fluctuations in unemployment as the county and state over the course of the last ten years, but was not as severely impacted as other areas in terms of unemployment rates (*see Table 3-5 below*). However, it is also evident that Leverett’s labor force figures and the number of employed in town are influenced by the greater economy, as demonstrated by the highs and lows in Figure 3-5.

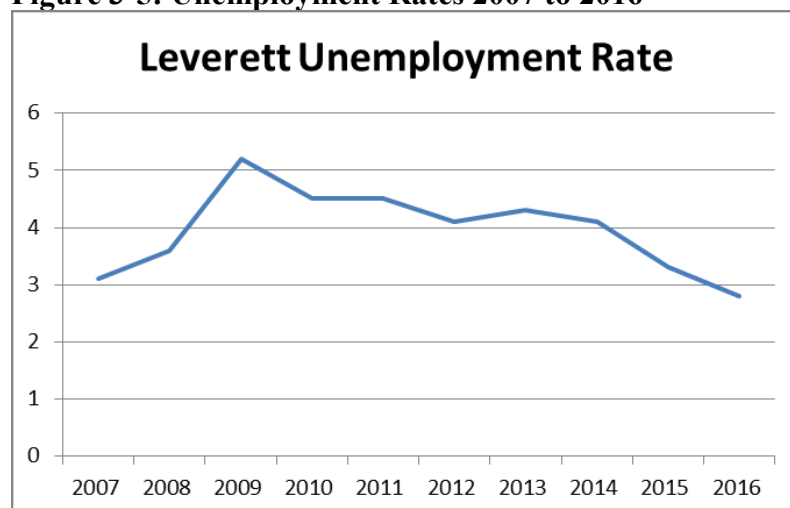
**Table 3-5: Labor Force and Unemployment Data, 2016**

Geography	Labor Force	Employed Persons	Unemployed Persons	Unemployment Rate
Leverett	1,076	1,046	30	2.8%
Franklin County	39,307	37,995	1,312	3.3%
Massachusetts	3,588,600	3,455,833	132,755	3.7%

Source: Massachusetts Executive Office of Labor and Workforce Development, LAUS Data.

As Figure 3-5 demonstrates, Leverett’s unemployment rate has fluctuated between 2.8% and 5.2% from 2007 through 2016, with the highest rates occurring in 2009 and 2011, during the economic downturn, and the lowest rates occurring at the end of the period. As shown in Figure 3-6, during this same time frame, Leverett’s labor force remained largely constant at just under 1,100 persons, and the number of employed persons fluctuated between 970 and 1,050, with the lowest number of employed persons occurring in 2009 at 968.

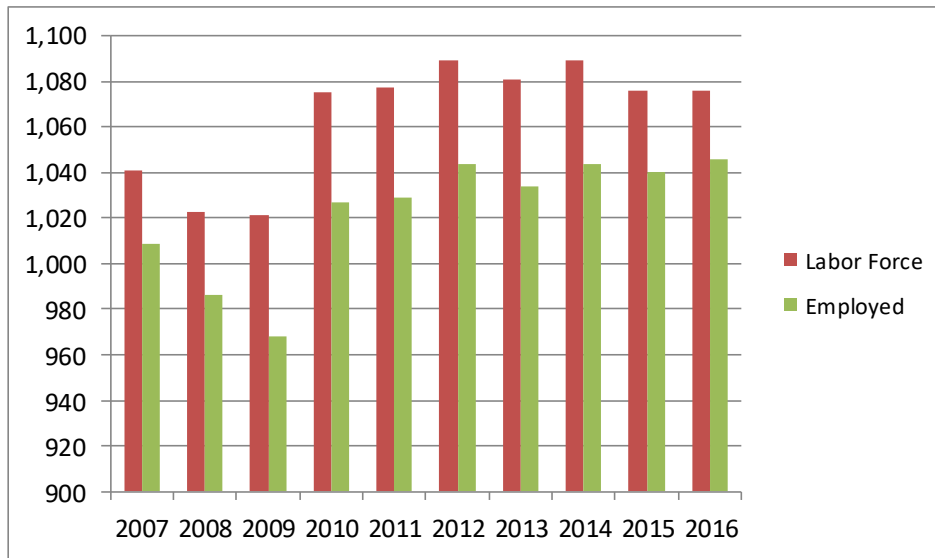
**Figure 3-5: Unemployment Rates 2007 to 2016**



Source: Massachusetts Department of Labor and Workforce Development.



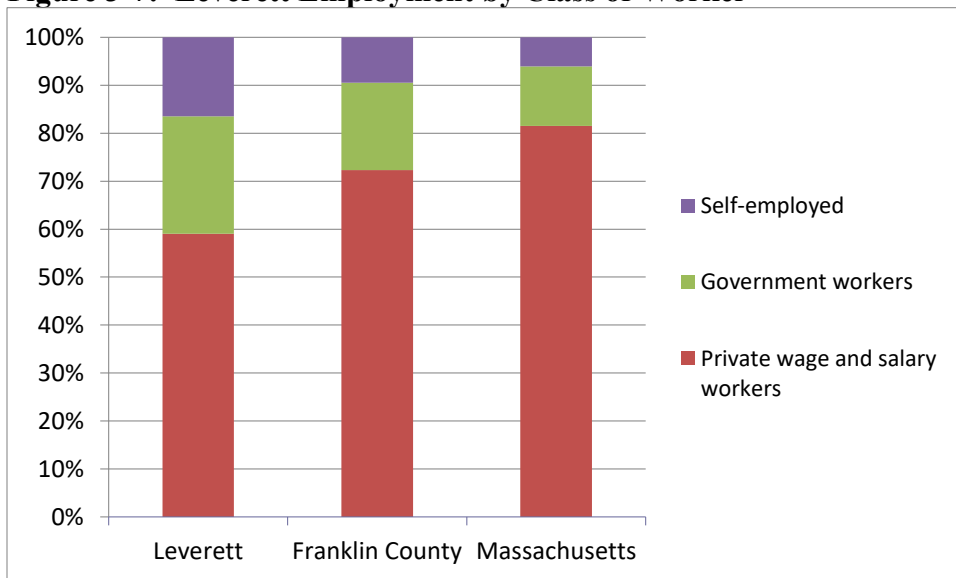
**Figure 3-6: Labor Force and Employed Persons in Leverett, 2007 through 2016**



Source: Massachusetts Department of Labor and Workforce Development.

Figure 3-7 shows the class of worker for the civilian employed population aged 16 years and over, and demonstrates that the Town of Leverett has more self-employed workers at 16.5% of the working population, compared to Franklin County at 9.5% and Massachusetts as a whole at 6.1%. The list of business certificates issued by the Town of Leverett includes 29 home-based businesses, though this does not represent a comprehensive listing of businesses in town.

**Figure 3-7: Leverett Employment by Class of Worker**



Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates.

According to the U.S. Census Bureau, the classes of workers shown in Figure 3-7 are defined as follows:

- “Self-employed” includes people who worked for profit or fees in their own unincorporated business, profession, or trade, or who operated a farm.
- “Government workers” includes people who were employees of any local, state, or Federal governmental unit, regardless of the activity of the particular agency. The government categories include all government workers, though government workers may work in different industries. For example, people who work in a public elementary school or city-owned bus line are coded as local government class of workers.
- “Private wage and salary workers” includes people who worked for wages, salary, commission, tips, pay-in-kind, or piece rates for a private, for-profit employer or a private not-for-profit, tax-exempt or charitable organization. Self-employed people whose business was incorporated are included with private wage and salary workers because they are paid employees of their own companies.

**C.3.2 Employment in Leverett: People who work in town, whether residents or not**

In 2015 the total average monthly employment in Leverett was 1,061 people, according to the Massachusetts Department of Labor and Workforce Development data.<sup>8</sup> The largest sectors for employment in Leverett are the Health Care and Social Assistance sector and the Construction sector. The percentage of people employed in the Health Care and Social Assistance sector is 14% of the average monthly employment, and the Construction sector establishments employ 9%. The Professional and Technical Services sector employs 5% of those working in town.

About 12.5% of employed persons 16 years and older (133 of the total 1,061 workers) were estimated to work at home in Leverett in 2015. Half of Leverett residents commuted between 15 and 29 minutes to work in 2015.<sup>9</sup> The mean travel time to work for employed Leverett residents was 26 minutes, reflecting the large number of residents that commute to the Amherst-area labor market (in particular to the University of Massachusetts, the region’s largest employer). Table 3-6 shows the numbers of Leverett residents employed at UMass-Amherst as of November 2017. The total of 160 workers employed at UMass-Amherst in the various job classifications represents 15% of the town’s total number of employed residents.

**Table 3-6: Leverett Residents Employed at UMass-Amherst, 2017**

<b>Classification</b>	<b>Employee Count</b>
Faculty	53
Staff	68
Student	20
Temp	19
<b>Grand Total</b>	<b>160</b>

**Source:** University of Massachusetts—Amherst, Human Resources Department, private communication, 11/8/17.

According to 2016 data compiled by the Massachusetts Executive Office of Labor and Workforce Development and InfoGroup, the largest employers located within the Town of Leverett are the Leverett Elementary School and the Town of Leverett.

<sup>8</sup> Massachusetts Department of Labor and Workforce Development, Employment and Wages Report (ES-202).

<sup>9</sup> American Community Survey 2011-2015 Five Year Estimates.

## **D. GROWTH AND DEVELOPMENT PATTERNS**

This section of the plan provides basic data on the patterns and trends in land use and development in Leverett driven by the characteristics of the landscape and the culture that has shaped it over the years. The first subsection reviews patterns and trends in land use. The next subsection describes the existing infrastructure in Leverett and the effects it has had on development patterns. Finally, the section concludes with an analysis of long-term development patterns, including a discussion of current land use controls, currently anticipated residential and commercial developments, and their impacts on the natural and built environment.

### **D.1 Land Use Patterns and Trends**

Leverett's residences are spread across the landscape, but cluster around the four community centers of East Leverett, Leverett Center, North Leverett, and Moore's Corner. Leverett is primarily a community of single-family residences: more than 88% are single-family homes.<sup>10</sup> Most homes have been constructed along Leverett's roads as Approval Not Required (ANR) lots under Massachusetts' Subdivision Control Law (M.G.L. Chapter 41, Sections 81K-81GG). The town has only a few subdivisions.

Growth and development in Leverett are constrained by the town's rocky, hilly terrain and by the necessity for meeting the strict standards of a legal building site as required by the Board of Health, the Conservation Commission, and related state regulations (Title V). The most recent county soil survey found that most soils in town have severe limitations for development with current waste disposal technology.

More than two hundred years ago, Leverett's settlers depended directly on the land for their day-to-day survival. The land was a source of food and shelter and provided freedoms and opportunities for enterprising and creative residents. Today, much former pastureland is now forest as abandoned farms quickly revert to forest. What may have once been wet meadows are now red maple swamps. Other new wetlands are the result of changes to the drainage patterns of town roads and the re-introduction of beavers that has resulted in flooding in some areas. Depending on one's perspective, reclaimed forest land is the result of either neglect or good fortune. Either way, Leverett is losing scenic vistas, early successional wildlife habitat, and landscape diversity.

In Table 3-7 a comparison of the types of land uses and their acreages in Leverett between 1971 and 1999 demonstrates which natural resources are most susceptible to development pressures. Cropland and forestland have been the primary resources converted to other uses, particularly to residential development. As residential development on large lots of a ½ acre or larger increased, both cropland and forestland acreages decreased.

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<sup>10</sup> American Community Survey 2011-2015 Five Year Estimates.

**Table 3-7: Land Use Change in Leverett, 1971 - 1999**

Land Use	1971 Acres	1999 Acres	1971-1999 Change
Forest	12,749	12,493	-256
Water and Wetlands	215	248	33
Agriculture (cropland and pasture)	698	567	-131
Small Lot Residential (< .5 acre)	20	19	-1
Large Lot Residential (> .5 acre)	617	929	312
Commercial	0	5	5
Industrial	0	4	4
Recreation	5	17	12
Urban Open Land	25	33	8
Open Land	404	403	-1
Other (transportation, waste disposal, mining)	11	12	1

Source: 1971 and 1999 MassGIS Land Use data.

Urban Open Land on the above table consists of areas in the process of being developed from one land use to another (if the future land use is at all uncertain). Open Land, in contrast, consists of vacant land, idle agriculture, rock outcrops, and barren areas. Vacant land is not maintained for any evident purpose and it does not support large plant growth.

The land use tradeoffs between 1971 and 1999 were primarily a loss of forest and farmland and a gain in low-density residential development. During this time, cropland and pasture decreased by 131 acres, while forested land decreased by 256 acres. Residential lots greater than ½ acre increased by 312 acres.

Due to changes and improvements in the methods for data collection and analysis, the MassGIS land use datasets for the earlier years of 1971 and 1999 are not directly comparable to the 2005 data. Table 3-8 below provides a summary of land uses in Leverett in 2005. In 2005, approximately 85 percent of the total area in town was forested, 3 percent was in agricultural use, and just over 4 percent was in residential use, the majority on lots greater than a ½ acre. Less than 1 percent was in high density residential, commercial, industrial, mining, water, recreation use, urban public/institutional, powerline/utility, or other uses.

**Table 3-8: Summary of Leverett Land Use, 2005**

Land Use Category	Acres	Percentage of Total Acreage in Town
Forest <sup>11</sup>	12,574	85%
Residential (> .5 acre lots)	613	4%
Wetlands	573	4%
Agriculture	464	3%
Powerline/Utility	165	1%
Water	102	0.7%
Open Land	91	0.6%
Other	87	0.6%
Recreation	25	0.2%
Urban Public/Institutional	18	0.1%
Commercial	11	0.1%
Residential (< .5 acre lots and multi-family)	6	0.04%
Mining (e.g., gravel pits, etc.)	6	0.04%
Industrial	3	0.02%
Total	14,738	100%

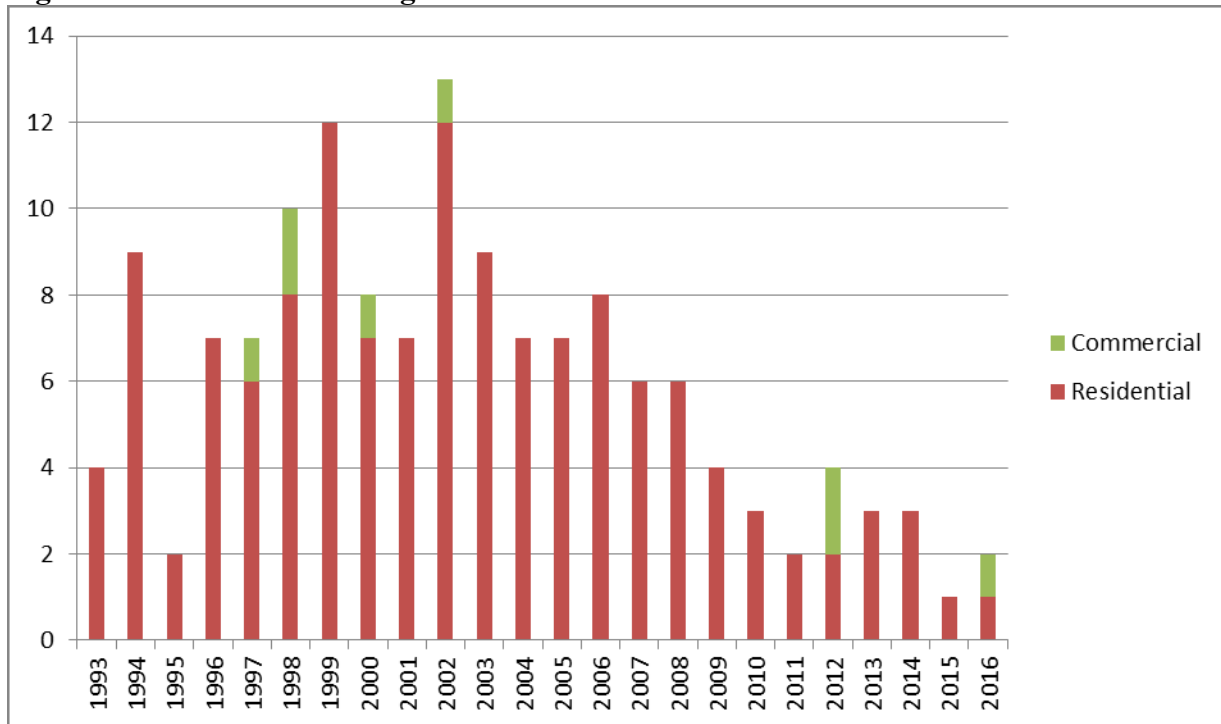
**Source:** 2005 Massachusetts GIS Land Use data.

The loss in natural resources may go beyond simply the loss in acreage. As farm and forest land acres are converted to residential and commercial uses the landscape becomes fragmented. Fragmentation of the landscape can negatively impact the quality of wildlife habitat, watershed protection, recreation opportunities, farm viability, forest management opportunities, and ultimately the municipal services budget. Many rural towns in western Massachusetts have much of their landscape covered in forest vegetation. Unlike more urbanized towns, this forestland is not intersected by roads or residential development. As development spreads across the landscape, wildlife habitat may become segmented so that animals requiring large amounts of interior forest habitat are forced to search for it in still more remote areas. Fragmenting large blocks of contiguous forestland also jeopardizes the water quality and quantity in many first and second order streams, which are the most extensive and sensitive components of a watershed's stream network. When a large forest block is fragmented by a subdivision, the resulting parcels associated with single family homes are often too small to manage individually for forestry purposes. Finally, the most inefficient method of providing municipal services such as police, fire, sewer, water, waste disposal, and plowing is associated with a fragmented landscape where residential development is spread sparsely across the town. The value of recreational opportunities associated with hiking, snowmobiling, and mountain biking often depends on whether there exists a network of fields and forests that are somewhat removed from residential areas. The indirect value of open farmland and un-fragmented forests is an important concern in making decisions about future open space and recreational property protection and acquisition.

<sup>11</sup> The “forest” land use category may include residential properties that are located in wooded areas and not visible in the aerial survey.

From 1981 to 1985, fifty-two single-family homes were built in Leverett; twenty-six in 1985 alone. Between 1993 and 1997, an average of six houses was built each year, with a low of two and a high of nine. In the years from 1998 to 2008, an average of eight houses was built each year, with a low of six and a high of thirteen. Between 2009 and 2016 (including the Great Recession) an average of three houses was built each year, ranging from a low of one to a high of four per year. From 2012-2017, there have been very few house lots sold in Leverett and there are no subdivisions being planned.

**Figure 3-8: Leverett Building Permits 1993-2016**



Source: Franklin County Cooperative Inspection Program

The 2015 implementation of the LeverettNet fiber-optic high speed internet network followed a multi-year, intensive planning process and was broadly supported by the town’s voters. The availability of high-speed internet is key to maintaining these existing businesses and attracting new businesses to the community. Equally important, it is anticipated that the availability of high-speed internet will attract more families with young children to Leverett, which may help to address the falling school enrollment rates experienced in recent years.

## D.2 Infrastructure

Leverett’s geography has been a major factor in the development of its infrastructure. Rounded hill tops surrounded by large wetland systems have helped to shape and guide local land use patterns as well as limit the value that existing and potential infrastructure might offer towards the expansion of development beyond those lots with frontage on the main roadways in town.

## D.2.1 Transportation Systems

### Roads

The major artery running through town is Route 63, which connects Leverett with Amherst to the south and with towns to the north including Montague, Erving, Northfield and finally to communities in New Hampshire such as Keene. Leverett residents can travel both east and west via Route 2. Rte. 202 runs between Springfield and points north, and can be accessed by traveling east on Shutesbury Road. The closest access to I-91, Franklin County's major north/south route, is in South Deerfield. Route 116 is not in town, but is used as route north and south and to I-91.

The town has a total of forty-three miles of road, of which approximately sixteen miles are gravel.

### Transit

While the Franklin Regional Transit Authority (FRTA) and the Pioneer Valley Transit Authority (PVTA) provide active service to towns to the west and south, there are no regular transit services available to the Town of Leverett. The PVTA provides demand-response transportation services for the elderly and disabled residents. With the passage of Chapter 432 of the Acts of 2016, Leverett will now also be able to join FRTA, which would allow senior citizens to participate in the FRTA Med-Ride.

Due to Leverett's small population, and current necessity for residents to own vehicles, it is uncertain whether a transit system would consider a route through the town to be profitable.

### Rail

A rail line runs through Leverett and a siding track (rail spur) serves primarily as an access point for maintenance workers.

### Air

The closest airport to Leverett in Franklin County is the Turners Falls Municipal Airport, a general aviation facility located in Montague. Other municipal airports are located in the region in the towns of Northampton and Orange. Commercial flights can be obtained at Bradley International Airport, an approximately forty-five minute ride south via I-91 to Windsor Locks, Connecticut.

### Pedestrian and Bicycle

Since 1991 and the passage of the federal Intermodal Surface Transportation Efficiency Act (ISTEA), bicycling and walking have been recognized as viable and efficient modes of transportation. Consequently, bicycle and pedestrian facilities are included as a regular part of transportation planning activities on the federal, state, regional, and local levels. Not only are bicycling and walking integral components of the transportation system in Leverett and Franklin County, but they are also crucial components that help make the region a livable place. In Leverett, both biking and walking take place on the roads themselves, as there are no sidewalks, bike lanes, or even wide shoulders to accommodate these users. The U.S. Department of Transportation and the Federal Highway Administration have recently focused their attention on

the important role these modes of transportation play and the many benefits they provide a community, including: reduction of greenhouse gases and other air pollution, lowered energy costs, less use of land and pavement, increased health benefits for people, economic savings, increased social interactions, and community revitalization.

Recently the FRCOG partnered with the YMCA in Greenfield, Baystate Franklin Medical Center, Greenfield Community College, and the Franklin County Chamber of Commerce to develop and launch *Walk Franklin County – for the Health of It!* This cooperative program works to promote walking for transportation, reduction of air pollution, and physical fitness and health. The *Walk Franklin County – for the Health of It!* project is a free program that allows participants to measure and record their walking progress and receive rewards for reaching their walking goals. The FRCOG has completed sets of walking maps for each town in Franklin County, including one in Leverett: a 3-mile out and back route on a quiet dirt/gravel road with wonderful scenery through Rattlesnake Gutter. A map of the walk is available online at <http://www.walkfranklincounty.org/maps.php>.

The Franklin County Bikeway is a project under implementation by the FRCOG with the aim to provide a biking network, with both on-road and off-road facilities, throughout Franklin County, linking employment, recreational, and educational destinations. Routes that travel on the roads within Leverett include:

- Leverett-Amherst Route - Intermediate (13.4 Miles). This route travels from Millers Falls Road through Montague Center to Leverett Center and connects to North Amherst in Hampshire County. From North Amherst this route connects to the University of Massachusetts campus, the University Connector Bike Path, and the Norwottuck Rail Trail.
- Shutesbury Loop - Intermediate (20.5 Miles). This loop travels through Shutesbury from the existing Leverett-Amherst Route. This route travels north to Lake Wyola via Locks Pond Road and then heads west on Lakeview Road/North Leverett Road to connect with the bikeway on Montague Road.

Franklin County Bikeway maps are available on-line on the FRCOG website at: <http://frcog.org/program-services/transportation-planning/>

### D.2.2 Water Supply

The Town of Leverett does not have a municipal water or sewer system but it does have a public water supply system that serves the Library, the Public Safety Complex (Emergency Operations Center, Police Department, Fire Department, and the Highway Department), and the Elementary School. The water supply for all of Leverett's homes is provided by private wells or springs. Some of the older wells are shallow but continue to function satisfactorily. In some areas of town, deep wells (depths exceeding five hundred feet) are required for an adequate source of water. Up-to-date and effective regulations for new construction are necessary to assure that every household has an uncontaminated water supply in the future.



### D.2.3 Sewage Disposal

Each household in town has its own private septic sewer system. There are no plans for a community sewage disposal system. While such a system might be technically feasible, the cost of construction and maintenance would be prohibitive. To address the site requirements of private systems, the Board of Health has joined with five nearby towns to employ a shared health agent to expedite the review of septic systems. Since the passage of Title V of the Massachusetts Sanitary Code, town residents have upgraded their septic systems as needed.

### D.2.4 Solid Waste Management

The town landfill was closed and capped in 1992 and a transfer and recycling station was established on adjacent land. The station includes dual stream recycling (paper/cardboard vs. plastic, metal, and glass containers), a trash compactor, and a Salvation Army container for clothing. There are also several sheds that contain "take-it-or-leave-it" articles, including children's items, electronics, clothes, and books. The station also accepts electronics, pellet bags, mercury, CFLs, batteries, propane, tires, and freon items to be recycled or disposed of properly. Two large containers are on-site for metal recycling and for bulky items and building materials. Use of the transfer station requires an annual permit (\$30), plus payments for household waste placed in the trash compactor. Additional payment is required to dispose of items in the construction dumpster, as well as for the disposal of freon, propane, tires and electronics. Approximately 400 households utilize the town landfill.

The Rattlesnake Gutter Trust has a shed at the site to collect refundable beverage containers, later redeemed to fund the acquisition of open space. Since its inception in 1992 through June 2017, over \$76,262 has been collected for that purpose.

Leverett is a member of the Franklin County Solid Waste Management District. Therefore, all residents of Leverett can dispose of household hazardous wastes in the fall through their program.

In calendar 2016, Leverett shipped 142 tons of trash and 141 tons of recycling to the Springfield Materials Recycling Facility. This accounts for fifty percent of the total waste collected at the station; the remainder is diverted to scrap metal collections and Good Will. The high percentage of waste diverted to recyclables has earned Leverett national recognition.

### D.2.5 High Speed Internet

LeverettNet is a Fiber-optic-To-The-Home (FTTH) high speed internet network owned by the Town of Leverett, Massachusetts. LeverettNet is operated under the telecom authority of the Leverett Municipal Light Plant (LMLP), which contracts with third parties for Network Operator, Internet Services Provider (ISP), and maintenance functions.

LeverettNet provides symmetrical (equal upload and download) 1-Gigabit-per-second (1Gbps) Active Ethernet (dedicated fiber links) connectivity between each subscriber location and the Internet Point of Presence. LeverettNet connects from the Point of Presence to the Internet

Service Provider (ISP) at 2-Gigabits-per-second (2Gbps), via the Massachusetts Broadband Institute “middle mile” network, a project of the Massachusetts Technology Collaborative.

Subscribers pay a monthly ISP fee, plus a LMLP charge for Network Operator and maintenance costs. Current monthly ISP charges are: Stand-alone Internet, \$23.40; Stand-alone, full-featured telephone, \$23.40; Combined package, \$38.40. The current LMLP monthly charge is \$50.49, which is added to the ISP cost.

### D.3 Long-Term Development Patterns

#### D.3.1 Land Use Controls

The Leverett zoning by-laws were completely revised in 1991 and have undergone many subsequent amendments over the years. They contain many provisions designed to promote and maintain open space. The town is divided into five main districts: Residential/Village (RV), Residential/Rural (RR), Rural/Outlying Residential (RO), General Business (GB), and Commercial (COM). There are seven additional overlay districts: Aquifer Protection, Flood Hazard, Stream and Lake Protection, Scenic Roads Protection, Rattlesnake Gutter, Upper Elevation Site Plan Review, and the Wireless Telecommunications Overlay Districts. The Aquifer Protection District was established to prevent contamination of ground and surface water resources that provide existing or potential water supplies. This overlay district substantially increases lot frontage and acreage requirements. The other overlay districts seek to protect town resources and amenities.

Lot frontage and area range from 150 feet and 40,000 square feet to 400 feet and 200,000 square feet. Two-family structures require a fifty percent addition to the frontage and acreage requirements in the RV, RR, GB and COM districts, with additional requirements in the Aquifer Protection District .

**Table 3-9: Distribution of Land by Zoning District**

Zoning District	Acres	Percent of Total Acreage
Rural/Outlying Residential (RO)	10,638	72.2%
Residential/Rural (RR)	2,339	15.9%
Residential/Village (RV)	1,648	11.2%
Commercial (COM)	60	0.4%
General Business (GB)	52	0.4%
TOTAL:	14,738	100%

Source: MassGIS

The flexible development provision encourages preservation of open land by offering incentives to a developer to cluster development. The regulations governing the subdivision of land also have provisions to promote the preservation of open space. The Alternative Procedures Plan (APP) provides less stringent requirements for the subdivision of land with the intent to move development away from the road frontage.

There are currently two conventional subdivisions and one APP in Leverett. Laurel Hill, a 20-lot housing development also includes 61 acres of Common Land, or conservation land, within the privately-owned Laurel Hill housing community. The Echo Lake cottages (Echo Lake is the old name for Leverett Pond) were originally intended as summer cottages (and the dam was raised to make this area attractive for recreation), but most are now winterized and could be considered another residential community in town.

### D.3.2 Cost of Community Services

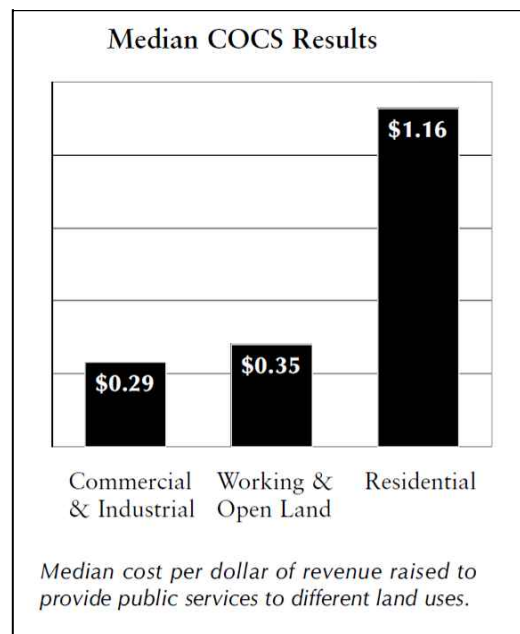
The challenge for Leverett and other communities is to find a model for growth that protects vital natural resource systems and maintains a stable property tax rate. In designing the model, it is important to understand the fiscal impact of different land uses, which can be calculated based on the relationship of property tax revenues generated to municipal services used. Although protected open space typically has a low assessed value and thus generates low gross tax revenues, municipal expenditures required to support this use are typically much lower than the tax revenue generated.

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 residential development.

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

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



- ❖ 79% of fiscal revenue in fiscal year 2008 was generated by residential land, 9% was generated by commercial land, 9% by industrial land, and 3% by farm and open land.
- ❖ 90% of expenditures were used to provide services for residential land compared with 5% for commercial land, 4% for industrial land, and 1% 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.

These findings support open space and farmland preservation, and commercial and industrial development, as a way to help towns balance their budgets. 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.

The long-term impacts of these strategies need to be considered. Patterns of commercial and industrial uses vary considerably between towns but all communities need to consider the impact of commercial and industrial development on the overall quality of life for residents. Increased industrial development could generate jobs as well as an increased demand for housing in town. Permanently protecting a large portion of the town's open space and farmland from development could provide locally grown food and jobs, but may also jeopardize the ability for future generations to determine the best use for the land. It also can increase the cost of the remaining available land, making affordable housing development more difficult.

Additionally, the current capacity of different services in town is a key factor when considering what types of development to encourage. If a community is near or at capacity for services such as police, fire, water, roads, or schools, any additional population growth could be quite costly as these services would need to be expanded. However if a community has an excess in service capacity in these areas, new residential growth would not necessarily be a strain on the town's budget.<sup>12</sup> In a climate of declining school enrollment, while acknowledging that home owners with children cost the town more than they pay in taxes, a community might determine that they want to attract families with children in order to maintain a valued community school.

The best types of commercial and industrial development to encourage in Leverett might have some of the following characteristics: locally owned and operated; in the manufacturing sector; being a "green industry" that does not use or generate hazardous materials; businesses that add value to the region's agricultural and forest products; and businesses that employ local residents.

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<sup>12</sup> *Cost of Community Services Studies: Making the Case for Conservation*. Julia Freedgood, 2002.

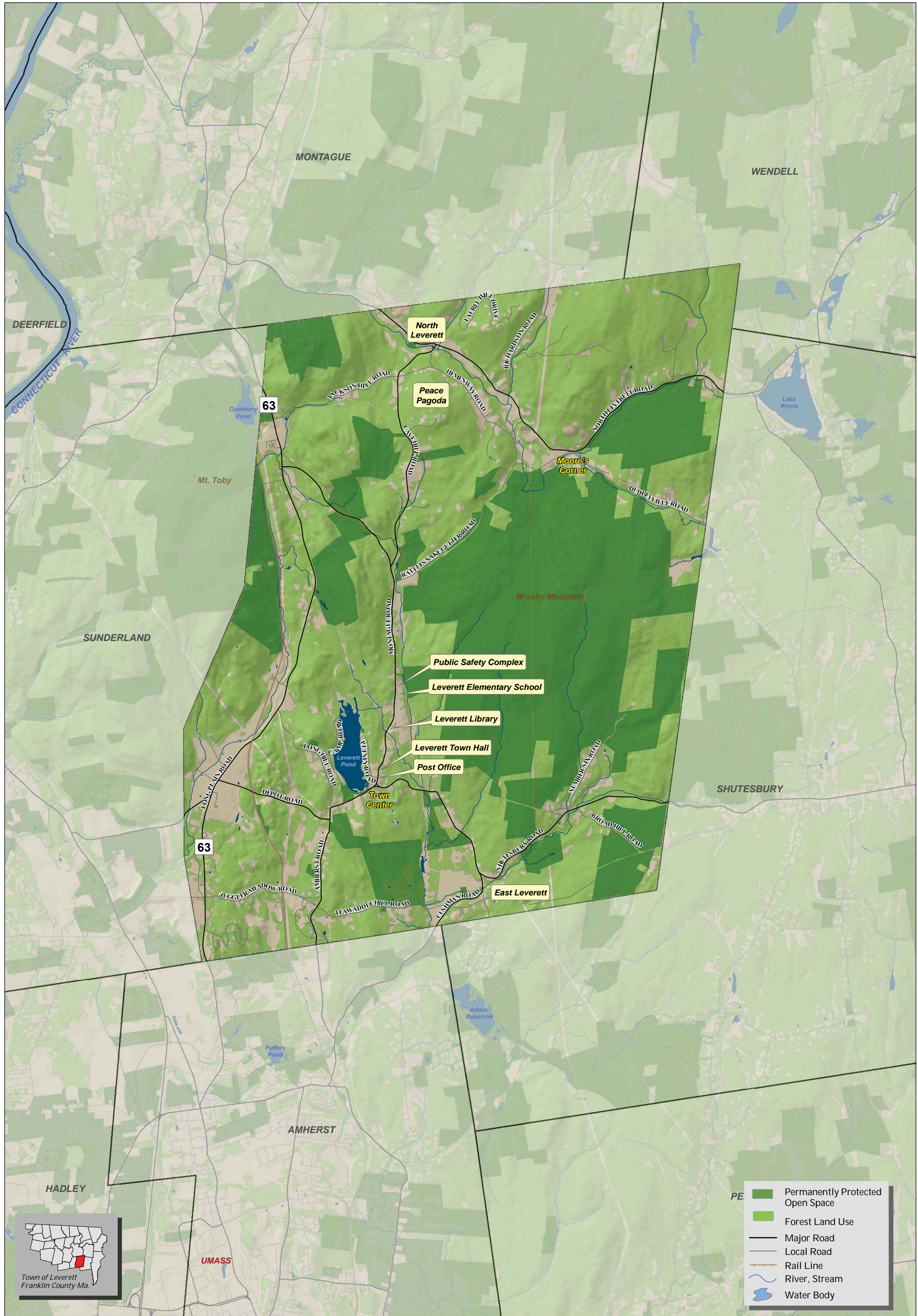
It is also important to consider that successful commercial and industrial development often generates increased demand for housing, traffic congestion and some types of pollution. Therefore, the type, size, and location of industrial and commercial development require thorough research and planning.

The 2004 Community Development Plan concluded that residential development should be focused in a few areas which could serve as small village centers with slightly higher density housing, such as senior apartments, a few businesses, and civic uses. The Community Development Plan Committee identified four potential areas for such a mix of uses: 1) Leverett Coop area; 2) Leverett Center with the Town Hall and Post Office; 3) the area near the Elementary School; and 4) the Town Library and Public Safety Complex. The fourth area, near the junction of Depot Road and Route 63, was selected because of its location near Route 63, an important inter-town and inter-county corridor. It was also selected because of the availability of land in that area for development. However this area, which is currently farmland, could potentially be preserved as open space. Another issue is that the area, which is included in a Zone II Wellhead Protection Area, has been identified as a potential future water supply for the town.

For Leverett, an approach that encompasses both appropriate business development and conservation of natural resources will best satisfy the desires of residents to maintain their community character while offsetting the tax burden. By continuing to pursue growth management strategies that include active land conservation and zoning measures that balance development with the protection of natural resources, Leverett will be able to sustain and enhance the community's rural village character and help to maintain a high quality of life for residents.

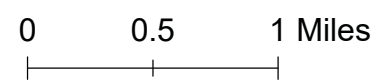


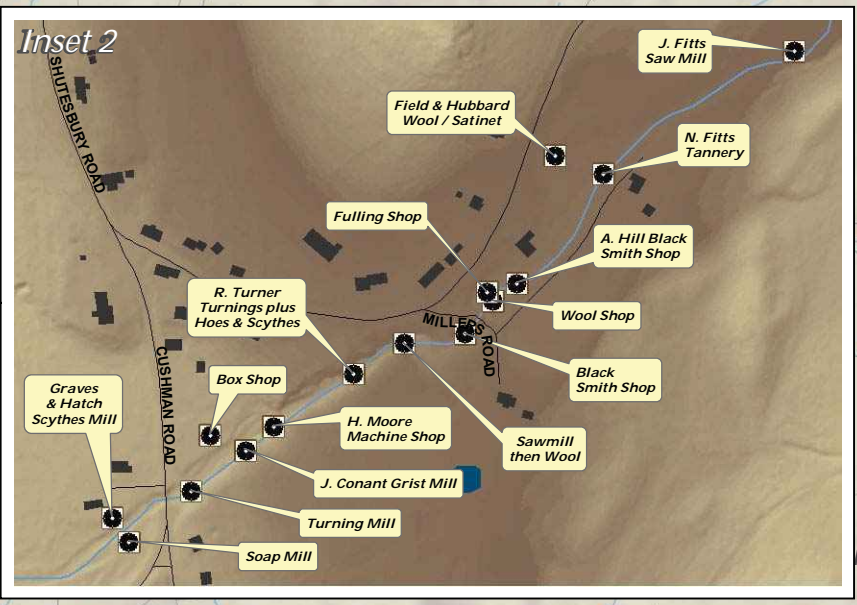
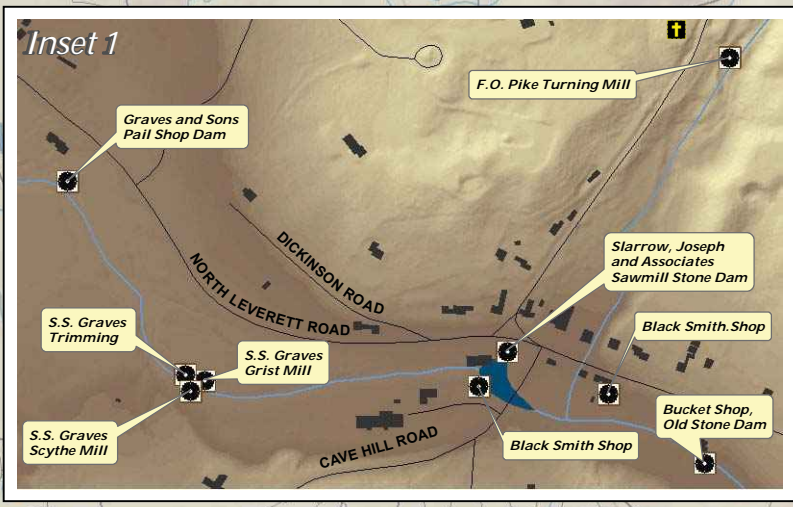
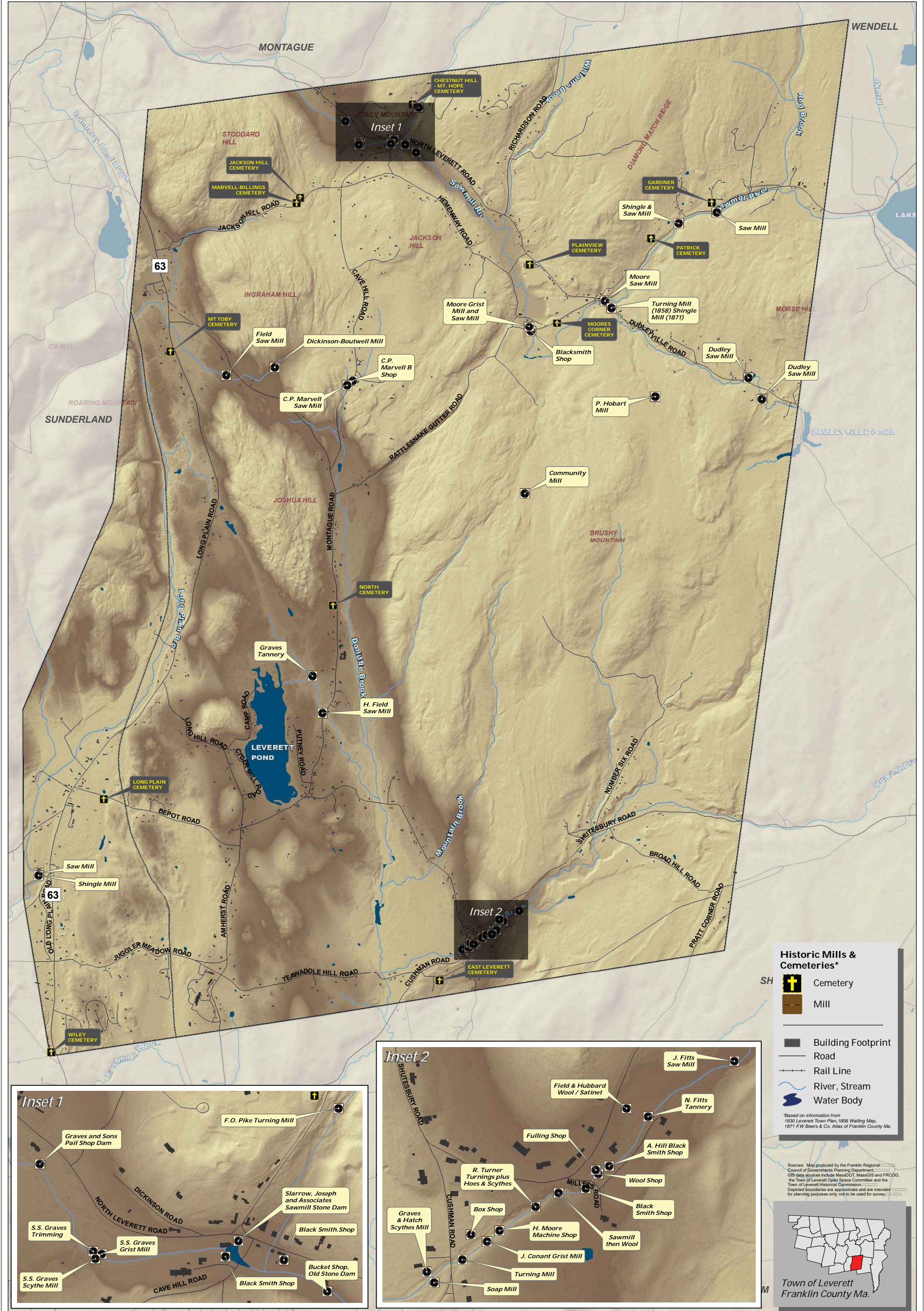
**Fox (Lori Lynn Hoffer)**



Town of Leverett  
Open Space &  
Recreation Plan 2018-2019

Regional  
Context Map





**Historic Mills & Cemeteries\***

- Cemetery
- Mill
- Building Footprint
- Road
- Rail Line
- River, Stream
- Water Body

\*Based on information from 1830 Leverett Town Plan, 1858 Walling Map, 1871 F.W. Beers & Co. Atlas of Franklin County Ma.

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

Town of Leverett  
Franklin County Ma.

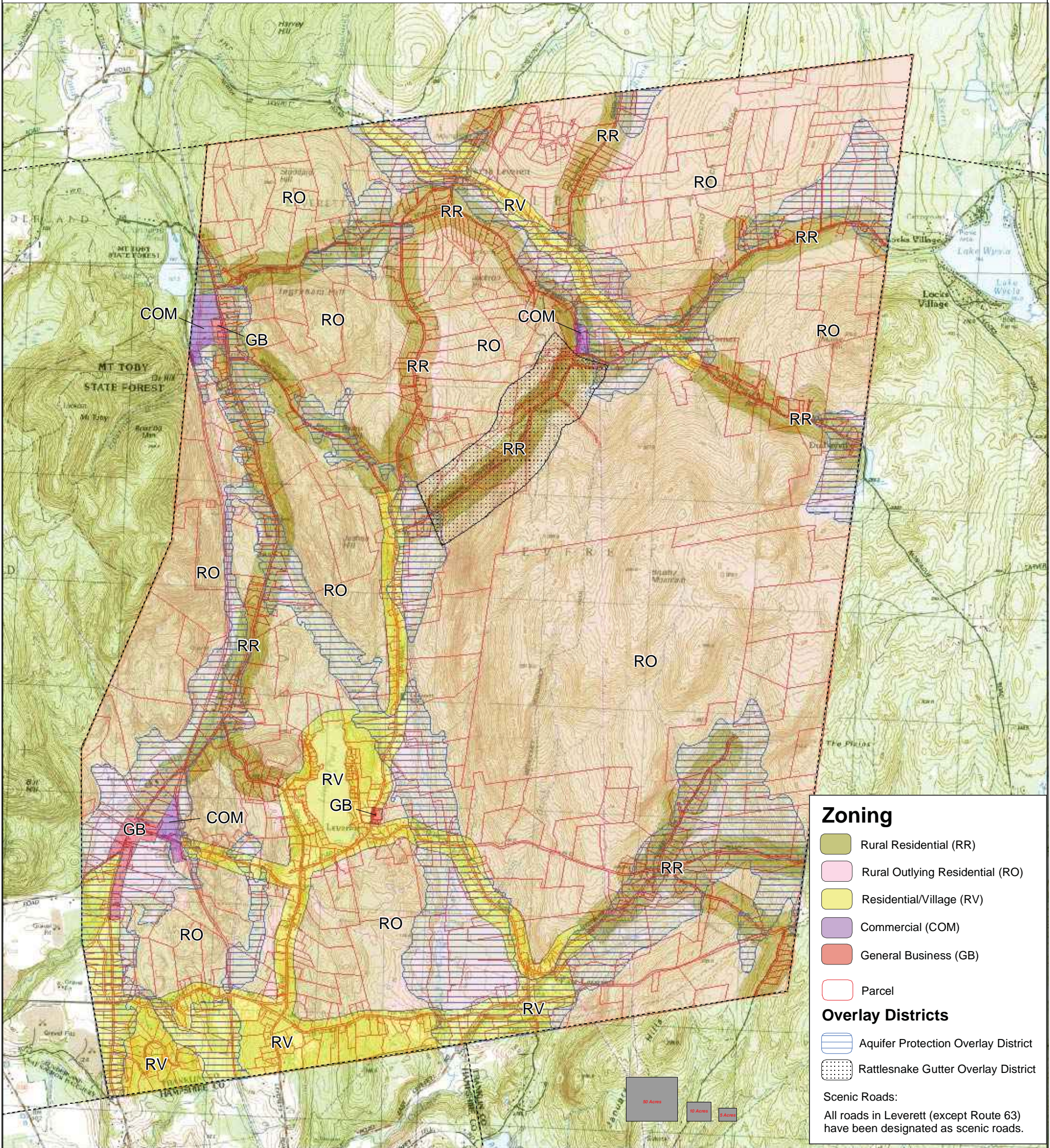
Town of Leverett  
Open Space &  
Recreation Plan 2018-2019

Historic Mills &  
Cemeteries

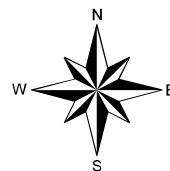


# Town of Leverett Official Zoning Map

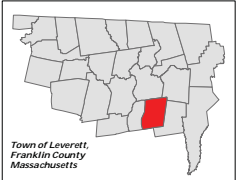
March 11, 2008



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



**Map Sources:**  
Map produced by The Franklin Regional Council of Governments Planning Department. GIS data sources include the FRCOG Planning Department, the Massachusetts Highway Department and MassGIS. Digital data obtained from MassGIS represent the efforts of the Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 017-626-1000.  
USGS 7.5 minute series topographic quadrangles scanned to create digital USGS 7.5 minute ArcInfo coverages. The resulting scanned map is projected into NAD83 Massachusetts State Plane meters. Data provided by MassGIS.  
Zoning data provided by the Town.  
Note: Depicted boundaries are approximate and are intended for planning purposes only. Portions of the source data were obtained from 1:100,000 scale maps, therefore the accuracy of the line work on this map is +/- 100 feet. The boundaries of the town's zoning districts have been snapped to the current Massachusetts Highway Department Road Inventory file. The road inventory file differs than the USGS roads in places therefore inaccuracies may exist when viewing the USGS overlay.



March 11, 2008

Map compiled by Ryan Cleary, FRCOG Planning Dept. 3/8/08, rjoseph@frcog.org, jerry@planning.net, and m...



# SECTION

## 4

### **ENVIRONMENTAL INVENTORY AND ANALYSIS**

This section of the Leverett Open Space and Recreation Plan provides a comprehensive inventory of the natural resources and the significant cultural resources within the Town of Leverett. The purpose behind any inventory is to provide a factual basis upon which assessments can be made. The environmental inventory in this case identifies and qualifies the town's soils, special landscape features, surface waters, aquifers, vegetation, fisheries and wildlife, and unique environments and scenic landscapes.

The section entitled *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 values, public access, and any current or potential quality or quantity issues. Leverett'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. Leverett'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.

The scenic landscape of the Town of Leverett 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. One way to understand the impact of development on natural resources is to study the *ecosystems* of the town and the region.

#### **A. DOCUMENTING AND MAPPING ECOSYSTEMS**

An ecosystem is a concept that describes how 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, including ecological services and cultural amenities. Wetlands, for example, trap and remove sediments, nutrients and toxic substances from surface water. They recharge water to the ground, retain it during droughts, and store floodwaters during and after storms, preventing damage to public and private property. Cultural amenities include the recreational use of open spaces, the quality of life benefits that are maximized by maintaining the area’s rural character and scenic beauty, and the direct and indirect beneficial impacts that well-conserved natural resources, such as good drinking water and open spaces, have on the local economy.

Just as the Town of Leverett contains multiple and varied ecosystems, the state of Massachusetts, while relatively small, has many diverse ecosystems and habitats. Documentation and mapping of such ecosystems and habitats – and their associated flora and fauna – can be a first step toward protecting and preserving these resources.

### **A.1 BioMap2**

In 2010 The Massachusetts Department of Fish and Game and The Nature Conservancy launched *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*.<sup>1</sup> This project, produced by the Natural Heritage and Endangered Species Program (NHESP), is a comprehensive biodiversity conservation plan for Massachusetts, and endeavors to protect the state’s biodiversity in the context of projected effects of climate change.

*BioMap2* combines NHESP’s 30 years of rare species and natural community documentation with the Division of Fish and Wildlife’s 2005 State Wildlife Action Plan (SWAP).<sup>2</sup> It also integrates The Nature Conservancy’s assessment of ecosystem and habitat connections across the State and incorporates ecosystem resilience in the face of anticipated impacts from climate change. *BioMap2* data replace the former BioMap and Living Waters data.

The following are the core findings summed up in BioMap2’s Executive Summary.

*Core Habitat Statewide Summary:* Core Habitat consists of 1,242,000 acres that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Core Habitat includes:

- ❖ Habitats for rare, vulnerable, or uncommon mammal, bird, reptile, amphibian, fish, invertebrate, and plant species;
- ❖ Priority Natural Communities;
- ❖ High-quality wetland, vernal pool, aquatic, and coastal habitats; and
- ❖ Intact forest ecosystems.

*Critical Natural Landscape Statewide Summary:* Critical Natural Landscape (CNL) consists of 1,783,000 acres complementing the Core Habitat, including large natural Landscape Blocks that provide habitat for wide-ranging native species, support intact ecological processes, maintain

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<sup>1</sup> <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/land-protection-and-management/biomap2/>

<sup>2</sup> <http://www.mass.gov/eea/agencies/dfg/dfw/>

connectivity among habitats, and enhance ecological resilience. The areas include buffering uplands around coastal, wetland and aquatic Core Habitats to help ensure their long-term integrity. CNL, which may overlap with Core Habitat, includes:

- ❖ The largest Landscape Blocks in each of 8 ecoregions; and
- ❖ Adjacent uplands that buffer wetland, aquatic, and coastal habitats.

**Table 4-1: *BioMap2* Statewide Summary Total Acres and Acres Protected in Perpetuity**

	<b>Total State Acres</b>	<b><i>BioMap2</i> State Acres Protected</b>	<b>Percent of State Land Protected</b>	<b>Total Leverett Acres</b>	<b><i>BioMap2</i> Leverett Acres Protected</b>	<b>Percent of Leverett Land Protected</b>
<b>Core Habitat</b>	1,242,000	559,000	24%	8,027	3,519	44%
<b>Critical Natural Landscape</b>	1,783,000	778,000	34%	9,899	4,091	41%
<b><i>BioMap2</i> Total (with overlap)</b>	2,092,000	861,000	40%	N/A	N/A	N/A

## **A.2 NHESP Priority Habitats**

Priority and Estimated Habitats is a program administered by NHESP. Identification and mapping of Priority and Estimated Habitats is based on the known geographical extent of habitat for all state-listed rare or endangered species, both plants and animals, and is codified under the Massachusetts Endangered Species Act (MESA). Habitat alteration within Priority Habitats is subject to regulatory review by the Natural Heritage & Endangered Species Program. Priority Habitat maps are used for determining whether or not a proposed project must be reviewed by the NHESP for MESA compliance.<sup>3</sup>

### A.2.1 Benefits of *BioMap2* and NHESP Priority Habitats

On the statewide level, mapping Core Habitat and Critical Natural Landscapes 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, Leverett can use this information to better understand where the town’s ecosystems and habitats fit into the bigger picture. For example, a small parcel of land could be a key link to two larger, intact ecosystems.

On an individual landowner level, *BioMap2* – as well as NHESP Priority and Supporting Habitats – is an important tool that can be used to apply for grants to help improve, manage and monitor certain lands. An example is the Mass Wildlife Landowner Incentive Program, which helps fund efforts to maintain grasslands and create areas of young tree and shrub growth (early woodlands) to enhance wildlife habitat, with preference given to land that is classified as, or located nearby, NHESP areas.

<sup>3</sup> <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/>

Information and mapping from *BioMap2* and NHESP Priority Habitats will be referenced throughout this section on Environmental Inventory and Analysis. BioMap2 Core Habitat covers 8,027 acres in Leverett, or nearly 55 percent of the town’s total land area. NHESP Priority Habitats for Rare and Endangered Species are shown on the Scenic Resources & Unique Environments Map at the end of this section. BioMap2 Core Habitat and Critical Natural Landscapes in Leverett can be viewed at [http://maps.massgis.state.ma.us/dfg/biomap/pdf/town\\_core/Leverett.pdf](http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Leverett.pdf).

### **A.3 Resiliency to Climate Change**

In 2011, the Massachusetts Executive Office of Energy and Environmental Affairs issued the *Massachusetts Climate Change Adaptation Report*.<sup>4</sup> Climate change will result in potentially profound effects on the economy, public health, water resources, infrastructure, coastal resources, energy demand, natural features, and recreation throughout the state. The issue of climate change, and in particular climate change adaptation, is complex. The impacts of climate change will vary not only geographically but also temporally—some of the impacts may not be felt for another 30 years or further in the future, while others are already upon us. When considering land conservation strategies and suitable sites for recreation facilities, climate change adaptation and resiliency should enter into the decision-making process of the town.

The Nature Conservancy (TNC) released a report in 2013 entitled “Resilient Sites for Terrestrial Conservation in the Northeast and Mid-Atlantic Region.”<sup>5</sup> 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 geophysical settings and evaluating them for landscape 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 geophysical settings (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.<sup>6</sup>

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<sup>4</sup> <http://www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html>

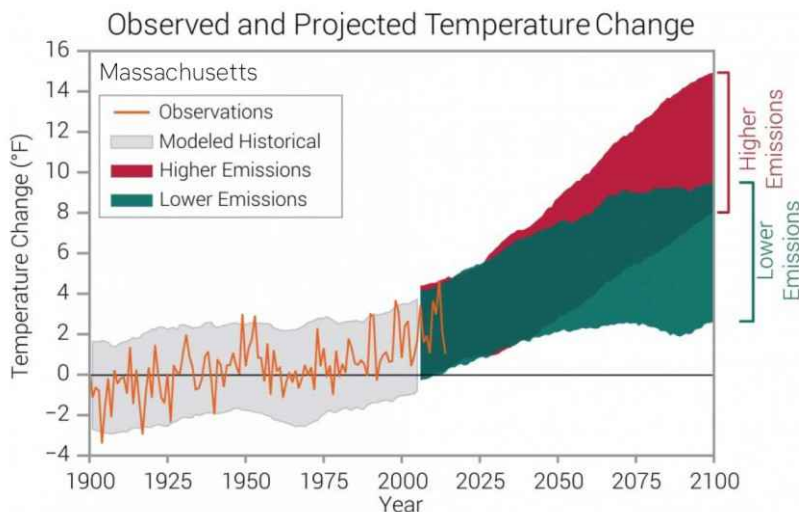
<sup>5</sup> <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/terrestrial/resilience/Pages/default.aspx>

<sup>6</sup> <http://www.mass.gov/eea/grants-and-tech-assistance/grants-and-loans/dcs/grant-programs/landscape-partnershipprogram.html>

Annual precipitation averaged around 46" between 1971 and 2000 in the Connecticut Basin, which encompasses the entire Town of Leverett.<sup>7</sup> Precipitation in the winter season is expected to experience the greatest change between now and the end of the century, with an increase of 1-25% by mid-century (up 6 inches more by the 2050s), and of 7-37% by end of century (potentially increasing more than 8 inches by the 2090s). Annual and seasonal projections for consecutive dry days, or for a given period, the largest number of consecutive days with precipitation less than 1 mm (~0.04 inches), are variable throughout the 21st century. Seasonally, the fall and summer seasons are expected to continue to experience the highest number of consecutive dry days. The fall season is expected to experience an increase of 0-3 days in consecutive dry days by the end of the century.

Climate projections for Massachusetts indicate that in future decades, winter precipitation could increase, but by the end of the century most of this precipitation is likely to fall as rain instead of snow due to warmer winters. There are many human and environmental impacts that could result from this change including reduced snow cover for winter recreation and tourism, less spring snow melt to replenish aquifers, higher levels of winter runoff, and lower spring river flows for aquatic ecosystems.<sup>8</sup>

Between 1971 and 2000, the average annual temperature was 47 degrees Fahrenheit. Average temperatures ranged from 25 degrees Fahrenheit in winter to about 68 degrees in summer. The Connecticut basin is expected to experience increased average temperatures throughout the 21st century. Maximum and minimum temperatures are also expected to increase throughout the end of the century. These increased temperature trends are expected for annual and seasonal projections. Seasonally, maximum summer and fall temperatures are expected to see the highest projected increase throughout the 21st century, but minimum winter and fall temperatures are also expected to increase throughout the 21st century.<sup>9</sup>

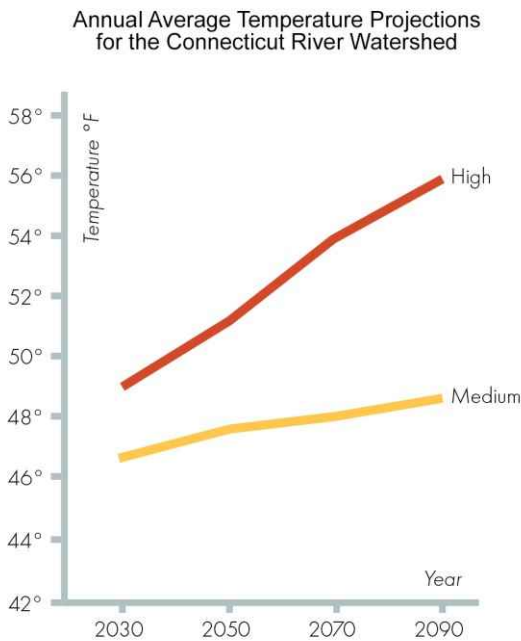


<sup>7</sup> Massachusetts Climate Change Projections 2017, Northeast Climate Science Center, UMass  
Downscaled Projections for Major Basins in MA. [www.resilientma.org](http://www.resilientma.org).

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

The above graph demonstrates temperature changes in the State of Massachusetts between the years 1900 and 2100. Temperature projections for the rest of the 21<sup>st</sup> century are based on models used by the International Panel on Climate Change (IPCC) and two scenarios of future greenhouse gas emissions: ‘medium’ and ‘high.’ A ‘medium’ scenario (shown in the graph as “Lower Emissions”) assumes a peak in global greenhouse gas emissions around 2050, which then declines rapidly over the second half of the century due to carbon reduction efforts. A ‘high’ scenario assumes a “business as usual” continuation of the current emissions course. These scenarios represent different pathways that society may or may not follow, to reduce emissions through climate change mitigation measures. For more information, see <http://resilientma.org/resources/resource::2152>



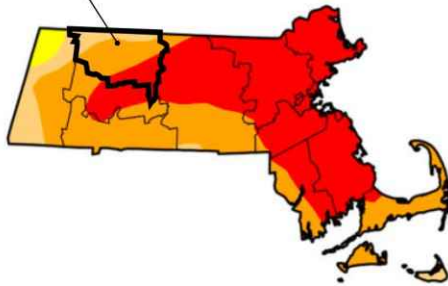
The temperature projections shown in this graph have been localized to accuracy at the watershed scale, by researchers from the Northeast Climate Science Center at the University of Massachusetts, Amherst. These highly valuable projections demonstrate how the climate is likely to transform in the Connecticut River Watershed over the course of the 21st century, based on climate models used by the IPCC and ‘Medium’ and ‘High’ emissions scenarios, as defined above. See <http://resilientma.org/resources/resource::2152> for more information.

In the summer of 2016, Massachusetts was gripped with the worst drought conditions in recent memory. The prolonged period of warm, dry weather served as a stark reminder of how residents, communities, and industries

depend upon the Commonwealth’s fresh water resources. On September 21 of that year, the U.S. Department of Agriculture designated Franklin County, along with most other parts of the state, as primary natural disaster areas due to the ongoing drought and its effect on agriculture. A small projected decrease in average summer precipitation could combine with higher temperatures to increase the frequency of episodic droughts in the future.

**U.S. Drought Monitor  
Massachusetts  
September 13, 2016**

Franklin County



**Intensity:**

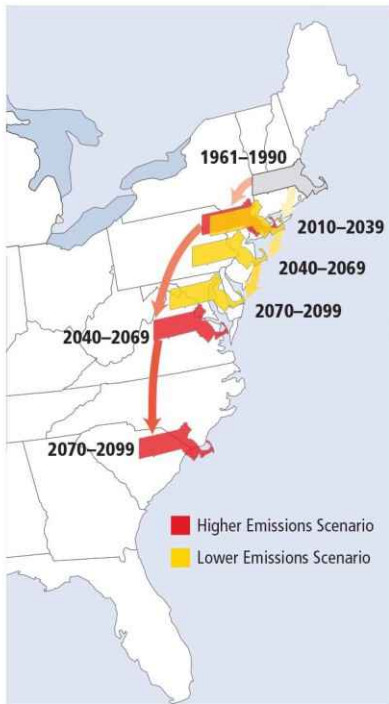
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Author: Eric Luebbehusen, USDA

Droughts will create challenges for local water supplies by reducing surface water storage and the recharge of groundwater supplies, including private wells. Droughts can weaken tree root systems, making them more susceptible to topping during high wind events. More frequent droughts can also

exacerbate the impacts of flood events by damaging vegetation that could otherwise help mitigate flooding effects. (<http://resilientma.org/resources/resource::2152>)

**Projected Summer Temperatures  
in Massachusetts by 2099**



Changes in average summer heat index will strongly alter how summer feels to residents in the Northeast. Red arrows in the above map track what summers in Massachusetts could feel like over the course of this century if we follow a higher emissions pathway. Yellow arrows track what Massachusetts could feel like on a lower emissions pathway. Source: Union of Concerned Scientists (2006).

The growing season (last frost in spring to first frost in fall) has roughly extended from May 8 to October 1, but varied greatly with topography. The long-term average historically is 146 days.

Changing weather patterns have already begun to affect the frequency, intensity, duration and geographic extent of extreme weather event. As the weather continues to change over the coming decades, we can expect to see the following effects:

- ❖ Higher temperatures
- ❖ Shorter winters
- ❖ More frequent & intense storms
- ❖ Droughts

The number of days with temperatures over 90° are predicted to increase. Annually, the Connecticut basin is expected to see days with daily maximum temperatures over 90 °F increase by 10 to 35 more days by mid-century, and 15 to 76 more days by the end of the century. Seasonally, summer is expected to see an increase of 8 to 30 more days with daily maximums

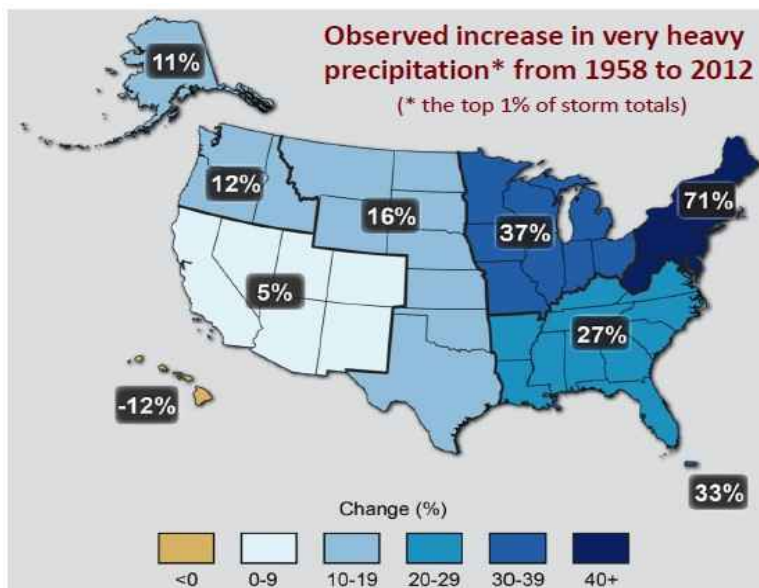
over 90 °F by mid-century. By end of century, the Connecticut basin is expected to have 12 to 60 more days over 90 °F.<sup>10</sup>

Increased demand could strain energy infrastructure and increase the potential for widespread brownouts or blackouts to disrupt service. Higher temperatures will likely require more frequent maintenance to address deterioration of asphalt roads, buckling of railroad tracks, and thermal expansion of bridges.

Between 1971 and 2000, our region experienced an average of 7 days with precipitation over 1". By the end of the century, it is predicted that Western Massachusetts could have 5 additional days of rainstorms that dump over 1 inch of rain over the course of the year. On October 29 and 30, 2017, Franklin County experienced 2+ inches of rain and 40 to 50 mph winds due to moisture associated with the remnants of Tropical Storm Philippe, causing localized flooding and downed power lines.

Figure 4-1 below illustrates the observed increase in very heavy precipitation from 1958 to 2012. New England has experienced a striking increase of 71% over this period, nearly twice the next highest increase of 37% in the Midwest.

**Figure 4-1. Observed Increased Precipitation**



Source: <https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing>

Previous climate studies have been based on the premise that the extreme rainfall series do not change through time. Therefore it is assumed that older analyses reflect current conditions. Recent analyses show that this is not the case, particularly in New York and New England where the frequency of 2 inch rainfall events has increased since the 1950s and storms once considered

<sup>10</sup> Ibid.



a 1 in 100 year event have become more frequent. Such storms are now likely to occur almost twice as often.<sup>11</sup>

Environmental effects that are anticipated to result from increased precipitation include:

- ❖ Flooding
- ❖ Erosion
- ❖ Impacts to water quality and quantity
- ❖ Loss of species diversity
- ❖ Invasive pests and plants
- ❖ Wetland soils becoming less absorptive
- ❖ More stormwater runoff, and less groundwater recharge

The drought of 2016 was a reminder of the widespread impacts droughts can have on our region. In addition to impacting the water quality and quantity of rivers, streams and other water bodies, drought can fuel wildfires. In Leverett, there were 5 brush fires reported in 2016, the highest number for any one year since 2010.

The health of the town's natural resources directly affects the climate change resiliency of the municipal infrastructure, public safety and economic and physical welfare of watershed residents. Societal risks associated with changing weather include:

- ❖ Heat-related illness and death
- ❖ Danger from storms & flooding
- ❖ Insect-borne diseases
- ❖ Allergies & Pollen
- ❖ Waterborne disease & algal blooms
- ❖ Vulnerable populations

Maintaining healthy and intact wetlands, floodplains, riparian corridors, forests and other vegetated open spaces will help to mitigate the impacts from severe storm events and flooding. To assist with this, Leverett has applied for a Municipal Vulnerability Preparedness (MVP) Planning Grant and if awarded will be able to address climate change impacts and improved the town's resiliency. In addition, the town is currently updating its Multi- Hazard Mitigation Plan, which evaluates the town's risks from various hazards such as flooding and hurricanes and recommends ways to minimize the damages to Leverett's infrastructure, as well as its natural, cultural, and historic resources.

## **B. 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.

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<sup>11</sup> Northeast Regional Climate Center (NRCC) and Natural Resources Conservation Service (NRCS), Cornell extreme precipitation tool: <http://precip.eas.cornell.edu/>

## **B.1 Topography**

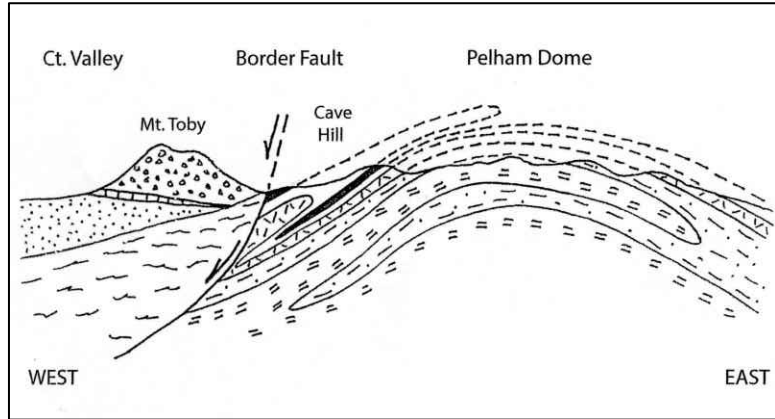
The landscape in Leverett is characterized primarily by rolling wooded hills with moderate to rugged uplands arising from the eastern side of the Connecticut River Valley. Four main waterways drain into the Connecticut River: Long Plain Brook along the western border; Sawmill River in North Leverett; Roaring Brook in East Leverett; and Doolittle Brook through the southeastern section of town. Significant points of high elevation include Brushy Mountain (1,260 feet) in the east-central section, Joshua Hill (870 feet) and Diamond Match Ridge (1,123 feet) in the mid-western section, Jackson Hill (921 feet) in the northern section, and parts of Mt. Toby (1,250 feet) on the western town boundary.

## **B.2 Bedrock Geology**

The bedrock geology in Leverett is a visible testament to the area's turbulent geologic past. Even before the glacial advance, Leverett's landscape bore the scars of at least two major tectonic collisions, as well as the growth and breakup of a supercontinent. Leverett's unique geology records not only some of the key events in the evolution of North America, but also a special view of the forces and processes that are shaping the Earth today. The geology of Leverett has attracted researchers, teachers, and students for decades.

Most of Leverett is underlain by metamorphic rocks that range in age from the Precambrian to the middle Paleozoic Eras (615 to 400 million years). These metamorphic rocks are the deformed remains of sedimentary and volcanic rocks deposited in shallow seas along the margin of the North American continent. These rocks were extensively deformed and metamorphosed (transformed by heat and pressure) during the mountain-building events that formed the ancestral Appalachian Mountains over 350 million years ago. The mountains were produced during the collision of several large continents, including Africa, South America, and Europe, with North America. In fact, Leverett sits on rocks (continental crust) that were originally part of Africa or South America. During the mountain building, Leverett's rocks were buried between five and twenty miles below the surface. They were heated to temperatures in excess of 1,000 degrees Fahrenheit and transformed ("metamorphosed") into rock types known as gneiss and schist. Although the metamorphic rocks in Leverett are somewhat similar in general character, they can be easily divided into two groups by age and region of origin.

The oldest rocks in Leverett are the Dry Hill Gneiss (~613 million years old) and the Poplar Mountain Gneiss (~600 million years old). They are some of the oldest rocks east of the Berkshires and west of Boston. The Dry Hill Gneiss is found in the western part of Leverett, and is prevalent on Brushy Mountain, North Leverett, Rattlesnake Gutter and parts of East Leverett. Both the Dry Hill Gneiss and Poplar Mountain Gneiss can be seen along Cave Hill Road, and along the trails in the Cave Hill Conservation Area. These two rock units are part of a larger feature named the Pelham Dome, a large upland of Precambrian rock stretching from Northfield south to Belchertown. These rocks were not formed in or on North America, but rather were deposited on Gondwanaland, a separate continent made up of present-day Africa and South America. The exotic rocks, locally called the Gander Terrane, broke from Gondwanaland and collided with North America during the Salinic Orogeny (440-420 million years ago).



**A cross section of the Cave Hill Conservation Area (Mike Williams, UMass Amherst)**



**Cliffs along the Cave Hill Conservation Area trail exhibiting metamorphic folding. Photograph by Miho Connolly.**

East and west of the Pelham Dome, younger rocks of Ordovician to Devonian age (approximately 450 to 350 million years ago) are preserved. In Leverett, they occur in a roughly north-south band between Montague Road and Rt. 63, and are locally draped over the Precambrian rocks. These units are now metamorphic rocks (gneisses, quartzites, and schists), and all have their origins in North America. The older units include the Four Mile Gneiss, originally a volcanic rock, and Partridge Formation, originally deposited as mud in a deep ocean basin. The youngest unit in the sequence, from 60 to 100 million years younger, is the Erving Formation, a green-colored schist, originally of volcanic origin. The rocks were deformed and metamorphosed when

a micro-continent called Avalon collided with North America in the Acadian orogeny (420-380 Ma). The Avalon Terrane makes up much of the land under Boston today. During the mountain building, Leverett's rocks were buried, deformed, metamorphosed, becoming the gneisses and schists we see today. The rocks now exposed at the surface formed the deep roots of these

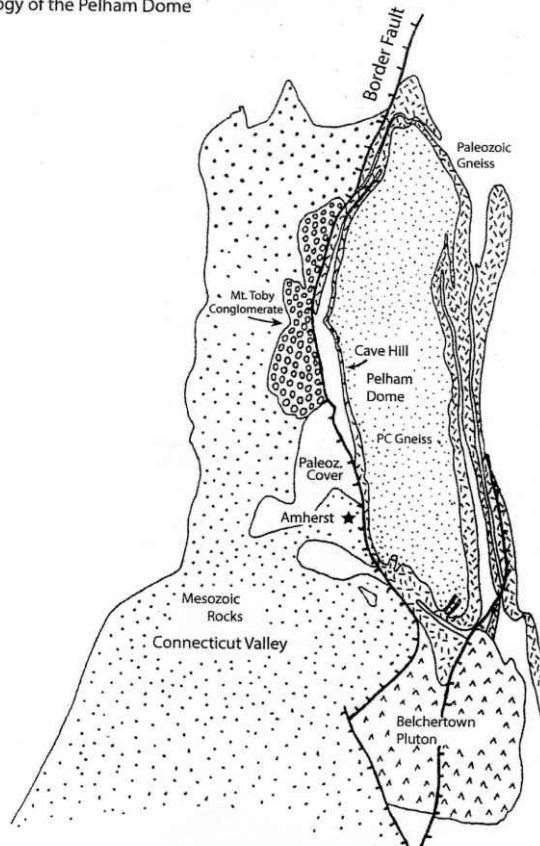
ancestral “Acadian” mountains, which were probably once as grand as the Alps or Himalayas. Examples of the rocks can be seen in the Cave Hill Conservation Area where some of them form large cliffs, impressive outcrops, and the roots of the Appalachian Mountains.



**Mt Toby Red Sandstone/mudstone/ conglomerate.**  
**Photograph from Dynamic Digital Map of New England.**

After the Acadian Orogeny, this part of North America was relatively quiet for perhaps 100 million years, but by the early Mesozoic (~250 million years ago) motions of the tectonic plates had formed the supercontinent Pangea with all the major continents connected into one huge landmass. What is now northwest Africa was juxtaposed next to eastern North America. Slowly, the super-continent began to break up, with North America moving westward and Africa and Europe moving eastward. The western edge of Leverett preserves evidence of the great divergence. The red sandstones, conglomerates, and black basaltic volcanic rocks found on Mount Toby, and in Leverett west of Route 63 are Mesozoic rocks (~200 million years) deposited in a rift basin as North America drifted away from Africa and Europe. The contact between the Mesozoic sediments and the older metamorphic rocks is marked by the Eastern Border Fault. The trace of this long-extinct fault is located near the railroad tracks by Route 63. The Connecticut Valley is one of several rifts that formed during continental stretching. The major split formed to the east of Leverett (and eventually became the Atlantic Ocean), but the Connecticut River Valley with its sedimentary rocks and lava flows is a testament to plate tectonics and a natural classroom for studying the continental break-up process.

Geology of the Pelham Dome



**Diagram of the Eastern Border Fault through Leverett and environs (Mike Williams, UMass)**

### B.2.1 Surficial Geology

Most of Leverett’s surficial geologic features were formed in the last 20,000 years during the waning stages of the last glacial advance (the Wisconsin period) and the time that has elapsed

since the disappearance of the ice. This time interval can be conveniently subdivided into three stages: (1) the last stages of glacial ice advance through central New England (20,000 to about 15,000 years ago); (2) a period of time when the ice front retreated and glacial melt waters redistributed the pulverized rock carried by the glacier (15,000 to about 13,000 years ago); and (3) the last 13,000 years when weathering processes (frost wedging and chemical weathering) along with the action of streams have made slight modifications to the landscape remaining after the glacial retreat. The second of these time periods (although the briefest) had the most influence on the Leverett landscape.

### B.2.3 Glacial Advance

The predominant legacy of the glacier itself is the rounded hills of the town. Though chemical weathering has destroyed most examples of glacial scratches, the shapes of the hills themselves indicate they were sculpted by ice moving in a generally southeasterly direction. The northwest sides of most hills (known as *roches moutonnées*) are gentler than their southeast slopes. These hills were polished by the ice on their "upstream" sides and plucked on the "downstream" sides, creating steep cliffs. The cliffs northwest of Rattlesnake Gutter Road, northwest of Number Six Road, and southwest of Dudleyville Road were probably formed in this fashion. These hills were most likely stripped of soil and left as bald knobs as the ice retreated, resulting in unusually low soil depths at these hilltops.

Another clear imprint of the former glacier is seen in depressions left in the bedrock surface. The upland swamps that dot the town in places like Diamond Match Ridge and Brushy Mountain are manifestations of these depressions. Leverett Pond, circled by small hills, occupies this kind of low spot. The pond is undergoing a succession of changes leading to swampland because of infilling by sediments and vegetation. Less dramatic, but certainly more pervasive, is the till cover left by the ice. Till is a mix of clay, sand, and rocks jumbled together by the bulldozing action of glacier ice. It forms heavy and poorly drained soils. In contrast, areas covered by glacial outwash usually have much more sand and gravel with well-drained soils. Areas dominated by till (as opposed to gravelly outwash) can be distinguished by stonewalls built of large rocks removed from fields if the land had formerly been used for agriculture.

### B.2.4 The Glacial Retreat

One of the most dramatic parts of the town's surficial geologic history was written during the relatively brief retreat of the glacial front northward up the Connecticut River Valley. Movement of surficial materials was far more rapid than it is today because very large quantities of water were discharged by the melting ice and the ground was strewn with debris upon which little vegetation had taken hold. As the glacial front retreated northward across town, each part of the surface took its turn being at the ice front. The retreat may not have been uniform in its rate; there is some indication that the ice may have paused near the town's northern boundary. Several noteworthy landmarks owe their origins to ice-margin processes in and near the present location of the Sawmill River. Two prominent town features are the relatively level surface of Long Plain and the smaller valley floor of Doolittle Brook that joins East Leverett Meadow near Still Corner. These areas formed when glacial melt waters deposited large quantities of gravel in

outwash plains when the ice front may have existed along a line connecting the tops of Stoddard Hill, Jackson Hill, and perhaps Morse Hill near Lake Wyola.



*Photograph of Rattlesnake Gutter courtesy Tom Walsh/Wikimedia Commons.*

Rattlesnake Gutter—the town's most spectacular natural feature—was also formed at this time. The Gutter, a cleft between Jackson Hill and Brushy Mountain, is a curiosity because it resembles a gorge of a considerable stream but lacks a headwater drainage from which such a stream could originate. The Gutter appears to have been formed by a fortuitous sequence of events between 18,000 and 14,000 years ago at the end of the last ice age. Although ice flow was

southerly during most of the ice age, striations or scratches left by the last ice movement in the Gutter are southwesterly, essentially parallel to the axis of the Gutter. Perhaps aided by an ancient fault through the Gutter, the ice scooped out much of the valley. Torrents of glacial melt water completed the job when the glacier was retreating from the central Massachusetts upland but still filled much of the Connecticut Valley. Not only did all of the waters of the present Sawmill River drainage pass through this low point, so did all of the melt waters from hundreds or even thousands of square miles of the continental glacier to the north. Thus the volume of water passing over the low point and then rushing precipitously down the Gutter must have been several times that of the present Sawmill River even at flood stage.

During this time the gorge must have presented an awesome sight indeed. The tremendous erosive power of this rushing water gouged out the till and bedrock of the floor of the Gutter over a relatively short period of time to a depth of nearly two hundred feet. After the abandonment of the Rattlesnake Gutter spillway, but before the ice had retreated northward beyond the vicinity of Stoddard Hill, a small lake existed in the valley of the Sawmill River. The lake was probably dammed by a lobe of ice near the present junction of North Leverett Road and Route 63 (northwest of Stoddard Hill). The lake existed long enough for a delta to form by the ancient Sawmill River originating from the ice front in the vicinity of Lake Wyola. This delta forms the flat plain where the village of Moore's Corner is located. The gravels of this delta and the associated materials deposited downstream constitute one of the town's valuable aquifer resources. The lake's spillway was probably along the present location of Jackson Hill Road.

#### B.2.4 Post-Glacial Landscape Modification

Relatively little has occurred in the past 14,000 years to further modify the landscape. Weathering, both chemical and mechanical, has degraded the glacially polished bedrock and smaller rock fragments in the till, creating the relatively thin soil cover that characterizes the

town. Downslope movement of soil and till has probably left hilltops in even poorer soil cover than they were when the glacier left. Glacial outwash surfaces have become dissected by streams. One particularly dramatic example is south of Bull Hill, where Long Plain Brook has carved a small gorge in sediments that had been deposited along the edge of glacial Lake Hitchcock. Frost wedging has probably loosened boulders from cliffs like those in Rattlesnake Gutter. The pace of soil removal from town by the action of streams and wind erosion was probably accelerated by agricultural practices over the past two hundred years.

### **B.3 Soils**

Soils sustain a diverse array of plant and animal life through the banking of nutrients and organic matter. They retain and release groundwater, and they produce food and a way of life for local residents. Wetland and riparian soils help to naturally regulate surface water flow and also provide habitats for some of the area's most unique species. Residents should take note that the glacial outwash soils— being well drained, even droughty, and mostly level— are also potential sites for development.

According to the United States Department of Agriculture (USDA) Soil Conservation Service Soil Survey for Franklin County, the soils of Leverett fall into two basic associations: the Hinckley-Merrimac and the Scituate and Essex soil associations. Both soil types consist primarily of stony glacial till with varying drainage characteristics. Large portions of the town's eight hills and other areas consist of shallow to bedrock Shapleigh soils. The large areas of Scituate and Essex soils with slowly permeable hardpan result in natural wetland development. In certain locales, postglacial outwash deposits have produced sandy well-drained Hinckley-Merrimac soils that are the predominant aquifers in town.

Approximately 1,494 acres of prime farmland soils are located within Leverett, consisting of roughly 10% of the town's area. These prime farmland soils are primarily located in northern Leverett along Jackson Hill Road, North Leverett Road, Cave Hill Road, Dudleyville Road and along the Sawmill River. In central Leverett, prime farmland soils can be found along Doolittle Brook east of Joshua Hill. In the southern part of town, they are located on both sides of Route 63 south of the intersection with Long Hill Road and along Teawaddle Hill from Amherst Road to Shutesbury Road, and continuing on both sides of Shutesbury Road to the town line. Due in part to the low percentage of prime farmland in Leverett, farming does not constitute a large portion of the town's economy, though many residents care for home gardens.

## **C. LANDSCAPE CHARACTER**

Leverett's landscape encompasses rolling hills and rock outcrops; mature forests of mixed hardwoods, hemlocks and pines; streams and scattered wetlands; and occasional pastures and fields. Its thirty-five miles of country roads—both paved and dirt—are generally lined with sheltering trees and bordered with stone walls that persist from the days of hillside farm fields and pastures. Leverett Pond and Rattlesnake Gutter are two special features of the landscape. The 102-acre pond in Leverett Center provides scenic views during all four seasons. The Gutter's narrow 1.6 mile-long gorge is lined with huge boulders and hemlock stands. The road,

now closed to vehicles, provides walkers and bikers with beautiful views of impressive rock outcrops, a high forest canopy, and a meandering, perennial stream.



Photograph courtesy Friends of Leverett Pond

Houses of all sizes and styles stand visible along roadsides or hidden in the woods in all sections of Leverett. Each section has its distinctive and beloved characteristics: Town Center with the 1845 Town Hall, unofficial town common with the Edna Emerson memorial garden, Post Office, Congregational Church, Leverett Crafts & Arts Center, old Field Memorial Library (now the Leverett Family Museum), and picturesque pond; bustling Moore's Corner with the Leverett Co-op, Moore's Corner Church, historical society building; North

Leverett with the Baptist Church, sawmill, and memories of Chapin's inimitable store; and East Leverett with the friendly and efficient Transfer Station. To all its residents and visitors, Leverett offers a peaceful rural atmosphere shared by the bears, barred owls, and other resident wildlife. The sounds and sights of farm animals and domestic companion animals are ubiquitous across town.

## **D. WATER RESOURCES**

Leverett's plentiful water resources include numerous rivers and streams, extensive wetlands, and Leverett Pond. The Water Resources Map at the end of this section shows the location of major watercourses, water bodies, and wetlands. The abundance of water resources is also reflected in the mostly reliable availability of groundwater for private and public wells and also in the number of former water-driven sawmills (see section on History of the Community). Most wetlands are protected by the Massachusetts Wetland Protection Act (1963) that requires property owners to seek approval from the Conservation Commission for certain activities (e.g., home construction, out-buildings, and clearing of vegetation) in or within one hundred feet of wetlands. The 1998 River Protection Act stipulates that landowners must seek similar approvals for work within two hundred feet of perennial rivers and streams. Additionally, the local Zoning Bylaw includes a Lake and Stream Protection District that restricts activities near perennial streams and large water bodies. Individuals seeking to do work in or near wetlands are advised to contact the Commission for details on what types of approvals are necessary to comply with the law.



## **D.1 Watersheds**

The Town of Leverett is situated entirely 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.)<sup>12</sup>

## **D.2 Surface Water**

There are approximately 103 acres of surface waters covering 0.7 percent of the surface area of the Town of Leverett, consisting of a number of rivers and streams, as well as Leverett Pond. A number of these rivers and streams have habitat for rare and endangered species that are affected by nonpoint source pollution and can be protected through good open space management and acquisition of lands where these bellwether species exist (see Rare and Endangered Species Table in Section E. Fisheries and Wildlife).

### D.2.1 Rivers and Streams

The Sawmill River flows from Lake Wyola in Shutesbury through North Leverett to the Connecticut River in Montague. According to the Massachusetts Natural Heritage and Endangered Species Program (NHESP), there are a total of fourteen Coldwater Fisheries Resource (CFR) streams in Leverett, including the Sawmill River:

1. Sawmill River
2. Chestnut Hill Brook
3. Cranberry Pond Brook
4. Doolittle Brook
5. Dudleyville Brook
6. Gardner Brook
7. Mountain Brook
8. Red Brook
9. Roaring Brook
10. Russellville Brook
11. Williams Brook

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<sup>12</sup> 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](https://www.fws.gov/refuge/Silvio_O_Conte/wildlife_and_habitat/endangered.html), accessed December 27, 2016.

12. Unnamed tributary to Cranberry Pond Brook
13. Unnamed tributary to Dudleyville Brook
14. Unnamed tributary to Sawmill River

According to the Massachusetts Division of Fisheries and Wildlife (MassWildlife), cold water fish resources (CFRs) 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.<sup>13</sup>

### D.2.2 Leverett Pond

Leverett Pond (formerly called Echo Lake or Fish Pond) is the only natural pond in town. The Pond has been dammed since before 1794, its waters used to power a tannery and sawmill downstream and probably other industries. Historic maps show that the water level has fluctuated dramatically since then, caused by periodic lack of use and drought. The present dam was improved in concrete following the 1938 hurricane. During further concrete improvements in 1980, the date “1938” was observed impressed in the apron. Today the pond includes about thirty-three acres of open water, sixty-two acres of emergent and aquatic bed vegetation, and eight acres of shrub swamp. The center of the pond is open water. Vegetation appears to be moving in from the northern and southern sections of the pond. The pond is an important resource for town residents and visitors alike. It is used for boating, canoeing, kayaking, fishing in summer and winter, skating, snowmobiling, and cross-country skiing.

The wetlands of Leverett Pond have received considerable attention. Emergent species found along the pond edges include cattails, water-willow (swamp loosestrife), bulrushes, soft rush, arrowhead, tear thumbs, bluejoint grass, barnyard grass, pickerelweed, blue flag iris, smartweeds, bur-reed, jewelweed, boneset, beak-rush, pipewort, marsh milkweed, beggar-ticks, and turtlehead. Shrub species associated with the pond's wetlands are willows, buttonbush, swamp rose, common elderberry, silky dogwood, speckled alder, and viburnums. Leverett pond has numerous aquatic species, including duckweeds, waterweeds (Elodea), pondweed, bladderworts, mermaid-weed, bur-reeds, water shield, and, among the most attractive, yellow pond lilies and white water lilies.

The north end of the pond appears to support some unique plant life including a rare species of beak-rush and black ash and black gum trees (both of which are uncommon in this area of the state). Also observed here is a recently formed peat bog supporting typical bog plants like cranberry, leather leaf, and azaleas.

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<sup>13</sup> Massachusetts Division of Fisheries and Wildlife website: <http://www.mass.gov/eca/agencies/dfg/dfw/wildlife-habitat-conservation/coldwater-fish-resources-map.html>. Accessed December 30, 2016.

While Leverett Pond is one of the town's signature natural resources, it is compromised by the presence of the inadvertently introduced invasive species Eurasian and Variable Milfoil. Eurasian and Variable Milfoil are the main targets of recent aquatic weed control efforts. Curly Leaf Pondweed, Large Leaf Pondweed, and Swollen and Purple Bladderwort have also been targets of recent management programs due to recent outbreaks. Pond management is undertaken by the Friends of Leverett Pond, a group of neighbors and other interested citizens who want to maintain the high quality of the pond. This group has received funding from the Massachusetts Department of Environmental Management to manage nuisance exotic plant species.

Controlling Eurasian and Variable Milfoil involves application of the herbicide 2,4-D/ Triclopyr and Diquat plus selective hand-pulling. This herbicide was applied to less than two acres in 1994, 2001 and eight acres following 2011. Given the pond's value for fishing and recreational boating, efforts are also made to keep "navigation channels" open for boat access. Control measures have combined hydroraking to remove floating mats, applying Rodeo (glyphosate herbicide), and hand-pulling "nuisance species" such as white water lily and water shield. While these plants enhance the beauty of the pond (e.g., when lilies are in flower) as well as provide nursery habitat for fishes, their growth is invasive. Besides nuisance species control, Leverett Pond has problems with its beaver population. The beaver dam on top of an existing man-made dam at the pond's outlet has raised water levels of the pond and may be stressing the structural stability of the existing dam. A "beaver pipe" has been installed at the dam to maintain the water level at a safe elevation, consistent with the design of the existing man-made dam.

The Friends of Leverett Pond are currently working to replace the failing dam in order to ensure that the pond will be maintained and available for the enjoyment of future Leverett residents. A functional dam would also allow the FLP to lower water levels temporarily in an effort to manage nuisance species without the use of herbicides. The FLP is working with state agencies and the Conservation Commission to achieve this goal. Other plans for the pond include installation of camping areas around the pond, and improving infrastructure for swimming and boating.

### **D.3 Wetlands**

MassGIS's 2005 land use data identified 573 acres of wetlands in Leverett. Because of the town's rolling topography, most wetlands are connected by perennial or intermittent streams. Much of the rest is located along the shores of Leverett Pond. Isolated wetlands (not connected to surface waters) represent a small percentage of Leverett's wetland acreage, although they are quite numerous.

#### Wetland Types

At least eight types of wetlands may be found in Leverett:

1. Hemlock and white pine swamps (palustrine evergreen forested wetlands)
2. Red maple swamps (palustrine deciduous forested wetlands)
3. Deciduous shrub swamps (palustrine deciduous scrub-shrub wetlands)

4. Shrub bogs (palustrine evergreen scrub-shrub wetlands)
5. Wet meadows (palustrine emergent wetlands with a saturated water regime)
6. Marshes (palustrine emergent wetlands with a seasonally flooded to semi permanently flooded water regime)
7. Aquatic beds (lacustrine aquatic beds of floating-leaved and submerged plants)
8. Vernal pools

Forested wetlands and shrub swamps are dominated by woody species. Besides the major species listed above (hemlock, white pine, red maple), forested wetlands may include several other trees (yellow birch, gray birch, green ash, and swamp white oak), a few shrubs (spicebush, high-bush blueberry, shadbush, and chokeberry), and some herbaceous plants including cinnamon fern, royal fern, skunk cabbage (most evident in spring and early summer), and tussock sedge.

Shrub swamps are represented by common winterberry, swamp rose, silky dogwood, northern arrow-wood, speckled alder, willows, poison sumac, common elderberry, and buttonbush. The latter two species may occupy large areas.

Shrub bogs formed on a substrate of peat moss contain several species including cranberries, leatherleaf, blueberries, sheep laurel, azaleas, sundews, northern pitcher plant, and a few orchid species. Herbaceous (non-woody) plants characterize wet meadows, marshes, and aquatic beds.

Mowed and/or grazed pastures with high seasonal water tables throughout most of the year are called wet meadows. Their wetness results largely from groundwater seepage. Typical meadow species include tussock sedge, other sedges, soft rush, marsh fern, swamp milkweed, boneset, Joe-Pye weed, purple loosestrife, sensitive fern, and marsh marigold. Some meadows may have peat mosses.

Marshes occur in depressions or along the shores of Leverett Pond. Common marsh plants include broad-leaved cattail and water-willow, with less common species like pickerelweed, arrowhead, and smartweeds.

Aquatic beds consist mainly of white water lilies (most evident in summer mornings), yellow pond lily, bladderworts, and pondweeds. Eurasian and Variable Milfoil, Bladderwort And Curly-Leaf Pondweed have been a problem in Leverett Pond and the focus of intensive management (control) efforts over the past few years.

#### **D.4 Vernal Pools**

Vernal pools are typically seasonal ponds surrounded by woodlands. They are depressions that hold water from winter through mid-summer. Some may contain plants such as blue flag iris, buttonbush, and clumps of high-bush blueberry on raised mounds. They are vital breeding grounds for several amphibians including salamanders (bluespotted, spotted, and marbled), frogs (spring peeper, wood frog, and gray tree frog), and the American toad. According to the Massachusetts Natural Heritage and Endangered Species Program (NHESP), the Town of Leverett has 21 Certified and 69 Potential Vernal Pools.

## **D.5 Beaver Dams**

Beaver activity has been increasing over the past decade. Several wetland areas have been flooded by beaver dam construction. As a result, their vegetation has changed from forested wetland to marshy habitat. Sometimes beaver activity is detrimental to property, causing problems for local landowners (e.g., flooding of wells, septic systems, lawns, out-buildings, and roadways). Affected individuals must contact the Board of Health and Conservation Commission for advice and permission to alleviate beaver problems.

## **D.6 Aquifers**

Water plays a very important role in supporting our communities. We use water every day for drinking, for disposal of our sewage, for irrigating croplands and lawns and for our local industries. The amount of money we, as individuals, pay for our clean drinking water depends on its supply and the amount of effort that is invested in purifying it. Surface reservoirs often require expensive filtration plants that are monitored regularly by paid professionals. In comparison, aquifers contain water that enters the soils within a sub-watershed as precipitation and which slowly infiltrates the ground water levels. This slow infiltration process helps to purify the water at little cost to the consumer. This is one way in which watersheds in their natural, vegetated state provide a valuable ecological service. Land naturally contributes to the hydrologic cycle by storing and releasing water. However, the manner in which we use land can hinder this ecological process by preventing water from infiltrating topsoil or by allowing contaminated water to leach into the groundwater. Protected open space can help preserve the integrity of aquifers by sustaining the land's natural water retention capacity and by reducing the areas covered by land uses that store, use, or distribute hazardous materials.

Leverett's groundwater supply is produced mainly from aquifers associated with four major drainages: the Sawmill River, Long Plain Brook, Doolittle Brook, and Roaring Brook. These basins cover about one-fourth of the town's land area and have the best potential for producing public water supplies in the future. In particular, the Long Plain Aquifer that extends into Sunderland is the largest producer of public water for that town. These four aquifer drainages are classified as aquifer protection districts. The town's zoning bylaw limits development in these areas.

Non-point source pollution in Leverett can also impact drinking water. There is a direct link between above ground land use and below ground water quality. For example, lawns actually facilitate the movement of rainwater across the ground's surface instead of providing an easy entry point to the soil. Pavement produces even more runoff because it is impervious. Normally, as a community grows the amount of impervious surfaces increases. When precipitation runs off a surface like asphalt, the rainwater may pick up and carry contaminants into streams, ponds, lakes, and into the groundwater. Some of the groundwater moves through subsurface soil layers into streams, while other seeps down into aquifers. The town could benefit from an effort to try to minimize the amount of impervious cover and find ways of diverting storm water runoff to retention areas so sediments and highway related pollutants can settle out before being transported to surface and ground waters. New subdivision regulations and

standards for development could encourage the use of Low Impact Development (LID) techniques in new developments and when property owners retrofit buildings or redevelop parking areas or driveway configurations.

## **D.7 Flood Hazard Areas**

Water levels in Leverett's rivers, streams, and wetlands rise and fall seasonally and during high rainfall events. High water levels are typical in spring, due to snowmelt and ground thaw. This is the period when flood hazards are normally expected. Low water levels occur in summer due to high evaporation and plant uptake (transpiration). At any time, heavy rainfall may create conditions that raise water levels in rivers and streams above bank full stage causing them to overflow adjacent lands.

Flood hazard areas include the watercourses (rivers and streams) and adjacent relatively low-lying areas subject to periodic flooding (the 100-year flood zone and 500-year flood zone). The 100-year floodplain has a one percent chance of being flooded in a single year, while areas in the 500-year floodplain have a 0.2% chance of being flooded in any given year.

Most of the flood hazard areas in Leverett are narrow, fewer than 400 feet wide, because the town's hilly topography and rocky terrain do not permit the formation of broad floodplains. Leverett's floodplains are corridors that pass flowing water downstream, eventually into the Connecticut River. In Leverett, the 100-year flood zone covers mostly narrow bands of level floodplain land along the Doolittle Brook, Long Plain Brook, the Sawmill River, and the section of Roaring Brook west of Cushman Road. In several areas, the flood zone widens out to encompass farmland, residential land, commercial land, and industrial land. The 100-year floodplain covers about 349 acres, or approximately 2.4 percent of the town, including an estimated 9 acres of developed residential land.<sup>14</sup>

FEMA maps used by the National Flood Insurance Program (NFIP) identify flood hazard areas across America. The following areas have been designated as flood hazard areas in Leverett on the Flood Rate Insurance Map (FIRM) dated June 4, 1980<sup>15</sup>:

- ❖ Sawmill River.
- ❖ The lower portion of an unnamed intermittent stream ("Cave Hill Run") running off Jackson Hill and Ingraham Hill, draining into wetlands along Montague Road and between this road and Long Plain Road (Route 63).
- ❖ Williams Brook along Richardson Road.
- ❖ An unnamed tributary ("Dudleyville Brook") to the Sawmill River along Dudleyville Road.
- ❖ Red Brook.
- ❖ Long Plain Brook.

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<sup>14</sup> 2005 MassGIS land use data.

<sup>15</sup> In November 2018, FEMA began a 5-7 year project called "Risk MAP" to digitally modernize the floodplain maps in Franklin County, including for the Town of Leverett, using LIDAR data and a watershed-oriented approach.

- ❖ An unnamed tributary (“Joshua Hill Run”) crossing Route 63 about three-fourths of a mile from its intersection with Long Hill Road, and two 500-year floodways (one crossing Route 63 and Depot Road and looping back to Route 63, the other crossing Bull Hill Road).
- ❖ Doolittle Brook (beginning about 800 feet south of Rattlesnake Gutter Road.
- ❖ Leverett Pond, its outlet stream, and an unnamed intermittent stream it connects with (“Dry Run”) which eventually joins Doolittle Brook.
- ❖ Roaring Brook (running westerly, beginning about one hundred feet just east of the crossing at Cushman Road.

According to the 2014 Leverett Hazard Mitigation Plan, the 2010 Leverett Comprehensive Emergency Management Plan identifies the following flood prone roadway areas in Leverett:

- ❖ East Leverett, Teawaddle Hill Road, and Cushman Pond Area
- ❖ Juggler Meadow Road
- ❖ Shutesbury Road at Broad Hill
- ❖ Leverett Pond Dam
- ❖ Dudleyville Road
- ❖ Richardson Road
- ❖ Coke Kiln Road
- ❖ North Leverett Road (in the event of a Lake Wyola Dam failure)
- ❖ Long Plain Brook at Route 63/Depot Road/Bull Hill Road

This last location, Long Plain Brook at Route 63/Depot Road/Bull Hill Road, has been identified as one of three areas in town of particular concern with repeated flooding events. Two others are located at the intersection of Route 63 and Montague Road and at the intersection of East Leverett Road and Teawaddle Hill Road.

Two major flooding events occurred in Leverett within five days of each other in June 1996. On June 8, heavy rain accompanied by thunderstorms caused the Sawmill River and Roaring Brook to overflow their banks, resulting in major flooding and road washouts. On June 13, thunderstorms with torrential downpours produced a flash flood, which resulted in the worst flooding in 100 years of records on the Sawmill River. The Spaulding Brook experienced its worst flooding in recent memory. All but one access road into Leverett was washed out and a bridge on the Sawmill River was washed away by the rushing water.

## **E. VEGETATION**

### **E.1 Forests**

Leverett is almost entirely covered by forest, which provides an abundance of timber, opportunities for recreation, wildlife habitat, the benefits of climate moderation, and the protection of water quality. MassGIS’s 2005 land use data identified 12,574 acres of forest in Leverett, covering over 85 percent of the town’s total land area. The forest and intermixed agricultural land also provide a visually pleasant landscape. Central hardwoods and transition

hardwood forests cover the ridges. The dominant forest types present in the Worcester Plateau Ecoregion are transition hardwoods and some northern hardwoods. NHESP has identified Sugar Maple-Oak-Hickory Forest as one of the two Priority Natural Communities (PNC) located in Leverett. The second PNC is a Calcareous Rock Cliff Community. These are sparsely vegetated areas that include specialized plants that grow in cracks and ledges in calcium-rich cliff faces. Surrounding forest often includes sugar maple, white ash, basswood, butternut, and black and yellow birches. (See *BioMap2 Report for Leverett for maps and information on these natural communities*. [http://maps.massgis.state.ma.us/dfg/biomap/pdf/town\\_core/Leverett.pdf](http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Leverett.pdf))

The town's forests are mainly closed-canopied and middle-aged, having a great diversity of species, but little diversity of horizontal or vertical structure. Most of today's forests originate from the indiscriminate cutting of "old field" white pine for box lumber early in this century. The "old field" white pine stands developed on former agricultural land that was abandoned in the mid to late 1800s. Prior to their abandonment, small subsistence farms accounted for two thirds of the town's open land.

The town's forests, like all forests in southern New England, have been subjected to a number of disturbances in the past century and before colonial settlement. Hurricanes have always been a factor in the development of southern New England's forests. The hurricane of 1938, for example, inflicted severe damage. While no quantitative records exist of the acreage in Leverett affected by that storm, the records of the Northeast Timber Salvage Administration show that 1.8 million board feet of logs were stored in Leverett Pond and 1.5 million board feet in Cranberry Pond to protect them from insects and fungal stain before they could be transformed into lumber. Collectively, this amount is equivalent to more than one thousand present-day truckloads! Today, when the summer water temperature rises, remnant logs from the 1938 storage effort still rise to the surface. Many of these log ends are stamped "US." While one would expect that not all the logs were salvaged in Leverett, it does give one a sense of the storm's severity in the region. It is reasonable to speculate that only the most valuable trees of those blown down were salvaged because of the abundance of downed timber.

The probabilities of a storm of this magnitude occurring again are quite high. Historians believe that there have been four other hurricanes since 1600 (1635, 1638, 1815, and 1869) that were as severe. In Massachusetts, major hurricanes occurred in 1904, 1938, 1954, 1955, 1960, 1976, 1985, and 1991. The last hurricane to make landfall in New England was Hurricane Bob, a weak category 2 hurricane, in August 1991. Tropical Storm Irene, which hit New England on August 27-29, 2011, did not qualify as a hurricane, but nevertheless had a significant negative impact on Berkshire, Franklin, Hampden, Hampshire, Norfolk, Bristol, Plymouth, Barnstable, Martha's Vineyard, and Nantucket Counties and causing over \$25 million in property damage.

Other meteorological events that have affected the town's forests are localized microbursts, thunderstorms, and occasional tornadoes. According to data supplied by the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center, between July 1997 and June 2013, Leverett experienced five microburst (or "thunderstorm wind") events. Four out of five of these events caused property damages ranging from \$10,000 to \$15,000, largely resulting from downed trees and power lines. On May 26, 2010, strong thunderstorm winds caused damages throughout the Connecticut River Valley with numerous trees and wires down



and widespread power outages. The storm resulted in a total of \$15,000 in damages in Leverett. There have been two tornadoes that have touched down in Leverett, one in August 1972 and one in 1980 that damaged land along Cave Hill Rd. Both were ranked F1 (Moderate Tornado) on the Fujita Scale of Tornado Intensity. While the area affected by each event is small, the cumulative effect is significant.

Major ice storms, such as the one in January 1998 that missed Leverett, but devastated communities further north, also have significant effects on forests. Fortunately, southern New England escaped the devastating effects of the storm that hit a 17-million-acre belt across northern New England, where power lines were down for weeks and entire forests were destroyed. Nonetheless, some residents in Leverett were without power for 3 to 9 days. On December 11, 2008, Franklin County residents awoke to a landscape coated with ice. This major ice storm affected interior Massachusetts and southern New Hampshire as well as much of northern New England. The ice buildup on exposed surfaces combined with breezy conditions resulted in numerous downed trees, branches, and power lines, which resulted in widespread power outages. The ice storm did not impact Leverett as severely as other Franklin County towns, though fourteen people lost power in the Dudleyville section of town. At the end of October 2011, a severe snowstorm hit Berkshire, Franklin, Hampden, Hampshire, Middlesex, and Worcester Counties. Known as “Snowtober,” the storm’s extensive damage resulted in a Presidential Disaster Declaration.

Species with weak wood such as birches, red maple, and aspen are more easily damaged by ice and wet snow. Species with greater structural integrity such as oaks and sugar maple benefit from the reduced competition in affected stands and move ahead in the race for light to assume dominance. Trees of any species that are structurally weak due to acute branching angles, forks, and crooks, and those that are shallow-rooted, are also more susceptible to wind and ice damage. Eastern white pine, often a multi-stemmed tree from repeated white pine weevil damage, suffers a disproportionate amount of damage from ice storms and wet snow.

Wind, ice, and snow can cause considerable economic damage to a forest. However, from an ecological perspective, a tree’s misfortune often has a positive outcome for other organisms. Large broken limbs and other wounds create cavities in trees that are utilized by over fifty species of mammals and birds. These events can produce greater vertical structural diversity in a forest by creating small openings in which shrubs and smaller trees can develop. Drought also shapes forest composition but in a more subtle fashion. A drought in the summer of 2001 caused many marginal trees on exposed, dry sites to succumb to moisture stress. Western Massachusetts experienced another drought in 2016, and more extreme temperatures are expected to cause more frequent droughts in the future. A more drought-resistant community of trees will most likely replace the dead ones, and these species may become more common in the region as the climate shifts.

Insects and pathogens also have a profound influence on forests. Perhaps the most destructive event of that type in recent memory was the severe infestation by several defoliating insect species in the early 1980s. The most obvious insect was the gypsy moth, introduced from Eurasia into the US in 1869 in Medford, Massachusetts. The last major gypsy moth defoliations

in Leverett were in 1983 and 1984, although there was reportedly a significant infestation south of Leverett in 2017.

The gypsy moth defoliation was preceded by several years of activity by a less well-known insect complex known as the oak leaf tier/roller complex. These species are native to southern New England and until that event, little was known about them since they have not been known to occur in numbers great enough to do serious damage. The defoliation continued for several growing seasons with the most serious effects on south and west slopes, where oaks (their preferred food) predominate and trees are generally under more environmental stress. Although defoliation occurred nearly forty years ago, mortality continues in these stands as the weakened trees fall victim to secondary pathogens such as shoestring root rot (*Armillaria mellea*). Such events cause shifts in the composition of plant communities. Generally speaking, preferred hosts such as the oaks and birches suffer disproportionately and are replaced or are reduced in numbers in relation to those species that are not as susceptible such as the maples. Some scientists feel that, over the last 150 years, some of the gypsy moth's natural enemies may have established themselves, either naturally or through deliberate introduction. This appears to have reduced the severity of major outbreaks compared to that of early years.

Human activities, such as clearing for agriculture in the immediate, post-European settlement era and the abandonment of these farms in the mid-nineteenth century, produced "old field" white pine stands that covered much of southern New England in the early part of the twentieth century. In the aftermath of harvesting these forests for box boards (corrugated cardboard was yet to be invented), rampant wildfires often burned up to 100,000 acres annually in the Commonwealth. An indifferent public allowed these fires to reach great size; inadequacy of fire-suppression techniques was another factor. Another major cause of forest fires were railroads whose locomotives spewed sparks along their rights of way. Since no trailer trucks existed in those days, almost all the products of the nation's burgeoning industrial economy moved to domestic and international markets by rail.

This period of large uncontrolled fires came to a close when the first state fire suppression forces were created in 1913. Laws were also enacted that required spark arrestors on locomotives and the railroads were held financially liable for damages and the costs of fire-extinguishing services. Today, public awareness of the adverse effects of wildfires has greatly reduced their frequency. Leverett has experienced seventeen wildfires since 2010, according to the Leverett Fire Department. On September 26 and 27, 2010, a brush fire near the base of Mount Toby just south of the intersection of Route 63 and Long Hill Road spread over one to two acres and required 16 fire departments from Franklin and Hampshire County to extinguish. Wind and drought conditions contributed to the spread of the fire.<sup>16</sup> Aerial sightings or early detection by the Mt. Toby tower, which is staffed by DCR during brush fire season, has enabled the Leverett Fire Department, assisted by the Shutesbury Fire Department and other communities' departments through the mutual aid program and the state's Bureau of Forest Fire Control, to quickly bring fires under control. Today, we take for granted this small number of wildfires, but we can safely assume that less than a hundred years ago, hundreds of acres of forest land burned, uncontrolled, each year in the town.

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<sup>16</sup> *The Recorder*, September 28, 2010.

The second highest natural resource goal in the *Franklin County 2035 Regional Plan for Sustainable Development (RPSD)* is to protect forests. Unfragmented forests, old-growth forests, and forests that support rare and endangered plant and animal species are especially valuable. Forests along rivers and streams are also a priority to protect for their important habitat, water recharge functions, and bank stabilization. Forests located on soils good for timber production should also be protected. The plan lists several potential impacts on forests due to climate change, including decline of maple syrup production, the deterioration of the Eastern Hemlock, and the spread of invasive species.

Sustainable forestry practices that strike a balance between environmental protection and economic development also provide employment, support rural communities, and encourage landowners to retain their woodlots rather than selling them. Benefits of management for a healthy forest include providing a sustainable source of wood products, increasing the diversity of habitats for wildlife, and offering places for recreation.

A mixture of different patches of forest generally provides a range of habitats, supports more wildlife species, and increases the resiliency and responsiveness of our forests.<sup>17</sup> Bird species requiring scrub or early successional forests are getting scarcer. Harvesting mature forest may be necessary to increase the habitat for these species beyond the areas under high tension lines. Insect, disease and storm damage to the forest can also be decreased through timber harvesting (one reason Quabbin forests have been cut). The decline in early successional forests and habitat may be a result of the suppression of natural disturbances (including beavers, fire, etc.) Forestry management best practices also emphasize the value of emulating old-growth conditions<sup>18</sup> and limiting the fragmentation of forests to protect wildlife habitat.

Most of Leverett's managed forest land is owned and managed by W. D. Cows, Inc.; the balance of harvesting in town takes place on tracts owned by private individuals. These products fuel a timber economy that supports the "buy local" movement in the Pioneer Valley. Forests are dynamic plant communities that experience both "natural" and human-caused disturbances or stresses that have shaped, and will continue to shape, their development over time.

## **E.2 Public Shade Trees**

Leverett is fortunate to have many roads that are bordered by a profusion of shade trees. These trees promote both environmental quality and quality of life for residents. The many benefits of street trees include improved air quality; reduced flooding and improved water quality as trees intercept rain through their leaves and branches and absorb water through their roots; higher property values for neighboring homes; slower traffic speeds and less traffic noise; and cooler temperatures in the summer which can extend the pavement life of the street. Street trees in more heavily developed areas also provide a pleasant environment for pedestrians to walk, thereby encouraging recreation and visitors and shoppers to spend time in a downtown.

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<sup>17</sup> Millar et al 2007.

<sup>18</sup> (Rankin and Perlut 2015).

It is easy for residents to take such beauty for granted, but close examination of many of these trees suggests that the town needs to be more attentive. The maple trees on Amherst Rd, once impressive, are now mostly dead or dying. Recently, 40 trees have been marked for removal on Shutesbury Hill Road. Many trees are suffering from a number of adverse environmental influences: insects, de-icing chemicals, air pollution, root damage, utility maintenance, and over-maturity. Leverett has accepted the "Scenic Roads Act," which provides protection for trees within the right-of-way of all town roads. However, the act by itself does not guarantee the continued presence of these trees. Removing hazardous trees and thinning young stands to promote the development of vigorous trees would accomplish the purpose of the act. Leverett must adopt an active shade tree management program if its residents are to continue to enjoy this valuable resource. This program would include an initial inventory of existing public shade trees, along with a plan for planting replacement trees for those that die or are removed from key locations.

The benefits of street trees include the following:<sup>19</sup>

- ❖ Air quality improvement
- ❖ Water quality improvement (incl. improved stormwater management)
- ❖ Cooler air temperatures
- ❖ Greenhouse gas reduction
- ❖ Building energy conservation
- ❖ Noise reduction
- ❖ Wildlife habitat
- ❖ Social/psychological benefits
- ❖ Human health benefits
- ❖ Aesthetics

The USDA Forest Service has created a state-of-the-art, peer-reviewed software suite that provides urban and rural forestry analysis and benefits assessment tools, called **i-Tree**.<sup>20</sup> The **i-Tree** tools can help strengthen forest management and advocacy efforts by quantifying forest structure and the environmental benefits that trees provide. Since the initial release of the **i-Tree** Tools in August 2006, thousands of communities, non-profit organizations, consultants, volunteers and students around the world have used **i-Tree** to report on individual trees, parcels, neighborhoods, cities, and even entire states. By understanding the local, tangible ecosystem services that trees provide, **i-Tree** users can link forest management activities with environmental quality and community livability. Analysis tools and utility programs include:

- ❖ **i-Tree Eco**, which provides a broad picture of the entire urban or rural forest;
- ❖ **i-Tree Hydro**, an application designed to simulate the effects of changes in tree and other land cover characteristics within a watershed on stream flow and water quality;
- ❖ **i-Tree Species**, a web application designed to help urban foresters select the most appropriate tree species based on environmental function and geographic area;
- ❖ **i-Tree Streets**, focusing on the benefits provided by a municipality's street trees;

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<sup>19</sup> Rick W. Harper, Ext. Assist. Professor-Urban and Community Forestry, UMass, "Realizing the Benefits of our Urban Trees," *3rd Annual Massachusetts Clean Energy Conference: Helping Communities with Renewables and Efficiency*; 2016.

<sup>20</sup> <http://www.itreetools.org/>

- ❖ **i-Tree Pest Detection Module**, a portable, accessible and standardized protocol for observing a tree for possible insect or disease problems; and
- ❖ **i-Tree Storm**, a method for a community to assess widespread storm damage in a simple, credible, and efficient manner immediately after a severe storm.

The Franklin Regional Council of Governments has also compiled a list of Climate Resilient Trees for Streetside Tree Belt Planting, including both shade and ornamental trees. The list provides information on the characteristics of 28 species of trees, including height and spread of the mature tree, whether it is native to North America, the USDA grow zone, light and watering requirements. In addition, the list indicates whether each species is tolerant to drought, salt, air pollution and clay soils; whether it has showy fall foliage or flowers; and whether it is appropriate to plant under utility lines. (See Appendix B for the list of Climate Resilient Trees for Streetside Tree Belt Planting.)

### E.3 Rare and Endangered Plant Species

Rare and endangered plants listed by the Division of Fisheries and Wildlife as being located in Leverett include:

**Table 4-2: Plant Species in Leverett Listed as Special Concern, Threatened, or Endangered**

Scientific Name	Common Name	MESA Status*	Most Recent Observation
<i>Ophioglossum pusillum</i>	Adder's-tongue Fern	T	1934
<i>Trichomanes intricatum</i>	Appalachian Bristle-fern	E	2010
<i>Carex baileyi</i>	Bailey's Sedge	T	
<i>Adlumia fungosa</i>	Climbing Fumitory	SC	1999
<i>Myriophyllum verticillatum</i>	Comb Water-milfoil	E	Historic
<i>Symphotrichum prenanthoides</i>	Crooked-stem Aster	SC	1915
<i>Arceuthobium pusillum</i>	Dwarf Mistletoe	SC	2014
<i>Rhododendron maximum</i>	Great Laurel	T	2002
<i>Boechera missouriensis</i>	Green Rock-cress	T	1891
<i>Clematis occidentalis</i>	Purple Clematis	SC	1999
<i>Asclepias purpurascens</i>	Purple Milkweed	E	1932
<i>Sphenopholis nitida</i>	Shining Wedgegrass	T	1999
<i>Sphenopholis pennsylvanica</i>	Swamp Oats	T	1999
<i>Asplenium ruta-muraria</i>	Wall-rue Spleenwort	T	

\*SC – Special Concern; T - Threatened; E – Endangered.

**Source:** Letter from Lynn C. Harper, NHESP Habitat Protection Specialist, dated July 10, 2017; Massachusetts NHESP, Town Species Viewer: <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/town-species-viewer.html>.

The land in and adjacent to Mount Toby State Forest supports one of the state’s most viable populations of Autumn Coralroot (*Corallorhiza odontorhiza*), a small orchid.

## **E.4 Aquatic Vegetation**

The vegetative covers of wetlands, riverine, and lake/pond areas in Leverett are typical of wetlands and water bodies in western Massachusetts. As noted above, the area around Leverett Pond includes sixty-two acres of emergent and aquatic bed vegetation, and eight acres of shrub swamp. The pond is currently infested with Swollen Bladderwort (often mistaken for Common Bladderwort), and much more aggressive, and Purple Bladderwort. In 2018 bladderwort overtook milfoil as the dominant problem species in many open areas. These areas increase the overall biodiversity of the town and region by providing a great variety of important habitat types. The vegetation that lines these shores and grows in the water is important to the health of the water bodies. It also provides crucial habitat for edge species where water and land meet. This habitat is enhanced because the plants that grow there reduce bank erosion and keep the nutrient and oxygen levels of the water in balance.

## **F. FISHERIES AND WILDLIFE**

The existence and abundance of wildlife species are dependent on habitat; as habitats change through natural succession, or by human activities, local animal populations fluctuate. In general, each seral stage of succession (the series of ecological communities that occur in a given area as species structure and natural community processes change with time) supports a particular array of wildlife.

Before the Northeast was colonized, native people cleared large areas and burned them annually to maintain tillable fields. When colonists subsequently occupied the region they cleared more land, expanding the open countryside. (Local populations of Native Americans in southern New England were nearly eliminated in the early 1700s by smallpox carried by colonists from Europe.) Much of southern New England at one time was nearly denuded of forests. It is thought that approximately three-quarters of western Massachusetts was deforested before 1800. By 1850 many fields were abandoned when farmers left to re-establish themselves in Ohio and adjacent states with more fertile and tillable soils. The fields were abandoned to nature and the natural succession of vegetation began. Within three decades the early stages of reforestation had commenced; at the turn of the century, mature forest dominated this area. Today we know that the early successional stages and grasslands important to many wildlife species have disappeared, and forest wildlife species are now dominant. Increased sightings in Leverett of moose, wild turkeys, coyotes, bobcats, bears, and fishers indicate that the forests are older; conversely, fewer sightings of cottontail rabbits, woodchucks, red fox, and woodcock indicate the scarcity of more open types of habitats.

The mixture of grassland, shrub land, wetland, and forest habitats in Leverett harbors at least 162 species of birds, 50 species of mammals, 25 species of amphibians, and 12 species of reptiles. Over one hundred bird species nest here. Many mammals, small and/or nocturnal, are not commonly seen. Unconfirmed sightings of a mountain lion have been made in recent years.



Leverett Pond and the town's major streams support a variety of fish along with the diverse aquatic invertebrates on which they feed. Native and stocked brook and rainbow trout live in the Sawmill River, Long Plain Brook, Roaring Brook and Doolittle Brook. Leverett Pond supports a healthy warm water fishery. Largemouth bass and sunfishes (pumpkinseed and bluegill) dominate, but pickerel, bullhead, black crappie, yellow perch, golden shiner, and American eel also thrive.

### **F.1 Corridors for Wildlife Migration**

Leverett is located within several regional belts of protected open space that contribute to the value of the already protected land in town. The Quabbin Reservoir Reservation is a particularly important source of wildlife for surrounding communities. The Quabbin Reservoir covers 39 square miles just to the east of Leverett. The town is also located just to the south of a chain of several state forests that create another belt of protected open space. This belt includes the Montague Wildlife Management Area, Wendell State Forest, Erving State Forest, Warwick State Forest, Northfield State Forest, and the Mt. Grace State Forest. These large contiguous areas of protected lands provide important corridors for wildlife migration, which will become increasingly critical as the effects of climate change continue to take place. Ensuring that there are no gaps to these corridors in Leverett can help bolster the resiliency of wildlife in the region and the state.

### **F.2 Core Habitats and Rare, Threatened or Endangered Species**

The National Heritage and Endangered Species Program recognizes five Core Habitat areas in Leverett. Core Habitats are habitats for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. The land in and adjacent to Mount Toby State Forest supports significant populations of Eastern Box Turtles and Jefferson Salamanders. Mourning Warblers nest in the shrubby power line corridors that transect Mount Toby. There are populations of Wood and Spotted Turtles in Long Plain Brook and Doolittle Brook. Small wetlands and the headwaters of Doolittle Brook along the western base of Joshua Hill are home to Marbled and Four-toed Salamanders. (*See BioMap2 Report for Leverett for*

maps and information on these natural communities.

[http://maps.massgis.state.ma.us/dfg/biomap/pdf/town\\_core/Leverett.pdf](http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Leverett.pdf))

**Table 4-3: Wildlife Species in Leverett Listed as Special Concern, Threatened, or Endangered**

Taxonomic Group	Scientific Name	Common Name	MESA Status	Most Recent Observation
Fish	<i>Catostomus catostomus</i> ,	Longnose Sucker	SC	
Fish	<i>Notropis bifrenatus</i>	Bridle Shiner	SC	2004
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle	SC	2017
Reptile	<i>Terrapene carolina</i>	Eastern Box Turtle	SC	2010
Bird	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	T	1970s
Bird	<i>Falco peregrinus</i>	Peregrine Falcon	T	1932
Amphibian	<i>Ambystoma jeffersonianum</i>	Jefferson Salamander	SC	1967
Amphibian	<i>Ambystoma opacum</i>	Marbled Salamander	T	2010

SC – Special Concern; T - Threatened; E – Endangered.

**Source:** Letter from Lynn C. Harper, NHESP Habitat Protection Specialist, dated July 10, 2017; Massachusetts NHESP, Town Species Viewer: <http://www.mass.gov/cea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/town-species-viewer.html>.

As mentioned in the beginning of this section, 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. The *BioMap2* project and The Nature Conservancy’s resiliency mapping are two resources that can be consulted when working to prioritize conservation for species diversity and health. NHESP Priority Habitats for Rare and Endangered Species are shown on the Scenic Resources & Unique Environments Map at the end of this section. BioMap2 Core Habitat and Critical Natural Landscapes in Leverett can be viewed at [http://maps.massgis.state.ma.us/dfg/biomap/pdf/town\\_core/Leverett.pdf](http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Leverett.pdf).

## G. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

This section identifies the scenic resources and unique environments that most Leverett residents would agree represent the essence of Leverett’s character. The purpose for inventorying the scenic resources and unique natural environments in Leverett is to provide the basis for prioritizing resource protection efforts. For this reason the following section includes information about the different values associated with each scenic resource and natural environment and identifies areas where there are multiple values represented in one landscape.



Those landscapes that contain, for example, scenic, wildlife, and cultural values may be seen as having a higher priority for protection than a landscape that contains only one value.

Though its overall landscape is similar to that of neighboring towns, Leverett has many special places that offer residents enjoyment and a sense of place. These areas have scenic, cultural, and ecological or wildlife values, are on public or private land, and may or may not have some level of protection.



**Wood turtle observed in Leverett in 2017**

Cultural and historical resources include sites dating from the colonial period (significant variety of mill sites) to the nineteenth century (churches, Town Hall, the town pound, lead mines, and sugar houses), the Revolutionary War (lead mines) and early colonial period (old streamside mill sites, the town pound) to more recent structures (churches, Town Hall, sugar houses). Scenic roads and trails provide access to woods, meadows, streams, and hillside views. Such resources include major and minor trails such as the Robert Frost Trail, Mt. Toby trails, the town-wide trails network maintained by the Leverett Trails Committee, as well as numerous old roads and logging trails. Stream corridors, wetlands, and Leverett Pond are natural areas that provide both scenic and wildlife values. Unusual natural communities and geologic features include bogs, grasslands, and Leverett’s Rattlesnake Gutter.

In 2009, the Town of Leverett, with the assistance of the Massachusetts Department of Conservation and Recreation, the Franklin Regional Council of Governments, and the Pioneer Valley Planning Commission, completed a heritage landscape inventory reconnaissance report. The report documents the “special places created by human interaction with the natural environment that help define the character of a community and reflect its past.” Residents and town officials participated in identifying six heritage landscapes in town:

- ❖ Leverett Town Center;
- ❖ Sawmill River Corridor;
- ❖ Peace Pagoda and Poor Farm (including Cave Hill Conservation Area);
- ❖ Roaring Brook Corridor;
- ❖ Mitchell Farm (Teawaddle Hill Farm); and
- ❖ Brushy Mountain historic house and farm sites.

The report notes opportunities, issues, and recommendations for how to protect and preserve each heritage landscape.

Table 4-4 lists the different landscapes from past inventories based on their location and describes their scenic, natural/ecological, and cultural/historical values, and whether the

landscape falls within one of the heritage landscapes identified in 2009. The numbers in Table 4-4 correlate with the Scenic Resources and Unique Environments map, showing the location of each scenic landscape feature in Leverett.

Table 4-4 also shows the landscape's estimated protection status. For the purposes of this Open Space and Recreation Plan, a landscape is defined as a land area with a particular land use pattern (farmland), or a physiological landform (monadnock) distinguishable from adjoining areas. Often ownership patterns do not coincide with the boundaries of a landscape. A ridgeline may have portions of it protected while the rest is in unprotected. Landscapes that contain parcels in the Ch. 61, 61A, or 61B programs are important because the town has the right of first refusal to purchase these properties. This right may be passed onto a third party, such as a conservation land trust. It is important to note, however, that properties in the Ch. 61, 61A, or 61B programs are not considered to be permanently protected, as they can be converted to another use if a town chooses not to exercise its right of first refusal and back taxes are paid.

**Table 4-4: Significant Scenic/Historic/Natural Landscapes/Environments in Leverett**

Map #	Location of Landscape	Landscape w/Significant Scenic Value	Landscape w/Significant Natural/Ecological Value	Landscape w/Significant Cultural/ Historical Value	Protection Status	2009 Heritage Landscape
<b>HISTORICAL SITES</b>						
H1	Charcoal Kiln			Historic—few such kilns left in New England		Sawmill River Corridor—Industrial
H2	First Congregational Church			Historic—1838 church built on site of original Meeting House		Town Center—Civic
H3	North Leverett Baptist Church			Historic—1835 church resulted from tax revolt by Baptists		
H4	Moore's Corner Church			Historic—1896 church was community project.		Sawmill River Corridor—Institutional
H5	Lead Mines			Historic—date mid 1800s		
H6	Leverett Crafts and Arts, Inc.			Historic/Cultural—former Beaman & Marvel Box Shop, now a widely known craft center	Has a preservation restriction	Town Center—Civic/Commercial
H7	Historic Mill Sites			Historic/Industrial	North Leverett Sawmill has preservation restriction	Sawmill River Corridor—Industrial East Leverett Mill Sites/Roaring Brook Corridor—Industrial
H8	Old Leverett Center Schoolhouse			Historic/Institutional		Town Center—Civic
H9	Old East Leverett Schoolhouse			Historic/Institutional		Roaring Brook Corridor—Civic
H10	North Leverett Schoolhouse			Historic/Institutional	Remodeled into the North Leverett Baptist Church Parish Hall	
H11	Old Moore's Corner Schoolhouse			Historic/Institutional	Owned by Leverett Historical Society	
H12	Slab-roofed Stone Chamber	X		Historic/Cultural	Has a preservation restriction	
H13	Glazier Sugar House			Historic—former Glazier sugarhouse on Rattlesnake Gutter Road depicted on Leverett Town Seal		
H14	Field Sugar House			Historic/Agricultural		
H15	Town Hall			Historic/Cultural—remodeled in 1895		Town Center—Civic

Map #	Location of Landscape	Landscape w/Significant Scenic Value	Landscape w/Significant Natural/Ecological Value	Landscape w/Significant Cultural/ Historical Value	Protection Status	2009 Heritage Landscape
H16	Town Pound			Historic/Cultural-early 1800s		Town Center-Civic
H17	Field Family Museum		X			
<b>NATURAL RESOURCE AND RECREATION SITES</b>						
R1	Dudley Brook Bog		X			
R2	Kettle Hole Pond	X	X		CR: Mass Fish & Wildlife	
R3	Leverett Pond	X	X Fishing, boating, bird watching, and swimming.			Town Center-Scenic/Recreational
R4	Mt. Toby Waterfall	X	X			
R5	Sawmill River Scenic Area	X	X Fishing/wading			Sawmill River Corridor-Scenic/Recreational
R6	Sawmill River Waterfall	X	X			Sawmill River Corridor-Scenic/Recreational
R7	Paul C. Jones Working Forest				CR	
R8	Rattlesnake Gutter					
R9	Robert Frost Trail					
R10	Trails Maintained by the Leverett Trails Committee					
R11	Mosher Shelter				RGT owned	
<b>OTHER SIGNIFICANT COMMUNITY SITES</b>						
C1	Leverett Coop					
C2	Leverett Post Office					
C3	Public Safety Complex					
C4	Elementary School					
C5	Leverett Library					
C6	Peace Pagoda			X		Peace Pagoda and Poor Farm-Institutional

## **H. ENVIRONMENTAL CHALLENGES**

### **H.1 Non-Point Source Pollution and Impaired Water Bodies**

Every stream, brook, and river in Leverett continues to be threatened by non-point source pollution from residential and agricultural runoff; from sedimentation; and particularly, from road salt washing into the town's wetlands and waterways. There have been occasional and isolated instances of road salt contamination of private wells. Town officials working with the homeowner on a case-by-case basis have solved these problems. The water supply for all of Leverett's homes is provided by private wells or springs. Some of the older wells are shallow but continue to function satisfactorily. In some areas of town, deep wells (depths exceeding five hundred feet) are required for an adequate source of water. Up-to-date and effective regulations for new construction are necessary to assure that every household has an uncontaminated water supply in the future.

Perhaps a greater challenge, however, is reducing the amount of road salt that is washed to wetlands. Roads in Leverett lack curbs, and generally slope down toward low-lying, wetland areas. There is no road sand or salt reclamation process for the town, and what does not remain on the streets washes into the adjacent lands. It would be in the interest of the town to conduct a study to determine what amount of sand and salt are being deposited into wetland resource areas, and to compare that against the salinity thresholds for the various plant and animal species present.

Low Impact Development (LID) is a group of land use development techniques that capture water and rainfall on site, filter it through vegetation and let it soak into the ground before entering the water table. Benefits include improved water quality, reduced flooding, and potentially lower construction costs than a conventional stormwater management system. The town should consider incorporating Low Impact Development (LID) techniques into town land use regulations, and implementing LID as part of town projects when feasible, as a means of addressing non-point sources of pollution affecting both natural resources and private property.

Leverett Pond has been listed as a Category 4a by the Massachusetts 2016 Integrated List of Waters and has an established Total Maximum Daily Load (TMDL). It is listed for the presence of Nutrient/Eutrophication Biological Indicators.

### **H.2 Invasive Species**

As discussed above, the introduction and spread of invasive nuisance plants has created a problem in Leverett Pond. Currently, the town is engaged in an ongoing management plan for the pond, spearheaded by the Friends of Leverett Pond and the Select Board. Experimenting with various measures, the Friends group has focused on controlling the spread of Eurasian and Variable milfoil and clearing other aquatic plants to maintain small navigational channels for boats. Efforts to maintain water level have been undertaken by installing a beaver pipe at the old dam where beavers are currently active.

In the updated management plan, mitigation measures to remove this invasive and increase recreational use of the pond include the use of the chemical 2,4-D/Triclopyr and Diquat followed by the use of hydro-rake to remove the treated plant matter.

Leverett's woodlands have begun to suffer from invasive non-native plants—which can outcompete the native vegetation and interrupt natural succession if they escape into natural areas to reproduce. The species presently seen in the woods and wetlands are barberry, multiflora rose, burning bush euonymus, Norway maple, Japanese (and other) honeysuckle, Asiatic bittersweet, Japanese knotweed, buckthorn, phragmites, garlic mustard, and purple loosestrife. The invasions of autumn olive and Russian olive frequently seen in the highway right-of-way in the Pioneer Valley are not yet such a problem in Leverett. Most of the above-named plants, as pure stands, do not have the same wildlife habitat or timber value as the indigenous plant species. Other pests include the beech fungus which has rendered a once economically important species almost useless, and the Emerald Ash Borer, which will be here soon, if not already.

Hemlock pests may have significant consequences for Leverett'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 arrived into the Springfield area from Connecticut in the early 1990s. Since then, it has extended its range north to Amherst and Northampton, and the limit of its cold hardiness is likely to be farther north than Leverett, where it is now found. Another threat to the hemlocks has been the hemlock looper, which has killed over 1,000 acres of hemlock in Franklin County.

### **H.3 Flooding, Erosion, and Sedimentation**

The 2014 Leverett Multi-Hazard Mitigation Plan identifies numerous areas in town where chronic flooding is an issue. Flooding in the hilly sections of town causes erosion and road washouts, while flooding in the flat area around the town center has caused property damage such as flooded basements. In addition to property and infrastructure damage from flooding, sediment from eroding banks can compromise habitat for fish and aquatic life, particularly during low flow conditions. Sedimentation also comes from road sand and loose soil in roadside swales. The plan 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.

### **H.4 Hazardous Waste, Brownfield Sites, Landfills**

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. Leverett has been working with the Franklin Regional Council of Governments and property owners to assess the extent of contamination and promote redevelopment of identified Brownfield sites in town. As of the end of 2017, one site in

Leverett—the Brown property at 95 North Leverett Road—had been assessed through the FRCOG Brownfields Program.

Another concern is hazardous materials leaching from the old town landfill, which affects the water supply of five homes in East Leverett. The former landfill has for generated a toxic plume that has seriously contaminated the drinking water of those homes. In 2019, The annual spring town meeting approved funding to allow the Select Board to investigate several options to deal with the situation. Those options include: connecting the homes to the Amherst water supply, drilling deeper wells into the bedrock below the plume, or taking the homes by eminent domain.

## H.5 Forestry Issues

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. 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.<sup>21</sup> 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.<sup>22</sup>

Challenges to practicing sustainable forestry in Leverett and the greater region include:

- ❖ A lack of local markets for low-grade wood, such as pellets and other products that could be made from small diameter trees, 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.

## H.6 Environmental Damage From Recreational Uses

Another challenge concerns the use of ATVs and especially Jeeps in protected wildlife and wetland resource areas. Recreational ATV use is not allowed on conservation areas owned by the Rattlesnake Gutter Trust, as well as in the Paul C. Jones Working Forest (owned by WD Cows, Inc.).

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<sup>21</sup> 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/](http://www.fs.usda.gov/ccrc/topics/forest-stewardship/).

<sup>22</sup> *Diameter Limit Cutting and Silviculture in Northeastern Forests: A Primer for Landowners, Practitioners, and Policy Makers*. USDA Forest Service, 2005; *What is Sustainable Forestry?* Peter J. Smallidge, NYS Extension Forester, Cornell Forestry Extension Program.

## **H.7 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. 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.

All town-owned recreational areas are free to enter and use. Furthermore, the Conservation Commission, the Rattlesnake Gutter Land Trust, and the Leverett Trails Committee have been actively working to expand the existing trails system throughout the town. Ultimately, the Trails Committee plans to create a town-wide loop. Community members also have plans to install an accessible walking path near the elementary school to facilitate outdoor recreation for persons of all ability levels.

According to MassGIS, there are no Environmental Justice populations identified in the Town of Leverett. That notwithstanding, there are concerns about water supply contamination, which resulted from leaching from the old town dump, that affects a small number of residents in certain areas. MassDEP is and has been managing that situation to meet their water quality standards for a long time.

Further, concern about the effects of the high cost of land and homes in Leverett has led the town to establish programs that provide grants to home buyers (who do not own any other homes at the time of closing) and down payment assistance, administered through the Franklin County Regional Housing & Redevelopment Authority (HRA) and using the town's Community Preservation Act funds. The Down Payment Assistance program offers a 0% interest loan on 5% of the purchase price of a home (costing no more than \$280,000) to all income eligible persons. The Mortgage Buy Down program uses a lottery system to offer grants of 20% on the sale price of a home (maximum grant of \$50,000; home sale price of no more than \$270,000) to eligible persons in exchange for a deed restriction mandating that the property remain permanently affordable. Since the first grant in 2014, four families have settled in Leverett through the Mortgage Buy Down program, thus protecting these four homes as affordable properties in perpetuity.

## **H.8 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. Between 2009 and 2016 (including the Great Recession) an average of three houses was built each year in Leverett, ranging from a low of one to a high of four per year. From 2012-2017, there have been very few house lots sold in Leverett and there are no subdivisions being planned. The town is anticipating a wave of new development in town as a result of the 2015 implementation of the LeverettNet Fiber-optic-To-The-Home (FTTH) high-speed internet network.



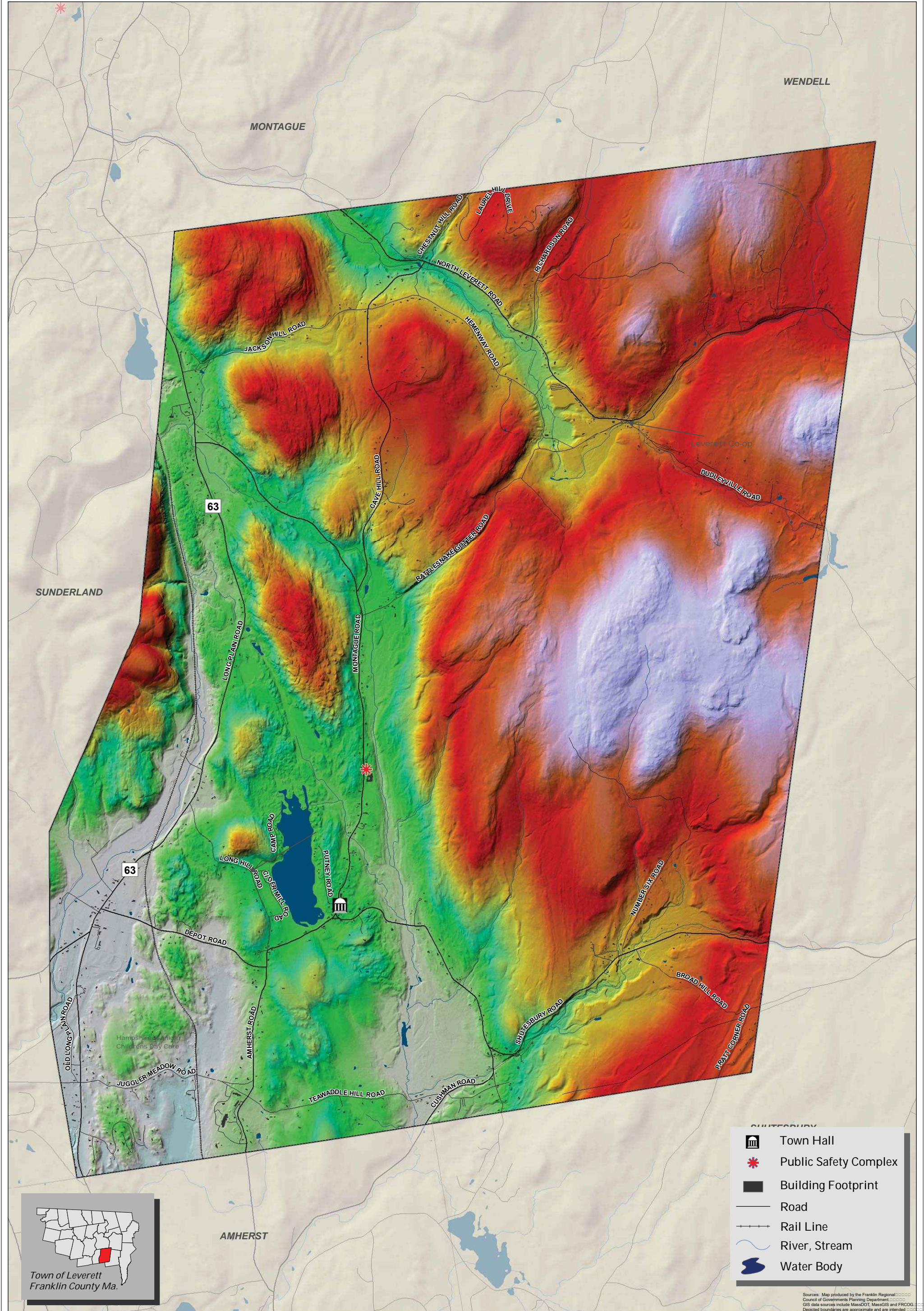
The overall character of Leverett could be affected by a number of potential changes. Potential impacts of climate change could begin to push populations further west in the State, away from the coast, and more of Leverett's land could be used for residential development. Diminishing supplies of fossil fuels – and their rising costs – continue to cause people to turn to alternate sources of locally produced energy sources, such as wood and solar, which could impact Leverett's woodlands and open spaces. Flooding 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 Leverett's existing character, and could lead to greater energy independence and food security.

According to the NHESP, there are three areas in Leverett that the town should consider protecting from development itself or encouraging conservation partners (MassWildlife, DCR, land trusts) to conserve:

- ❖ Unprotected land on Mt. Toby, along the Sunderland line
- ❖ Unprotected land on Joshua Hill, east of Route 63
- ❖ The *BioMap2* Forest Cores and adjacent unprotected areas along Diamond Match Ridge, in the northeast corner of the town, and on Brushy Mountain, into Shutesbury

These three areas support biodiversity resources of state-wide importance and should be protected from development. (See *BioMap2 Report for Leverett for maps and information on these natural communities*:

[http://maps.massgis.state.ma.us/dfg/biomap/pdf/town\\_core/Leverett.pdf](http://maps.massgis.state.ma.us/dfg/biomap/pdf/town_core/Leverett.pdf))



Town of Leverett  
Open Space &  
Recreation Plan 2018-2019

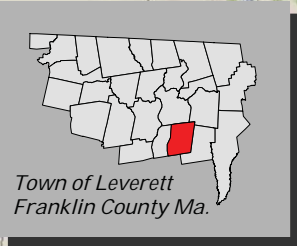
Leverett DEM\*  
(LiDAR derived)

\*Digital Elevation Model created using tiled  
LiDAR data collected 2015 UTM Zone 18N

0 0.25 0.5 1 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 approximate and are intended for planning purposes only, not to be used for survey.



Town of Leverett  
Franklin County Ma.

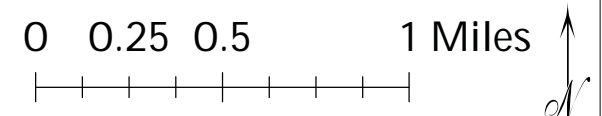
	Permanently Protected Open Space		Slope > 25%
	BioMap2 Core Habitat		Town Hall
	Prime Farmland Soils		School
	Wetland		Road
	Priority Habitats for Rare & Endangered Species*		Rail Line
	Certified Vernal Pool*		River, Stream
			Water Body

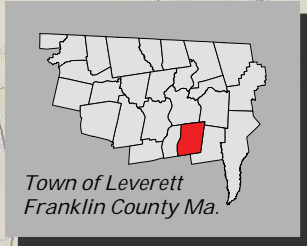
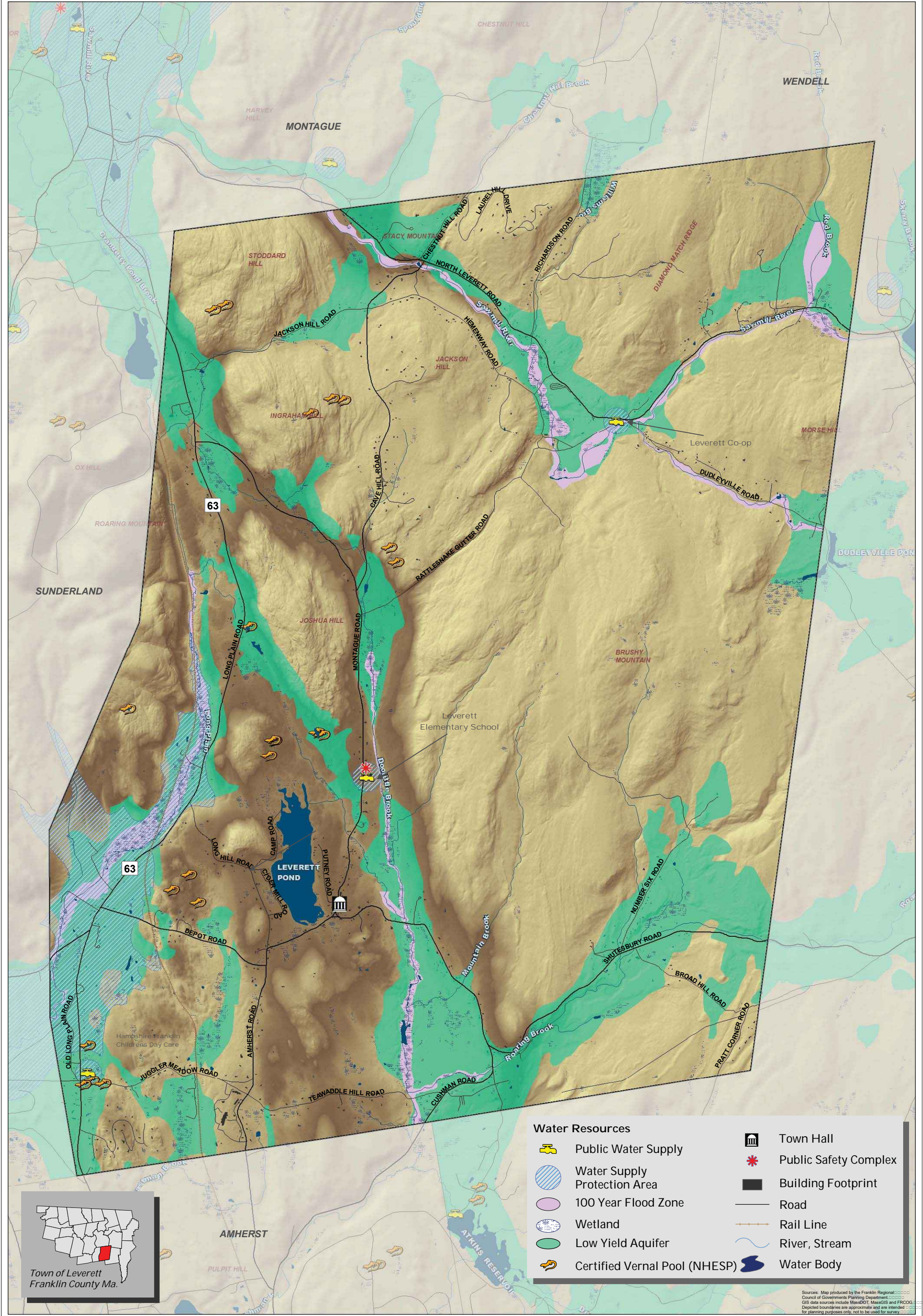
\*Natural Heritage & Endangered Species Program

Source: 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 Leverett Soils & Environmental Constraints

## Open Space & Recreation Plan 2018-2019



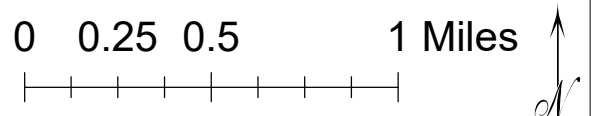


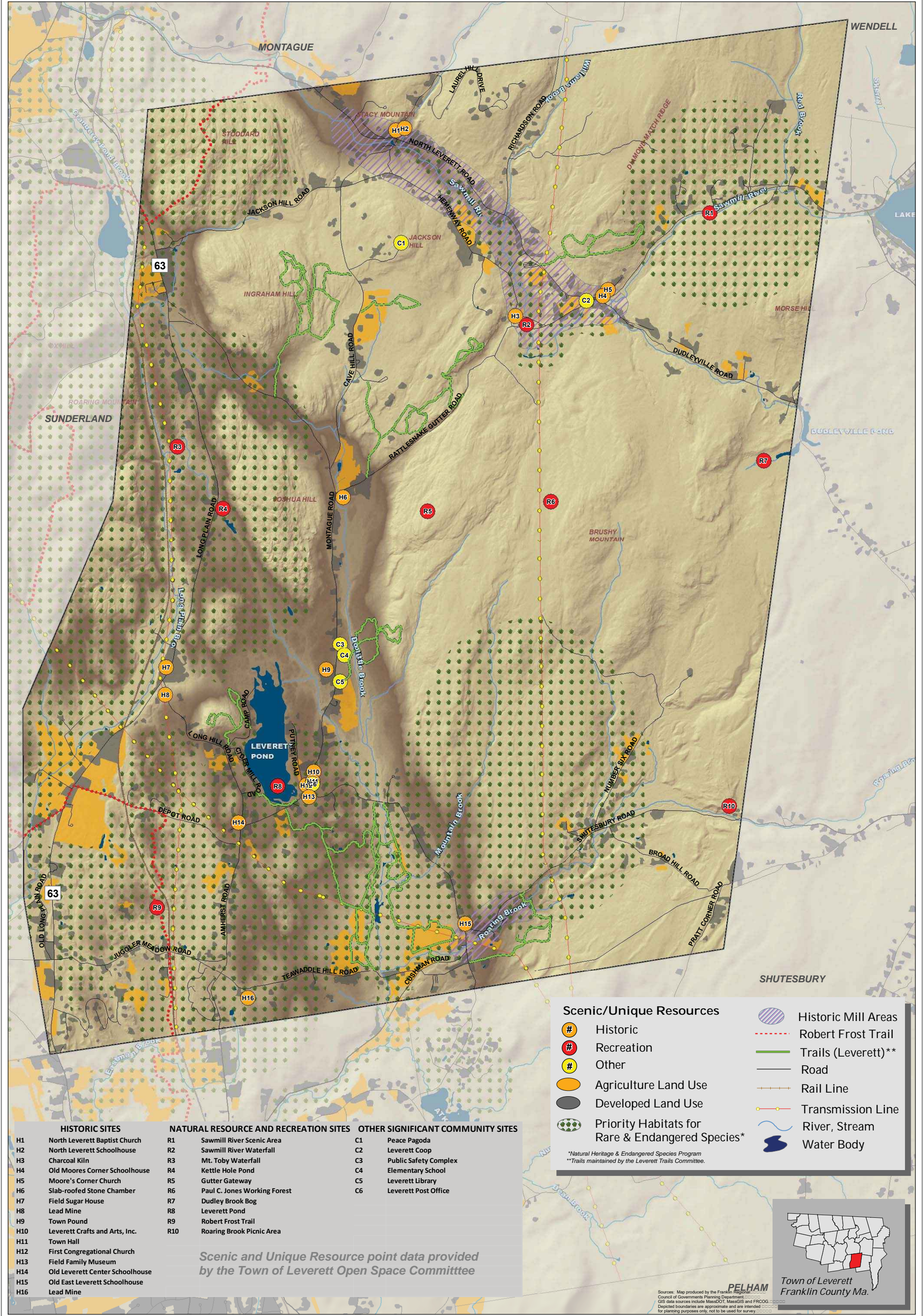
- |                               |                       |                    |
|-------------------------------|-----------------------|--------------------|
| <b>Water Resources</b>        | Public Water Supply   | Town Hall          |
| Water Supply Protection Area  | Public Safety Complex | Building Footprint |
| 100 Year Flood Zone           | Road                  | Rail Line          |
| Wetland                       | River, Stream         | Water Body         |
| Low Yield Aquifer             |                       |                    |
| Certified Vernal Pool (NHESP) |                       |                    |

Source: 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 Leverett Open Space & Recreation Plan 2018-2019

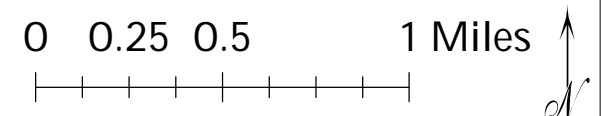
## Water Resources





# Town of Leverett Open Space & Recreation Plan 2018-2019

## Scenic Resources & Unique Environments



# SECTION 5

## **INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST**

Open space in Leverett consists of forests, farms, conservation lands, and recreation areas under both public and private ownership and management. This section of the Leverett Open Space and Recreation Plan (OSRP) inventories and categorizes parcels of undeveloped land and open space by ownership, use, and level of protection from development. It identifies parcels of undeveloped land that are individually, or in the aggregate, considered to be of interest because they help conserve ecosystems and ecosystem services, scenic landscapes, the area's rural character, and current and future recreation resources for Leverett's residents. Lands of conservation interest are those parcels of land that are considered important because they are already protected from development or because they could be a priority for protection.

Communities across the country have determined that protecting land from development is a means to ensure certain aspects of their landscape are conserved. Leverett's productive forests, wetland systems, remaining farmland and scenic views could be marred by the impacts of inappropriate development.

Protected land has legal restrictions that prohibit the parcel from being developed for residential, commercial, or industrial uses. Permanently protected land enjoys the highest degree of protection from development. In Massachusetts, there are a number of ways in which land can be considered permanently protected: the land may be owned by a state conservation agency, a conservation land trust, or a municipal conservation commission; or, a conservation restriction may be attached to the deed. Town-owned land with recreational purposes stated in its deed is permanently protected under Article 97. A vote of two-thirds of the State legislature is required for any development to occur on these protected parcels.

This section of the Leverett OSRP provides a comprehensive inventory of the lands that provide open space, wildlife habitat, agricultural and forest



**Small Stream in Leverett (Lori Lynn Hoffer)**

products, watershed protection, scenic beauty, and recreation opportunities for the benefit of all of Leverett's residents. The inventory accompanied by the Open Space Map shows the location, types, and distribution of conservation lands in Leverett. This inventory is divided into two main sections based on type of ownership: 1) private, and 2) public and non-profit. Within each of these major categories, parcels are differentiated by use (farm or forestland), by ownership and management, and by level of protection: permanent, limited, and temporary (See Table 5-1).

Most natural processes do not follow political boundaries, but land ownership is an important consideration for Town officials who aim to protect land for conservation purposes. Land owned by DCR or MassWildlife is considered to be permanently protected from development, while privately owned land is only permanently protected if a conservation restriction is attached to its deed. Although other factors relating to ownership are important to consider for open space planning purposes, such as level of management and public access, these are often considered secondary to the level of protection from development. This is because development can have a permanent impact on natural and cultural resources.

All municipal property must be accessible to people with disabilities. The municipal parks and conservation areas in Town were evaluated for accessibility by Kessler McGuinness & Associates, LLC. The results of the evaluation and recommendations for improvement are located in Appendix A of this OSRP. The Town of Leverett does not have any identified environmental justice areas. However, protected open space is located throughout Leverett and is particularly available close to village centers in town.

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

<b>PRIVATELY OWNED PROTECTED OPEN SPACE</b>	<b>Area in Acres</b>
<b>Farmland</b>	
<i>Permanently Protected by Agricultural Preservation Restriction</i>	0.0
<i>Temporarily Protected under Ch. 61A</i>	340.5
<b>Forestland</b>	
<i>Permanently Protected by a Conservation Restriction</i>	3,858.2
<i>Temporarily Protected</i>	
Chapter 61F	2,568.1
Chapter 61B	1,380.5
Total Temporarily Protected	<b>4,289.1</b>
<b>TOTAL PRIVATELY OWNED PROTECTED OPEN SPACE</b>	<b>8,147.3</b>
<b>PUBLICLY OWNED PROTECTED OPEN SPACE</b>	
<i>Permanently Protected by State Conservation Agencies</i>	
State Department of Recreation and Conservation	587.7
<i>Land Permanently Protected &amp; Owned by Town of Leverett</i>	390.0
<i>Land with Limited Protection &amp; Owned by Town of Leverett</i>	179.6
<b>TOTAL PUBLICLY OWNED PROTECTED OPEN SPACE</b>	<b>1,157.3</b>

### **A.1 Permanently Protected Land**

Land permanently protected from development may be owned by a state agency or by the town. For example, Mount Toby State Forest is owned by the Commonwealth of Massachusetts, and is under the management of the University of Massachusetts-Amherst and the Massachusetts Department of Conservation and Recreation (DCR). Land owned by the Town of Leverett under the authority of the Conservation Commission is also considered to be permanently protected from development under Article 97 regulations, which requires a two-thirds majority vote of the State Legislature to convert open space to another use.

Farmland can be permanently protected from development when a landowner chooses to sell his/her development rights to a land trust or state agency. The Massachusetts Department of Agricultural Resources (MDAR) purchases the development rights of farmland through their Agricultural Preservation Restriction (APR) Program. The APR Program typically pays the landowner the difference between the market value and the agricultural value of the land. MDAR favors towns that provide matching funds, which are typically 5 percent of that amount or up to \$500 per acre. Leverett's Community Preservation Act Funds can be used as a match for this program. In this way towns can leverage 95 percent of the cost of purchasing development rights towards protecting the farmland of willing landowners.

Currently there are no farms in the APR program in Leverett.

### **A.2 Temporarily Protected Land**

Land considered to be of limited protection includes any town-owned open space that is not under the authority of the Conservation Commission, which could be developed through a decision by the Select Board or by Town Meeting vote. Examples of town-owned open space include cemeteries, small parks, and old landfills. In Leverett, temporarily protected town-owned properties include land around town buildings such as the Town Hall and Public Safety complex, as well as properties acquired as tax takings.

The Chapter 61, 61A and 61B lands are also considered to have a temporary level of protection from development. The Chapter 61 programs offer a reduced tax assessment on privately owned working land. Landowners that choose to participate in this program therefore receive a reduction in property taxes on the portion of their land that is in active production as agriculture or forestland, or available for public recreation. There are three Chapter 61 programs: Chapter 61 for Forestry, Chapter 61A for Agriculture, and Chapter 61B for Recreation.

In order to participate in the Ch. 61 Program, landowners must manage their forestland under a ten-year management plan. The aim of this program is to temporarily keep working forests undeveloped.



In order to participate in the Chapter 61A program, a landowner must have at least 5 acres of land currently in active agriculture, and apply every year to enroll their parcels of land in the program. The aim of this program is to temporarily keep farmland in active agricultural production.

The 61B program also promotes the private ownership of open space, with the requirement that land enrolled in the program be used for public and private recreation purposes, or as open space. No management plan is required, but the tax savings are smaller. Commercial timber harvesting is not allowed on lands in the Ch. 61B program.

Lands in the Chapter 61 program are considered to be only temporarily protected because a landowner may remove land that is enrolled in the Ch. 61 Program at any time by paying a penalty tax. If the landowner receives a formal offer from another party to purchase a parcel of land that is currently in one of the Ch. 61 Programs (61, 61A, 61B), the landowner must notify the town. The town then has 120 days to exercise its right of first refusal by matching the bona-fide offer, or to transfer this right to a conservation organization.

The ability to transfer the right of first refusal to a conservation organization enables the town to create more protected open space without being burdened by the relatively short time frame for action. Private conservation land trusts often have the ability to produce creative and successful fundraising campaigns in short periods of time, while DCR and the Massachusetts Division of Fisheries and Wildlife (MassWildlife) may be interested in purchasing the land in the near future. While it may be difficult to bring a decision on a land purchase to a Special Town Meeting within 120 days, the negotiating process between a land trust, a state conservation agency, and a landowner can be often completed in a shorter period of time. It is therefore helpful for town officials and/or committees to maintain established relationships with conservation organizations such as DCR, MassWildlife, New England Forestry Foundation (NEFF), and local land trusts such as the Rattlesnake Gutter Trust (RGT).

## **B. PRIVATELY OWNED PARCELS**

The majority of open space in Leverett is privately owned by private residents and by the W.D. Cows, Inc. Land Company. No farmland parcels are permanently protected from development through the Massachusetts Department of Agricultural Resources APR program. Others, however, are temporarily protected from development through the Massachusetts Ch. 61 Program. The remaining privately owned lands are unprotected. They are discussed in this Open Space and Recreation Plan because privately owned open space may contain important wildlife habitat, offer unique recreational opportunities, or provide a potential connection between other permanently protected parcels. In some cases, unprotected parcels may be deemed valuable enough by the community to consider purchasing, if available for sale, or helping to protect through conservation easements of other options.

In the following tables, privately owned agricultural land, privately owned forest land, and forested parcels owned by W.D. Cows Inc. are identified by assessors' map and lot numbers. W.D. Cows owns approximately 3,989 acres of open space in Leverett, or 41 percent of the total open space in town, including some of the largest tracts of forest land. The total acreage owned by W.D. Cows in Leverett is 3991.2 acres, or 28 percent of the total land area in the town.

Private landowners (including W.D. Cows) together control approximately 87 percent of the open space in Leverett. Some of this privately owned land is in pasture but most is in forest. These open space parcels are still on the tax rolls, whether the land is protected or not. Many landowners have taken advantage of the Chapter 61 programs as evidenced by the fact that there are 4,289.1 acres of open space (29% of the total land area) in the 61A, 61B and 61F Programs combined.

In the following tables, Privately Owned Agricultural, Recreational, and Forest Lands are listed by level of protection from development. The ownership of the land is provided with the associated assessors map-lot number and acreage. The current use is based on the vegetation. Farmland may be pasture in Leverett, while forest is presumed to be used as such, whether it is managed for timber or not. Public access on private land may not be permitted, and if it is, is subject to change. State conservation agencies often require some level of public access before paying for, or accepting conservation restrictions. Public access is not a requirement for enrollment in any of the Ch.61 programs including the Ch.61B Recreation Program. It is assumed that given the nature of these open space parcels, access to them by people with disabilities is also not guaranteed.

Important characteristics that could motivate the town to consider acting on their right of first refusal for a Ch.61 parcel, or negotiating with a willing landowner for a fair purchase price, may include the presence of prime farmland soils, pasture, wetlands, a portion of the land that is above an aquifer, or rare or endangered species habitat. In addition, the parcel may be deemed very important as a link in a potential greenway or trail network, or as a component of a large block of contiguous forest.

### **B.1 Privately Owned Agricultural Land**

According to the Leverett Assessor's records, there is no agricultural land in town that is permanently protected. Not as bountiful as forests, Leverett's agricultural lands are a unique part of the landscape that contributes significantly to the town's rural character. The parcels in Table 5-2 below are currently farmed and have limited protection from development. These parcels are enrolled in the Chapter 61A program. The zoning of all of the parcels is Rural Residential.

**Table 5-2: Privately Owned Agricultural Land with Limited Protection from Development**

Owner	Chapter Program	Map-Lot	Acres
AHEARN ELIZABETH A	61A	2-0-65B	11.7
ARCHER BRADFORD G	61A	5-0-19	6.5
BAGDON JOSEPH K	61A	7-0-5	1.7
CROCKER LEESA	61A	4-0-11	3.0
CROCKER LEESA	61A	4-0-11A	3.0
CROCKER LEESA	61A	2-0-95B	4.8
CROCKER LEESA	61A	4-0-4	21.9
DELANO ANN J	61A	2-0-67	5.3
FITZPATRICK DENNIS	61A	7-0-104	18.9
FITZPATRICK DENNIS	61A	7-0-105	62.0
KONIECZNY KARL	61A	7-0-13	12.1
LENZ ANDREW N	61A	2-0-6	10.0
ROCASAH PHILIP J JR	61A	5-0-23	9.0
SEAMON NICHOLAS	61A	2-0-84	33.0
SEAMON NICHOLAS	61A	2-0-57	55.0
STARKWEATHER ANDREW J	61A	1-0-141E	3.2
STARKWEATHER ANDREW J	61A	1-0-141K	9.8
STARKWEATHER ANDREW J	61A	1-0-141L	17.5
ZAK JOSEPH F	61A	5-0-21	52.0
<b>Total acres</b>			<b>340.5</b>

Source: Town of Leverett Assessors Records; March 2019.

## B.2 Privately Owned Forested Land

Some of the largest tracts of unbroken forest land in Leverett (two of which are designated by BioMap2 as among the best in the state) are privately owned. Large blocks of contiguous forest support and sustain woodland species with specialized habitats that can be irreparably lost once a forest is fragmented by roads and development. The Rattlesnake Gutter Trust has been working with landowners in the northwestern corner of Leverett to protect parcels that would connect state-owned land and protect NHESP Priority Habitat of Rare Species around Stoddard Hill.

The following two tables list privately owned forestland with different levels of protection from development. Permanently protected forestland exists when landowners have donated or sold their development rights to a state conservation organization or a land trust. The landowners retain the other rights of ownership and they continue to pay property taxes, though these taxes are lower due to the reduced value of their land. Leverett currently has two dozen privately owned properties that are permanently protected from development with a conservation restriction (see Table 5-3).

**Table 5-3: Forestlands with Permanent Protection from Development\***

Owner	Acres	Map/Lot	Zoning District
BLANCHARD JEFFREY L	6.77	7-0-122A	Residential/Village (RV)
CHEYETTE OREN N	9.34	8-0-122	Residential/Village (RV)
COWLS W D INC	172.70	2-0-108	Rural Outlying Residential (RO)
COWLS W D INC	2819.00	4-0-56	Rural Outlying Residential (RO)
GIBAVIC, DONALD L TRUSTEE	40.00	3-0-57	Rural Outlying Residential (RO)
KUZMESKI PAUL W	3.00	8-0-130	Residential/Village (RV)
MITCHELL, GWYN, C&N WILLIAMS TRUSTEES	152.00	7-0-179	Rural Outlying Residential (RO)
POZAR DAVID	0.92	7-0-157B	Residential/Village (RV)
RATTLESNAKE GUTTER TRUST	24.58	1-0-77B	Rural Outlying Residential (RO)
SCHEFFEY ELIZABETH W	62.07	8-0-43	Rural Residential (RR)
SCHEFFEY ELIZABETH W	71.36	8-0-42	Rural Outlying Residential (RO)
SCHEFFEY HESTON C + ANNA MARIA	12.00	8-0-151	Rural Outlying Residential (RO)
SCHEFFEY HESTON C + ANNA MARIA	80.55	8-0-152	Rural Outlying Residential (RO)
SCHUYLER ANNE K	38.65	7-0-201	Rural Outlying Residential (RO)
SMITH NANCY V A	42.50	8-0-92	Rural Outlying Residential (RO)
SMITH NANCY V A	2.11	8-0-91	Rural Residential (RR)
SMITH NANCY V A	72.90	8-0-7	Rural Outlying Residential (RO)
SPENCER BRUCE A	35.00	2-0-111	Rural Outlying Residential (RO)
SPENCER BRUCE A	89.30	2-0-119	Rural Outlying Residential (RO)
SPENCER BRUCE A	22.00	2-0-120	Rural Outlying Residential (RO)
TODD SARAH	42.00	3-0-31	Rural Residential (RR)
TODD SARAH	55.10	3-0-41	Rural Residential (RR)
WEISKEL PORTIA	2.20	5B-0-22	Residential/Village (RV)
WOLF TILMAN	2.76	5-0-49A	Rural Residential (RR)

Source: Town of Leverett Assessors Records; March 2019.

\*These Conservation Restrictions represent all of the CR's currently in town.

Land that is considered temporarily protected from development includes those lands enrolled in the Ch.61 B and F Programs. All of the parcels in Table 5-4 are temporarily protected in the Ch. 61B Recreational Open Space and the Ch. 61F Forestland Classification and Taxation Program, and the degree of protection of these parcels is short term. The owner noted is also the manager of the parcel. There are no public grants awarded as a result of the Program; however, the owner does receive a property tax break over a ten-year period. All zoning in Leverett is either Rural Residential, Rural Outlying Residential, or Residential/Village.

**Table 5-4: Forestlands with Temporary Protection from Development Enrolled in the Ch.61 B Recreational Open Space and Ch, 61F Forestland Taxation Program**

Owner	Chapter Program	Map-Lot	Acres
ASHBY CAROL A	61B Recreational Open Space	8-0-93	13.0
BOUCHER JOHN, PAUL, ROGER J JR	61B Recreational Open Space	8-0-20B	23.5
BROWNELL KENNETH C	61B Recreational Open Space	4-0-37	54.1
BRYANT FUNDING TRUST	61B Recreational Open Space	1-0-39	42.7
CIVELLO DEE ANN	61B Recreational Open Space	2-0-68	7.3
CIVELLO DEE ANN	61B Recreational Open Space	2-0-65A	20.0
COHEN BRUCE & CHRISTINE TRUSTEES	61B Recreational Open Space	3-0-35	23.9
DERRICO PETER	61B Recreational Open Space	3-0-12B	11.3
EISENSTEIN DVORA	61B Recreational Open Space	5-0-110	60.0
FIELD JEFFREY A	61B Recreational Open Space	5-0-6	43.5
FIELD JOHN	61B Recreational Open Space	5-0-7A	8.1
FIELD JOHN	61B Recreational Open Space	5-0-7C	12.0
FRYE RICHARD	61B Recreational Open Space	2-0-65C	27.9
GRAVES DOUGLAS L	61B Recreational Open Space	2-0-38	22.5
GRIFFITH DANIEL W	61B Recreational Open Space	1-0-27B	25.9
HAPGOOD GAY	61B Recreational Open Space	7-0-35A	40.7
HICKS JAMES	61B Recreational Open Space	1-0-21	33.9
HOWARD PHILIP	61B Recreational Open Space	1-0-102	21.3
HOWARD PHILIP E	61B Recreational Open Space	1-0-106	1.5
INGRAM JUDITH A	61B Recreational Open Space	7-0-90	29.5
JACKSON HILL ROAD REALTY TRUST	61B Recreational Open Space	1-0-55	35.0
JEKANOWSKI JOHN F	61B Recreational Open Space	8-0-37	21.8
KAHN KENNETH	61B Recreational Open Space	2-0-65	22.6
KARSTEN, RICHARD P	61B Recreational Open Space	4-0-27	7.4
KLAUS E KRONER REVOCABLE TRUST	61B Recreational Open Space	7-0-192	31.7
KOSLOSKI JOHN A	61B Recreational Open Space	8-0-94	42.6
KOSLOSKI PETER G JR + JOHN A	61B Recreational Open Space	8-0-159	20.0
LACLAIRE LEIGHTON T	61B Recreational Open Space	1-0-58A	3.4
LACLAIRE LEIGHTON T	61B Recreational Open Space	1-0-57	40.0
LACLAIRE LEIGHTON T	61B Recreational Open Space	1-0-58	10.6
LACLAIRE MERRILL	61B Recreational Open Space	1-0-23A	9.4
LACLAIRE MERRILL	61B Recreational Open Space	1-0-23	25.6
LEWIS MARK D	61B Recreational Open Space	5-0-93A	30.8
MCCORMICK CATHLEEN B	61B Recreational Open Space	2-0-86A	10.0
MCCORMICK MICHAEL J	61B Recreational Open Space	2-0-86B	18.5
MT TOBY MEETING OF FRIENDS	61B Recreational Open Space	5-0-16	97.9
NELSON M CHRISTINE	61B Recreational Open Space	5-0-17	10.4
PALMER DAVID C	61B Recreational Open Space	2-0-55	9.3
PEMBERTON JOHN	61B Recreational Open Space	1-0-15	14.7
PETERSON DORIS D TRUSTEE	61B Recreational Open Space	4-0-47	20.9
RICE DAVID	61B Recreational Open Space	5-0-7B	12.3
ROBINSON DONALD A	61B Recreational Open Space	1-0-27	37.0
SHEA LAUREEN	61B Recreational Open Space	2-0-44	15.0

Owner	Chapter Program	Map-Lot	Acres
SHEA LAUREEN, CARULLI BARBARA	61B Recreational Open Space	2-0-45	75.2
SHIVELY JULIA A	61B Recreational Open Space	2-0-31	31.0
TEVELDE, RANDALL D	61B Recreational Open Space	5-0-93	21.4
WARNER LEE ANN	61B Recreational Open Space	5-0-113	38.7
WEGEL GABE	61B Recreational Open Space	4-0-56A	20.5
WOJTOWICZ EDWARD	61B Recreational Open Space	6-0-3	42.0
WOODARD PHILIP	61B Recreational Open Space	7-0-189	18.4
YARBROUGH ROBERT M	61B Recreational Open Space	1-0-46	29.8
ZUZGO PATRICIA ANN	61B Recreational Open Space	7-0-100	7.8
ZUZGO PATRICIA ANN	61B Recreational Open Space	7-0-92	26.4
ADAMS PAUL W	61F - Forestry	8-0-124	55.0
ADAMS PETER K	61F - Forestry	8-0-117	56.0
BENANDER DONALD H	61F - Forestry	1-0-98	25.3
BENANDER THOMAS M	61F - Forestry	1-0-98A	24.0
BOYSEN CHRISTIAN	61F - Forestry	3-0-12F	1.4
BOYSEN CHRISTIAN	61F - Forestry	3-0-12E	19.5
BOYSEN CHRISTIAN	61F - Forestry	3-0-12	27.8
CALL, BRUCE D	61F - Forestry	5-0-105	92.5
CAREW DONALD K	61F - Forestry	7-0-85	30.0
COWLS W D INC	61F - Forestry	5-0-82	1.8
COWLS W D INC	61F - Forestry	8-0-150	3.0
COWLS W D INC	61F - Forestry	8-0-156	9.1
COWLS W D INC	61F - Forestry	8-0-148	9.3
COWLS W D INC	61F - Forestry	5-0-78	11.0
COWLS W D INC	61F - Forestry	2-0-37	39.6
COWLS W D INC	61F - Forestry	4-0-61	40.0
COWLS W D INC	61F - Forestry	4-0-35	54.6
COWLS W D INC	61F - Forestry	3-0-23	58.0
COWLS W D INC	61F - Forestry	8-0-149	61.6
COWLS W D INC	61F - Forestry	3-0-22A	65.0
COWLS W D INC	61F - Forestry	3-0-48	71.0
COWLS W D INC	61F - Forestry	2-0-25	101.0
COWLS W D INC	61F - Forestry	5-0-13	109.0
COWLS W D INC	61F - Forestry	5-0-76	363.3
CRAWFORD MOORE, LLC	61F - Forestry	2-0-118	23.0
CROWE DIANE R	61F - Forestry	1-0-75	28.1
DOWNEY, JOSEPH E + GORDON A	61F - Forestry	8-0-4	45.9
DRURY RICHARD	61F - Forestry	4-0-32	7.1
ELDER, DOUGLAS C ELDER STRACHAN, MARTHA	61F - Forestry	6-0-4	42.0
FIELD CARLYLE A	61F - Forestry	7-0-211	77.6
GLAZIER RONALD P	61F - Forestry	3-0-50	16.9
HANKINSON, RICHARD E	61F - Forestry	7-0-120	60.5
HERONEMUS PHYLLIS R TRUSTEE	61F - Forestry	5-0-33	96.2
KENERSON LAUREY	61F - Forestry	2-0-52	25.0

Owner	Chapter Program	Map-Lot	Acres
LEBOW JOSH MYERS CARRIE A	61F - Forestry	8-0-1	29.8
MACCONNELL WILLIAM P ESTATE	61F - Forestry	8-0-62	53.0
MORGAN WARREN HARRIS	61F - Forestry	1-0-77	30.6
PELIS ROBERT	61F - Forestry	2-0-46	25.0
REDBROOK FARM LLC	61F - Forestry	2-0-51	67.0
REDBROOK FARM LLC	61F - Forestry	2-0-34	230.0
ROBERTS HUGH D + CIANNE G	61F - Forestry	3-0-59	55.3
SCOTT JANE	61F - Forestry	3-0-12G	1.4
SCOTT JANE	61F - Forestry	3-0-12D	2.0
SHUMWAY ALAN R	61F - Forestry	5-0-2	15.5
SMITH ALLEN C TRUSTEE	61F - Forestry	8-0-35	2.0
SMITH ALLEN C TRUSTEE	61F - Forestry	8-0-36	61.2
STEVENS THOMAS	61F - Forestry	2-0-61	8.2
STEVENS THOMAS H	61F - Forestry	2-0-73	1.5
STEVENS THOMAS H	61F - Forestry	2-0-59	5.5
STEVENS THOMAS H	61F - Forestry	2-0-60	8.5
STEVENS THOMAS H	61F - Forestry	2-0-61A	28.0
STOCKWELL NANCY RIVERS DONNA & JAMES	61F - Forestry	7-0-83	25.8
STRONG ROBERT O	61F - Forestry	5-0-19A	29.3
TINER, RALPH W	61F - Forestry	3-0-42B	26.8
WARNER LEE ANN	61F - Forestry	5-0-111	21.3
WEBBER SUZANNE	61F - Forestry	1-0-62	30.5
WESTERN MASS ELECTRIC CO	61F - Forestry	8-0-157	10.0
WILLIAMS RICHARD K	61F - Forestry	2-0-5C	2.2
WILLIAMS RICHARD K	61F - Forestry	2-0-5D	2.3
WILLIAMS RICHARD K	61F - Forestry	2-0-5H	3.6
WILLIAMS RICHARD K	61F - Forestry	2-0-27A	19.5
WILSON HARRY H	61F - Forestry	4-0-24	21.3
<b>Total acres</b>			<b>3948.6</b>

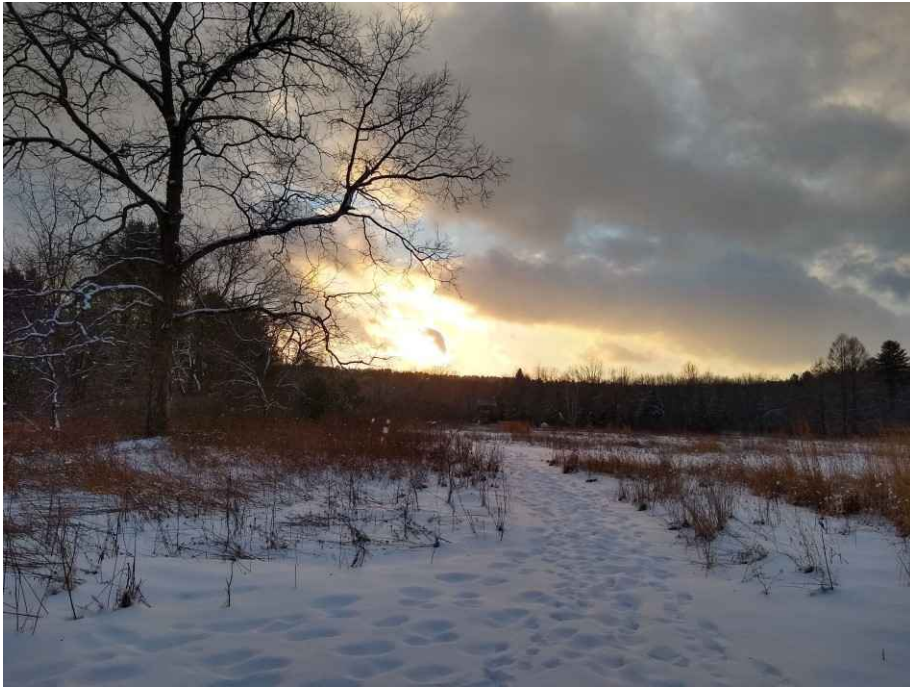
Source: Town of Leverett Assessors Records; March 2019.

### **B.3 Significant Private Land Holdings With Protection in Leverett**

As previously mentioned, the W.D. Cowls Lumber Company owns approximately 3991.2 acres in Leverett, or 28 percent of the total land area in the town. Of those 3991.2 acres, 2991.7 are permanently protected through Conservation Restriction, and 997.3 acres are under limited protection through the Ch. 61F program. Only approximately 2.2 acres are unprotected.

Rattlesnake Gutter Trust is the largest private land conservation organization in Leverett. The Trust owns 283.4 acres in Leverett, of which only 24.6 acres are permanently protected (by conservation restriction), and 259 acres are under limited protection. The Rattlesnake Gutter Trust is currently in the process of obtaining conservation restrictions for all of their properties in order to guarantee their protection as open space in

perpetuity, in alignment with the organization’s mission “to protect the natural and scenic area of Leverett” (Rattlesnake Gutter Trust website).



**East Leverett Meadow, a property owned and managed by the Rattlesnake Gutter Trust (K.M. Connolly)**

### **C. PUBLIC AND NON-PROFIT PARCELS**

State conservation agencies and the Town of Leverett own approximately 8.4% of Leverett's land, or 1196.9 acres. Almost all of this land is permanently protected from development under Article 97 protections and/or conservation restriction. Some town-owned parcels that are not under the authority of the Leverett Conservation Commission are under limited protection. The following inventory includes those parcels that are owned by the Commonwealth of Massachusetts and Leverett.

#### **C.1 Publicly Owned Open Space**

Publicly owned open space in Leverett includes land owned by the Commonwealth of Massachusetts, UMass-Amherst, and the Town of Leverett. All of the State-owned land is managed by the Department of Conservation and Recreation (DCR), Division of Fisheries & Wildlife (DFW) and by the UMass-Amherst Department of Natural Resources Conservation.

DCR's lands are located predominantly in the northwest portion of the town in the Leverett portion of Mt. Toby State Forest; in adjoining parcels on Stoddard Hill; and on Brushy Mountain. Large portions of these areas are listed as Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife by NHESP. In total, DCR owns 611



acres in Leverett spread across 14 parcels. UMass-Amherst owns and manages 32.7 acres in Leverett (2 parcels) which comprise part of the 755 acre Mt. Toby Demonstration Forest located in Leverett and Sunderland, used for sustainable forestry education and management.

Mount Toby, at 1,269 feet, is considered one of the most biodiverse areas in New England. It is home to 15 state-listed plants, including a high concentration of rare and state-listed fern and orchid species. In addition, the site contains a large and unusual complex of naturally vegetated wetlands, and calcium-rich slopes that provide habitat for many unusual and rare plants and animals. Unlike the surrounding region, Mount Toby was never cleared of its timber during New England's intensive agricultural period in the 18th and 19th centuries: it has remained wooded throughout, although timber harvesting played a part in its history and continues to occur today.

Table 5-8 lists parcels of permanently protected public land owned by the Commonwealth of Massachusetts or by the Town of Leverett and under the control of the Conservation Commission. All of the State-owned parcels are forested and managed by DCR and UMass-Amherst.

**Table 5-8: Publicly Owned Land Permanently Protected from Development**

Property Owner	Property Manager	Site Name	Acres	Map-Lot	Current Use	Condition	Recreation Potential	Public Access*	Zoning	Type of Grant Received (if any)
TOWN OF LEVERETT	LEVERETT CON COMM	Roaring Brook Conservation Area	51.0	8-0-58	Forest, trails	Good	High – trails.	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Williams Family Conservation Area	16.0	7-0-178	Wetland, forest, trails	Good	High- trails	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Heronemus Conservation Area	4.5	7-0-115E	Forest	Good	Medium – connects to McIntire CA, but small	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Gordon King Conservation Area	31.0	7-0-223	Forest, wetland, trails, blueberries	Good, though with some historic debris	High- trails / blueberries	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Gordon King Life Estate	4.0	5-0-112	Forest	Good	Medium – Small, abuts Paul C Jones Working Forest	Free/Limited (access through private property)	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Stetson Adams Memorial Woodlot	13.1	8-0-3	Forest	Good	Medium- Abuts Paul C Jones Working Forest, other town land	Free	Rural Outlying Residential (RO)	CPA
TOWN OF LEVERETT	LEVERETT CON COMM	Woodard’s Corner	5.6	7-0-222	Wetland, trails	Good	High – trails	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Gordon King Life Estate	34.0	8-0-2	Forest	Good	Medium – abuts Paul C Jones Working Forest, other town land	Free	Rural Outlying Residential (RO)	N/A
TOWN OF LEVERETT	LEVERETT CON COMM	Woodard’s Corner	3.6	8-0-161	Forest	Good	High – trails	Free	Rural Outlying Residential (RO)	N/A
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Holmes Property	0.7	5A-0-34	Forest, lakefront	Good	Medium – Lake access	Free	Residential/Village (RV)	N/A
TOWN OF LEVERETT	LEVERETT CON COMM	Bill Rivers Conservation Area	53.0	5-0-107	Forest, trails	Good	High – trails, used by school..	Free	Rural Outlying Residential (RO)	N/A

Property Owner	Property Manager	Site Name	Acres	Map-Lot	Current Use	Condition	Recreation Potential	Public Access*	Zoning	Type of Grant Received (if any)
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Rattlesnake Gutter Conservation Area	40.0	3-0-70	Forest, trails	Good	High – trails	Free	Rural Residential (RR)	N/A
TOWN OF LEVERETT	LEVERETT CON COMM	Rattlesnake Hill Conservation Area	18.0	3-0-66	Forest, trails	Good	High – trails	Free	Rural Outlying Residential (RO)	CPA
TOWN OF LEVERETT	LEVERETT CON COMM	Cave Hill Conservation Area	102.8	1-0-59	Forest, trails	Good	High, trails	Free	Rural Outlying Residential (RO)	CPA
LEVERETT CONSERVATION COMM	LEVERETT CON COMM	Clarkson Property	2.1	1-0-147A	Forest	Good	Medium – Access to Sawmill River	Free	Residential/Village (RV)	N/A
TOWN OF LEVERETT	LEVERETT CON COMM	Philip & Catherine Woodard Conservation Area	5.0	7-0-227	Wetland, forest	Good	High - trails	Free	Residential/Village (RV)	CPA
TOWN OF LEVERETT	LEVERETT CON COMM	Carlyle & Edith Field Conservation Area	1.0	5B-0-12A	Forest, lakefront	Good	High – trails	Free	Residential/Village (RV)	CPA
TOWN OF LEVERETT	LEVERETT CON COMM	David & Mary Field Conservation Area	3.9	5B-0-12F	Forest, lakefront	Good	High –trails	Free	Residential/Village (RV)	CPA
TOWN OF LEVERETT	LEVERETT CON COMM	Field and Congregational Church Property	0.8	5B-0-12G	Lakefront, boat access	Good	High – trails, lake access, boat launch	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	4.0	1-0-2	Forest	Good	Medium – abuts other state-owned properties	Free	Rural Outlying Residential (RO)	N/A
UNIVERSITY OF MASSACHUSETTS	UMass-Amherst	Mt. Toby Demonstration Forest	7.7	1-0-38	Forest	Good	High – trails, Robert Frost Trail	Free	Rural Residential (RR)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	8.0	1-0-1	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	10.0	1-0-25	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A

Property Owner	Property Manager	Site Name	Acres	Map-Lot	Current Use	Condition	Recreation Potential	Public Access*	Zoning	Type of Grant Received (if any)
COMMONWEALTH OF MASSACHUSETTS	DCR	Mt. Toby State Forest	10.8	3-0-85A	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	(unnamed)	11.5	4-0-58A	Forest	Good	Medium – abuts Paul C Jones Working Forest	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	20.0	1-0-3	Forest	Good	Medium – abuts other state-owned properties. Robert Frost trail.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	24.0	1-0-4	Forest	Good	Medium – abuts other state-owned properties. Robert Frost trail.	Free	Rural Outlying Residential (RO)	N/A
UNIVERSITY OF MASSACHUSETTS	UMass-Amherst	Mt. Toby Demonstration Forest	25.0	3-0-1	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	33.0	1-0-26	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Stoddard Hill Wildlife Management Area	47.2	1-0-28	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Mt. Toby State Forest	89.2	3-0-85	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Mt. Toby Wildlife Management Area	130.3	3-0-22	Forest	Good	Medium – abuts other properties with Conservation Restrictions	Free	Rural Outlying Residential (RO)	N/A
COMMONWEALTH OF MASSACHUSETTS	DCR	Mt. Toby State Forest	167.0	3-0-11	Forest	Good	Medium – abuts other state-owned properties.	Free	Rural Outlying Residential (RO)	N/A
<b>Total acres</b>			<b>977.7</b>							

Source: Town of Leverett Assessors Records; March 2019. \*Public access for all these properties is free.

The Town of Leverett owns approximately 557.1 acres of open space. Of this, 179.6 acres are under the authority of the Select Board and are therefore considered to have limited protection from development (Table 5-9). If residents wished to convert these lands from, for example, forest to sports fields, a Town Meeting vote could provide the authority. Lands held by the Conservation Commission require a two-thirds vote by the Massachusetts State Legislature to convert open space to another non-conservation use.

Leverett's Conservation Commission is working on identifying and prioritizing potential corridors for protection in Leverett. The Commission is pursuing these linkages between protected lands by assisting interested landowners in protecting their land through conservation restrictions and other methods. In addition, the Commission plans to analyze and prioritize the conservation value of currently unprotected parcels of land using GIS tools. The Conservation Commission has also been working closely with organizations such as the Rattlesnake Gutter Trust for assistance in land protection projects.

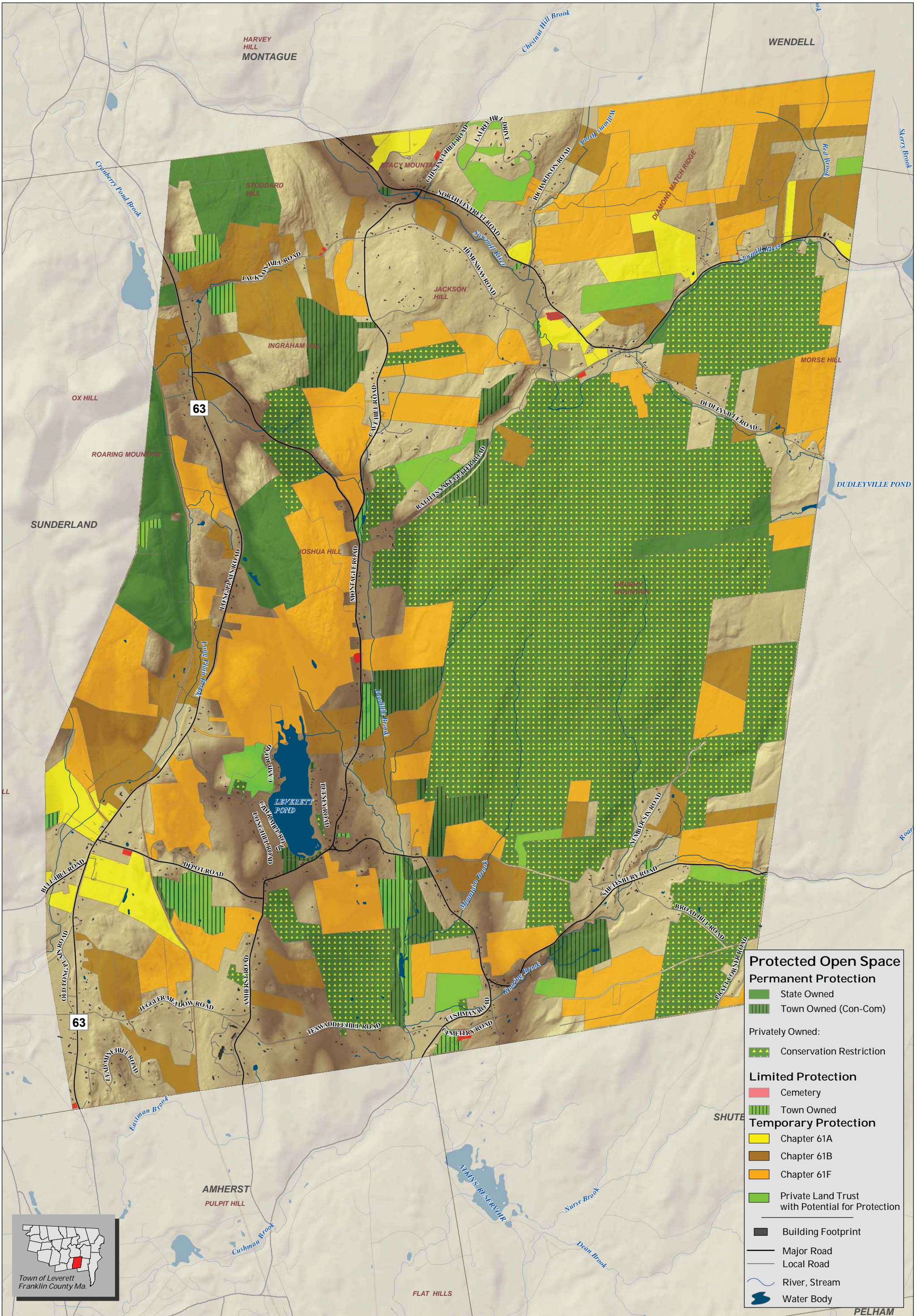
It is not unusual for a community to set aside land for the future expansion of schools, sports fields, police and fire stations, and to protect drinking water supplies. Properties for which a change of use is foreseen should be placed under the authority of the Select Board to allow for conversion from open space to active use. On the other hand, it is advisable to place town-owned land that does not provide for easy development but contains wetlands or wildlife habitat under the authority and protection of the Conservation Commission.

**Table 5-9: Town-Owned Parcels of Land with Limited Protection from Development**

Property Owner	Property Manager	Location	Acres	Map-Lot	Current Use	Condition	Recreation Potential	Public Access	Zoning	Type of Grant Received (if any)
TOWN OF LEVERETT	TOWN OF LEVERETT	Richardson Rd	0.1	2-0-2A	Road right-of-way	Good	None	Free	Rural Residential	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Old Coke Kiln Rd	0.5	4-0-5	Wetland	Good	Medium – wetland area with potential stream access.	Free	Rural Residential, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	FIRE DEPARTMENT	North Leverett Rd	0.9	2-0-12	North Leverett Fire station	Good	None	Free	Residential/Village, Aquifer Protection Overlay	CPA (for building repair)
TOWN OF LEVERETT	TOWN OF LEVERETT	Hemenway Rd	1.0	4-0-6	Wetland	Good	Medium – wetland area with potential stream access.	Free	Rural Residential, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Rear Cemetery Rd	10.7	8-0-138, 8-0-136	Transfer Station	Fair	None	Discouraged	Residential/Village, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Shutesbury Rd	2.7	8-0-31	Forest	Good	Low	Free	Rural Residential, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Rear Long Plain Rd	4.1	5-0-24	Forest	Good	Low	Free, through private property	Rural Outlying Residential	N/A
TOWN OF LEVERETT	CONSERVATION COMMISSION	Cave Hill Rd	5.2	3-0-51	Open Space/Park	Good	High –mown and maintained. Deed-restricted for “promotion and protection of the natural resources and for the protection of watershed resources”	Free	Residential/Village, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Rear Long Plain Rd	7.0	3-0-17	Forest	Good	Medium – contiguous with state-owned property	Free	Rural Outlying Residential	N/A

Property Owner	Property Manager	Location	Acres	Map-Lot	Current Use	Condition	Recreation Potential	Public Access	Zoning	Type of Grant Received (if any)
TOWN OF LEVERETT	TOWN OF LEVERETT	Rear Jackson Hill Rd	9.4	1-0-33	Forest	Good	Medium – Robert Frost trail	Need to cross through private property	Rural Outlying Residential	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Jackson Hill Rd	12.8	1-0-53	Forest	Good/High	Medium On Road, but small parcel. Doesn't connect	Free	Rural Residential	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Rear Jackson Hill Rd	14.0	1-0-34	Forest	Good	Medium – Robert Frost trail	Need to cross through private property	Rural Outlying Residential	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Montague Rd	16.5	5-0-109	Leverett Elementary School / Public Safety Complex	Good	High	Free	Residential/Village	N/A
TOWN OF LEVERETT	TOWN OF LEVERETT	Montague Rd	3.8	5-0-122	Town Hall	Fair	Low	Free	Residential/Village	N/A
TOWN OF LEVERETT	CONSERVATION COMMISSION	Teawaddle Hill Rd	22.0	8-0-124A	Wetland	Good	Medium – near other conserved areas, but very wet. Boardwalk?	Free	Rural Outlying Residential, Aquifer Protection Overlay	N/A
TOWN OF LEVERETT	CONSERVATION COMMISSION	Depot Rd	34.0	7-0-116	McIntire Property – Conservation Area	Good	High – Robert Frost trail	Free	Rural Outlying Residential	N/A
TOWN OF LEVERETT	CONSERVATION COMMISSION	Shutesbury Rd	35.0	7-0-221	4-H Forest Conservation Area	Good	High – trails.	Free	Rural Outlying Residential, Aquifer Protection Overlay	N/A
<b>Total Acres</b>			<b>179.6</b>							

Source: Town of Leverett Assessors Records; March 2019.



Town of Leverett  
Open Space &  
Recreation Plan 2018-2019

# Open Space

0 0.25 0.5 1 Miles

February 11, 2019





# SECTION 6

## **COMMUNITY VISION**

### **A. DESCRIPTION OF PROCESS**

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

- In 2005, Leverett completed an Open Space and Recreation Plan in concert with the completion of its Master Plan.
- In 2010, the town updated the Open Space and Recreation Plan to reflect existing conditions in Leverett and public consensus.
- Beginning in May 2017 to May 2019, the Open Space Planning Committee and the Franklin Regional Council of Governments Planning Department developed and updated the Open Space and Recreation Plan using several methods for involving public participation:
  - The Open Space and Recreation Survey results were used to support the development of Section 8 Goals and Objectives as well as the overall open space and recreation goals and vision.
  - Twelve public meetings were held by the Open Space Planning Committee and were open to the public.
  - Drafts of each section of the plan were sent to the Open Space Planning Committee members representing key town boards and community groups.
  - A public forum was held on May 28, 2019, where residents reviewed and discussed the inventory, analysis, community goals, objectives, and seven-year action plan. All public comments were recorded and incorporated into the plan.

### **B. STATEMENT OF OPEN SPACE AND RECREATIONAL GOALS**

The 2019 Survey results shows that Leverett's OSRP goals have changed in specificity, but not in character. People choose to live in Leverett because of its abundant natural resources, rural small town character, variety of outdoor recreation opportunities, and the community's focus and awareness of climate change and sustainability. Residents value the town's scenic beauty; the clean water of its Leverett Pond, streams, and wetlands; the large expanses of uninterrupted forest; diverse wildlife; and peace and quiet. The survey

results also show that a majority of town residents feel that the history of Leverett is important and worth protecting.

A future ideal Leverett will have conserved the majority of its uninterrupted forest, the purity of its air and water, and the mosaic of its remaining farmland. In addition, the effects of climate change will inform open space and recreation decisions in town. To help create this vision, the town will increase its education and outreach efforts to better inform residents about land use practices and recreational opportunities in town, as well as apply the latest Massachusetts guidelines on climate change resiliency planning. These achievements will enhance biodiversity and provide improved access to trails that connect both public and private open spaces. Leverett will also have protected its water resources and preserved and shared the stories and physical remains of its historic sites.

Recreation pastimes will include both active and passive activities such as hiking, walking/running, nature/birdwatching, boating, and bicycling. These pastimes are made available by the conservation areas in town, extensive trail systems, safe roads for pedestrians and bicyclists, and other recreational amenities.



**People Enjoying a Picnic at Leverett Pond (Friends of Leverett Pond)**

# SECTION 7

## **ANALYSIS OF NEEDS**

The Leverett Open Space and Recreation Plan incorporates the inventory of all the land-based natural, scenic, and cultural resources that are available in town (Section 4), identifies the most important parcels of land that contain these resources (Section 5), and based on the community's general goals (Section 6), makes comparisons between the supply of resources and the demand (Section 7). In the following section, the recreation and open space needs of residents are identified using the 2019 Open Space and Recreation Survey, data from Sections 3, 4, and 5, and committee input. Finally, the obstacles to the effective resolution 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**

Leverett residents value their forests, water bodies, and the quality of the air and drinking water in town. According to the 2019 Open Space Survey, 80 percent or more of survey respondents stated that it was important or very important to protect wildlife, streams, ponds, clean drinking water, forests, clean air, scenic views, and farmland.

According to the 2019 Open Space survey results, respondents' highest open space protection priorities are:

- 1) Protect land for wildlife habitat (52%);
- 2) Protect land from development (42%);
- 3) Protect drinking water resources (39%);
- 4) Protect land along rivers and streams (36%);
- 5) Encourage agriculture and protect farmland (32%).

Fortunately, these priorities are highly compatible. The protection of contiguous forestland and land along rivers and streams has the added benefit of also protecting drinking water and wildlife habitat.

Protecting land along water bodies provides multiple benefits. Riparian buffer areas help protect water quality by filtering and slowing stormwater runoff from adjacent land uses and support habitat for species that rely on cool water temperatures. Mitigating the use of road salt in the winters can also help protect water quality. Permanently protected land along water provides public access, depending on whether it is publicly or privately owned, and the details of the restriction on the property.

A total of 85 percent of Leverett’s land is forested and provides a rich habitat for wildlife, while helping maintain the town’s clean drinking water. Leverett has a significant amount of uninterrupted forestland, which is vital to wildlife diversity and resilience to the effects of climate change. Protecting biodiversity and providing corridors for wildlife have been raised as two important goals in the 2019 Open Space Survey and by the Open Space Committee. To achieve this, the Leverett Conservation Commission is working on identifying and prioritizing potential corridors for protection in town. The Commission is pursuing these linkages between protected lands by assisting interested landowners in protecting their land through conservation restrictions and other methods. In addition, the Commission plans to analyze and prioritize the conservation value of currently unprotected parcels of land using GIS tools.

## **B. SUMMARY OF COMMUNITY’S NEEDS**

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

The Commonwealth completed The Statewide Comprehensive Outdoor Recreation Plan (SCORP), *Massachusetts Outdoors 2017*, an update of the SCORP 2012 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. As part of the update process to the 2017 SCORP, a survey of Massachusetts residents was conducted to assess their desires and needs for outdoor recreation. The surveys show that the top priority for survey respondents is the desire for more trails of all kinds. Respondents said that they want more town-wide trail systems, hiking trails, and multi-use trails for both walking and bicycling. These priorities reflect the responses from the 2019 Open Space and Recreation Survey distributed to Leverett residents.

The 2019 Open Space and Recreation Survey, discussions at Open Space Planning Committee meetings, and research into the ownership, protection status, and use of existing open space parcels in Leverett, helped to identify several potential community needs relating to open space and recreation resources. They are: maintenance of trails; provision of recreational facilities and amenities; and the need for increased awareness of existing recreational resources.



**Trail Maintenance on the  
Goding Trail Bridge  
(Rattlesnake Gutter Trust)**

According to the 2019 Open Space Survey, the most popular recreational resources in town are:

- 1) Rattlesnake Gutter area trails (85%)\*
- 2) Trails maintained by the Leverett Trails Committee (81%)\*
- 3) Leverett Pond (67%)
- 4) Roadsides (walking running, biking) (65%)
- 5) New England Peace Pagoda (62%)
- 6) Mt. Toby Trails (56%)
- 7) Teawaddle Hill Farm, Gordon King Property, 4-H Forest, Woodard's Corner (54%)\*
- 8) Cave Hill Conservation Area (47%)\*
- 9) Robert Frost Trail (45%)
- 10) East Leverett Meadow (44%)\*

*\*Denotes properties with trails maintained by the Leverett Trails Committee. The Leverett Trails Committee maintains trails on properties owned by the Town, owned by the Rattlesnake Gutter Trust, and on private properties with conservation restrictions or other formalized trail easements. The Leverett Trails Committee is a volunteer group cosponsored by the Rattlesnake Gutter Trust and the Conservation Commission.*

With all of the many outdoor recreational resources available in Leverett, the Open Space Committee wanted to know if the awareness of these resources should be improved amongst residents. In the 2019 Survey, respondents were asked to mark what they thought the best mechanisms for improving awareness should be. A large majority (82%) of respondents support installing way-finding signs to these amenities. Many respondents (67%) also suggested that using the town website and online social media would be effective ways to increase awareness of the recreational resources that exist in town.

Almost all respondents (82%) felt that the existing amenities in Leverett are in good condition. Many respondents commended the Trails Committee on the excellent work they do in maintaining the many miles of trails in the community. Because many survey respondents said that they like to walk, run, and bicycle in town; it is not surprising that there was a desire for the roadways to be more friendly to pedestrians and bicyclists. Improving and expanding access to Leverett Pond is also a top priority for the town and was noted by many respondents in the Leverett Open Space and Recreation Survey.

Town land may be needed in the future for recreational facilities (such as land for park and playground facilities) and for improved access to a network of recreational trails. There are roughly 560 acres of open space owned by the Town of Leverett. It would be important to determine if the potential future uses of these parcels might include amenities, such as parks, playgrounds, or sports fields, if needed. If parcels were to be developed as parks or playgrounds, they should be accessible to the physically handicapped and the elderly. Leverett is interested in pursuing the construction of accessible walking trails, potentially located near the elementary school. Survey respondents also have suggested that in addition to the development of recreational trails, another potential future use could be a children's playground that is nature-based and hands-on. An example of such a playground is the City of Ithaca's Hands-on-Nature Anarchy Zone in its Ithaca Children's Garden.<sup>1</sup> Another project that has been gaining momentum in Town is a synthesis of these ideas: the creation of an accessible walking trail dotted with nature-based fitness stations (similar to parcourses popular in Europe).

When planning for the recreational needs of a community, all age groups and populations need to be considered. As the population of Leverett continues to age, as is the trend in Leverett and throughout the country, there may be more pressure placed upon the town to provide open space and recreational activities for older citizens. Any future development of land or facilities for open space and recreation should include careful consideration of access for older citizens, as well as for the disabled. These needs should be also addressed as a matter of course under ADA requirements.

Because the Town of Leverett is a member of the Amherst-Pelham Regional High School, much of the programming and activities for teens are provided through the school district, rather than Leverett itself. There are private programs located in or near LEverett that focus on the recreational needs of teens in the region. These include the Morse Hill Outdoor Education Center in Shutesbury and the Wolf Tree Programs in Montague.

### **C. MANAGEMENT NEEDS**

Leverett is fortunate to have a great number of organizations interested in the environment in and around the community. There are a number of federal, state, and regional environmental organizations sponsoring land and natural resource protection

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<sup>1</sup> <https://ithacachildrengarden.org/visit-the-garden/about-the-garden/hands-on-nature-anarchy-zone/>

projects including the Rattlesnake Gutter Trust, Mount Grace Land Conservation Trust, Franklin Land Trust, the North Quabbin Regional Landscape Partnership, University of Massachusetts-Amherst, Massachusetts Audubon Society, Trustees of Reservations, New England Forestry Foundation, Harvard University, U.S. Army Corps of Engineers, and various state agencies (Department of Conservation and Recreation, Division of Fisheries and Wildlife, Department of Agricultural Resources,). The Conservation Commission will continue to work with these organizations on land protection projects in Leverett. Additionally, there may be a need for the town to have the ability to facilitate and coordinate the activities that occur within Leverett so that they most benefit local residents and ecosystems. An appointed Open Space Committee could be given the responsibilities to act as the liaison to these organizations reporting back to town officials as necessary. Similarly, if town officials are kept abreast of these local and regional efforts, there would be more opportunities for cooperation with adjoining towns.

How a community chooses to spend its fiscal resources is often decided at Town Meeting. However, in many communities the warrant articles prepared ahead of time are often the result of policy discussions among boards and a small proportion of the total population. A major obstacle to implementing the recommendations of this Open Space and Recreation Plan will be the effective coordination of all town boards and commissions in a manner that promotes communication and discussion of open space and recreation issues between boards and among the general public.

# SECTION 8

## GOALS AND OBJECTIVES

The following goals and objectives were formulated from the results of the 2019 Leverett Open Space and Recreation Planning Survey and reviewed and modified through the public meetings of the Open Space Planning Committee, the public forum process, and associated public comment. All of the goals and objectives will be pursued and implemented within the context of increasing and strengthening Leverett's resiliency to climate change.

### **Goals and Objectives**

#### Goal 1: Preserve the Rural Character of the Town

- a. Preserve historic and cultural resources including historic landscapes, homes, mills, and cemeteries.
- b. Explore various zoning options for managing growth and enact appropriate measures.
- c. Establish and enforce restrictions on roadside shade tree removal.

#### Goal 2: Protect and Preserve Natural Resources

- a. Assess major wildlife core habitats (including vernal pools), riparian corridors, wildlife corridors, core habitats, significant soil types, and scenic vistas to determine priority areas to protect and enhance.
- b. Pursue ways to protect and enhance identified priority protection areas.
- c. Assess critical water resources and strengthen their protection.
- d. Assess ways to increase the town's resiliency with respect to climate change

#### Goal 3: Improve and Maintain Public Education Related to Open Space

- a. Develop and make available trail maps/guides/signage to Leverett's trails, open space, recreation areas (ex. hiking, cross-country skiing, mountain biking, etc.) and historic landscapes.
- b. Maintain public informational space at Town Library and provide online resources.
- c. Continue to organize trail hikes on town trails.



Goal 4: Promote wide recreational usage of Leverett's natural and cultural resources

- a. Continue to work with the Leverett Pond Committee to increase recreational use of Leverett Pond (ex. for swimming, fishing, boating, skating, and birding).
- b. Expand trails around town to increase their interconnections and promote the community's natural and historic resources.
- c. Improve access to open space for all residents.
- d. Pursue Complete Streets improvements on the town's roadways to more safely accommodate pedestrians and bicyclists.



**Informational Kiosk at the Bill Rivers Conservation Area  
(Rattlesnake Gutter Trust)**

# SECTION 9

## SEVEN – YEAR ACTION PLAN

The Seven-Year Action Plan fulfills the Open Space and Recreation Plan objectives. The objectives address open space, natural resources, recreation, and community development needs because the quantity and quality of accessible open space relates directly to the state of Leverett’s environment; the town’s recreational opportunities; and the quality of future development in Leverett.

The objectives are listed in the far left column of Table 9-1 and are followed in the same row by recommended actions, responsible board or group, start date, and potential funding sources. By implementing the recommended actions, each objective will begin to be realized.

Implementing the Open Space and Recreation Plan will not only require the participation of the Open Space Committee, but it will also necessarily involve many other town groups, including: the Select Board, Planning Board, Zoning Board, Highway Department, Board of Health, Conservation Commission, Recreation Commission, Community Preservation Committee, and the Historical Commission. In addition, the Rattlesnake Gutter Trust is listed as an active and necessary partner in this Action Plan.

Many of these actions may be constrained by a lack of volunteer time, in addition to funding limitations. Where money is required, such as to permanently protect open space, it does not have to be provided by the town alone. State and federal governmental agencies, private non-profit conservation agencies, and foundations are potential sources of funding. These sources are more likely to invest in land protection projects that have a broad base of community support.

A successful Open Space and Recreation Program, under the primary stewardship of an Open Space Committee, can achieve all of the action steps listed below over time. However, it will be important to establish priorities for the first seven years. The Open Space Planning Committee has prioritized action steps by the goals and objectives listed in the previous chapter. These action steps are represented graphically (where possible) on the Seven-Year Action Plan Map and are outlined in greater detail in Table 9-1.



View of Leverett Pond (Rattlesnake Gutter Trust)

**Table 9-1: Recommended Actions of the Open Space and Recreation Plan**

OBJECTIVE	ACTION	RESPONSIBLE BOARD/GROUP	START DATE	POTENTIAL FUNDING SOURCES
<b>GOAL 1: Preserve the Rural Character of the Town</b>				
Preserve historic and cultural resources including historic landscapes, homes, mills and cemeteries.	Implement recommendations of the 2018 <i>Leverett Veteran’s Recognition Project Assessment Report</i> , which examined the conditions of the cemeteries in Town.	Historical Commission, Community Preservation Committee	2021	Town funds, State funds, Private funds, CPA funds
	Implement the recommendations of the 2018 Preservation Planning Report based on the 2017-18 Historical Assets Survey.	Historical Commission, Community Preservation Committee, Planning Board	2022	Town funds, State funds, Private funds, CPA funds
Explore various zoning options for managing growth and enact appropriate measures.	Explore the use of agricultural zoning, cluster zoning, wetland protection bylaws, Low Impact Development (LID) bylaws, and water supply protection bylaws, and floodplain management regulations.	Planning Board, Zoning Board of Appeals, Conservation Commission	2021	Town funds, State funds
Establish restrictions on roadside shade tree removal.	Create a Tree Ordinance that provides guidance for the planting, caring for, and removal of trees within the public right-of way.	Planning Board, Highway Department, Conservation Commission	2024	Town funds
<b>GOAL 2: Protect and Preserve Natural Resources</b>				
Assess major wildlife core habitats (including vernal pools), wildlife corridors, riparian corridors, core habitats, significant soil types, and scenic vistas to determine priority areas to protect and enhance.	Use GIS tools (such as MAPPR from Mass Audubon) and field assessments to prioritize areas for protection.	Conservation Commission	2020	Town funds

<b>OBJECTIVE</b>	<b>ACTION</b>	<b>RESPONSIBLE BOARD/GROUP</b>	<b>START DATE</b>	<b>POTENTIAL FUNDING SOURCES</b>
Pursue ways to protect and enhance identified priority protection areas.	Place Conservation Restrictions on Rattlesnake Gutter lands and town-owned Conservation Areas for permanent protection.	Rattlesnake Gutter Trust, Conservation Commission	2020	Private funds, CPA funds
	Work with the Town, private landowners, and state agencies to protect parcels in the Stoddard Hill area to connect state-owned parcels and protect NHESP Priority Habitat of Rare Species	Rattlesnake Gutter Trust, Conservation Commission	2020	State Funds, Towns Funds, CPA Funds
	Explore the tax title process for the town to formally acquire lands to be protected.	Planning Board, Select Board, Conservation Commission	2021	Town funds
	Set aside protected lands for wildlife that limit or prohibit active and/or passive recreation.	Select Board, Conservation Commission, Rattlesnake Gutter Trust	2022	Town funds
Assess critical water resources and strengthen their protection.	Investigate ways to mitigate the use of road salt in the winters.	Highway Department, Conservation Commission	2023	Town funds
	Conduct a town-wide drinking water study to map groundwater sources and potential vulnerabilities, including septic systems.	Conservation Commission, Select Board, Zoning Board, Planning board, Board of Health	2025	Town funds, State funds
Assess ways to increase resiliency due to climate change.	Become a MVP certified community and implement recommendations from the MVP planning process.	Select Board, Planning Board, Board of Health, Conservation Commission, Highway Department	2020	Town funds, State funds

OBJECTIVE	ACTION	RESPONSIBLE BOARD/GROUP	START DATE	POTENTIAL FUNDING SOURCES
<b>GOAL 3: Improve and Maintain Public Education Related to Open Space</b>				
Develop and make available trail maps/guides/signage to Leverett's trails, open space, and recreation areas (ex. hiking, cross-country skiing, mountain biking, etc) and historic landscapes.	Install wayfinding signage, information kiosks, and other amenities at trailheads, parking lots, and other facilities. Create parking facilities at trailheads, when feasible.	Conservation Commission, Rattlesnake Gutter Trust, Trails Committee, Historical Commission	2021	Town funds, Private funds, State funds
	Create GIS-based maps for existing recreational resources (hiking, skiing, fishing, etc.) within town to be published in print and/or online.	Conservation Commission, Rattlesnake Gutter Trust, Trails Committee, Historical Commission	2024	Town funds, Private funds, State funds
Maintain public informational space at Town Library about recreation, open space, historical resources in Leverett and establish online resources.	Work with Library to create an informational space and supply educational materials. Post information on town website.	Conservation Commission, Historical Commission	2021	Town funds, Private funds
	Make resources available to landowners about the benefits and options of private stewardship of land (ex. information about landowner liability for trail usage, tax options, etc.).	Conservation Commission, Rattlesnake Gutter Trust	2021	Town funds, Private funds,
	Distribute informational resources about ecological land stewardship to residents.	Conservation Commission, Rattlesnake Gutter Land Trust	2021	Town funds, Private funds
Continue to organize trail hikes on trails in town.	Create themed hikes throughout the year on trails in town.	Conservation Commission, Rattlesnake Gutter Trust, Friends of Leverett Pond, Trails Committee	Ongoing	Town funds, Volunteer Time

OBJECTIVE	ACTION	RESPONSIBLE BOARD/GROUP	START DATE	POTENTIAL FUNDING SOURCES
<b>Goal 4: Promote wide recreational usage of Leverett's natural resources</b>				
Continue to work with the Friends of Leverett Pond to increase recreational use of Leverett Pond (ex. for swimming, fishing, boating, skating, and birding).	Continue to implement Nuisance Aquatic Plant Management Plan.	Conservation Commission, Friends of Leverett Pond	2023	Town funds, Private funds, State funds
	Make kayaks available for public use at Leverett Pond.	Recreation Committee, Friends of Leverett Pond	2020	Town funds, Private funds
Expand trails around Town to increase interconnections and promote the community's natural resources and historic landscapes.	Continue to explore possibility of creating a trail around Leverett Pond and to increase the accessibility to the Pond.	Conservation Commission, Friends of Leverett Pond, Trails Committee, Historical Commission	2025	Town funds, Private funds, State funds
	Work with willing private landowners to establish trails to connect public conservation areas and historic resources.	Conservation Commission, Rattlesnake Gutter Trust, Historical Commission	2021	Town funds, State funds
Improve access to open space for all residents.	Create an ADA accessible public trail that all residents could use, either at the Elementary School or in other locations.	Conservation Commission, Trails Committee, Recreation Committee	2020	Town funds, State funds.
	Improve accessibility to existing resources by implementing recommendations of the 2018 ADA Self-Evaluation & Transition Plan.	Conservation Commission, Trails Committee, Recreation Committee, Select Board	2020	Town funds, State funds
Implement Complete Streets improvements on roadways to more safely accommodate pedestrians and bicyclists.	Participate in the MassDOT Complete Streets funding program.	Select Board, Highway Department	2020	Town funds, State funds

Implement the recommendations of the 2018 Preservation Planning Report based on the 2017-18 Historical Assets Survey.

Work with the Town, private landowners, and state agencies to protect parcels in the Stoddard Hill area to connect state-owned parcels and protect NHESP Priority Habitat of Rare Species

Place Conservation Restrictions on Rattlesnake Gutter lands and town-owned Conservation Areas for permanent protection.

Work with Library to create an informational space and supply educational materials.

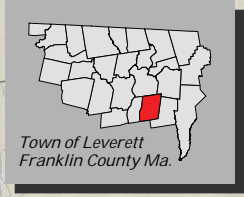
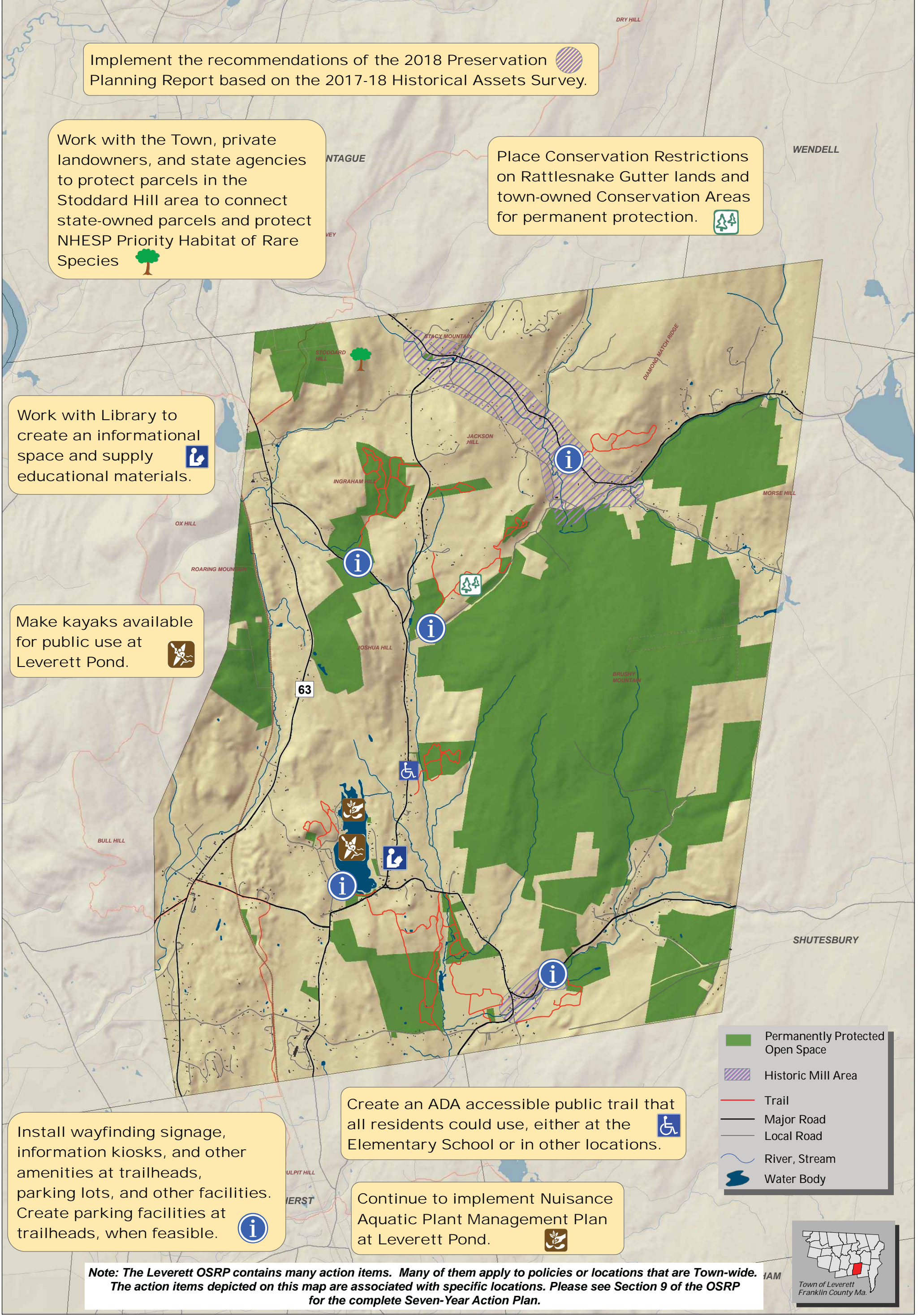
Make kayaks available for public use at Leverett Pond.

Install wayfinding signage, information kiosks, and other amenities at trailheads, parking lots, and other facilities. Create parking facilities at trailheads, when feasible.

Create an ADA accessible public trail that all residents could use, either at the Elementary School or in other locations.

Continue to implement Nuisance Aquatic Plant Management Plan at Leverett Pond.

**Note: The Leverett OSRP contains many action items. Many of them apply to policies or locations that are Town-wide. The action items depicted on this map are associated with specific locations. Please see Section 9 of the OSRP for the complete Seven-Year Action Plan.**



# **SECTION 10**

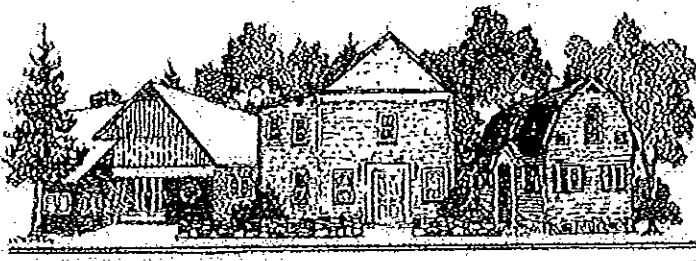
## **PUBLIC COMMENT**

Public feedback, sought throughout the entire open space and recreation planning process, is difficult to document due to the fact that the draft plans constantly incorporated these changes and enhancements. A more direct request for feedback was presented in the public forum, which was held on May 28, 2019. Comments received during the public forum and the period prior to the forum have all been incorporated into the Plan.

Copies of the final version of the Leverett Open Space and Recreation Plan were sent to the Massachusetts Division of Conservation Services (DCS), the Leverett Select and Planning Boards, Recreation Committee, Conservation Commission, and the Rattlesnake Gutter Trust for comment. Their comment letters are inserted into the plan at the end of this section.

An Open Space and Recreation Plan Public Forum was held on May 28, 2018, at the Town Hall at 6:00 p.m. to obtain feedback about the draft plan and its recommendations. This meeting was held prior to the Select Board meeting. Flyers advertising the meeting were distributed prior to the meeting. Notices about the meeting were also posted on the town website and emailed to all boards and committees. Six residents attended the forum, including members of the following committees: Conservation Committee, Select Board, Historical Commission, Trails Committee, and Council on Aging. At the Forum, there was wide agreement with the draft findings and recommendations. The discussion of the Forum focused on ways to increase access to Leverett Pond and the desire to prioritize the creation of an ADA accessible public trail in Town.





**TOWN OF LEVERETT**  
**Massachusetts 01054**

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May 28, 2019

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Town of Leverett Select Board are writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Select Board, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Select Board have reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

Peter d'Errico, Chair  
Town of Leverett Select Board



**TOWN OF LEVERETT**  
**Massachusetts 01054**

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DATE 6/12/19

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Town of Leverett Planning Board is writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Board of Selectmen, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Planning Board has reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

A handwritten signature in blue ink that reads "Ken Kahn". The signature is written in a cursive style.

Ken Kahn, Chair  
Town of Leverett Planning Board



**TOWN OF LEVERETT**  
**Massachusetts 01054**

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June 3, 2019

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Town of Leverett Conservation Commission is writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Board of Selectmen, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Conservation Commission is heavily invested in the success of the Open Space and Recreation Plan, and is committed to partnering with other town groups to achieve several of its objectives. We have reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

Isaiah Robison, Chair  
Town of Leverett Conservation Commission



# Franklin Regional Council of Governments

May 31, 2019

Ms. Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Ms. Cryan,

The Franklin Regional Council of Governments (FRCOG) is pleased to endorse the work of the Leverett Open Space & Recreation Plan Update Committee in their update of the Leverett Open Space and Recreation Plan (OSRP). We support their submission of the draft 2019 Leverett OSRP to the Massachusetts Division of Conservation Services for review and approval.

The Plan was developed by the Leverett Open Space & Recreation Plan Update Committee, which included representation from the Town's Select Board, Planning Board, Recreation Committee, Historic Commission, Conservation Commission, and the Rattlesnake Gutter Trust. The FRCOG provided technical assistance to complete the update. The Plan represents two years of work to gather public input, build consensus, and prioritize natural, recreation, and open space needs in Town. The goals and objectives in the Open Space and Recreation Plan reflect the vision and values of Leverett residents gathered during the public input process.

The 2019 OSRP will provide Town officials and volunteers with resources to help inform decisions regarding land use, recreation, cultural, and open space issues. The Plan update, once approved by the State, will make Leverett eligible for funding to implement open space and recreation projects. In addition, the Town will be better able to collaborate with neighboring towns, local land trusts, the FRCOG, and others to work towards the OSRP goals and objectives of protecting and enhancing Leverett's significant natural, cultural, and recreational resources. We congratulate the Town of Leverett on completing this project!

Sincerely,

A handwritten signature in cursive script that reads "Kimberly Noake McPhee".

Kimberly Noake McPhee, P.G., CFM  
Land Use and Natural Resources Program Manager



**TOWN OF LEVERETT**  
**Massachusetts 01054**

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May 29, 2019

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Leverett Council on Aging is writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Board of Selectmen, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Leverett Council on Aging has reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

Teresa Allen

Co-Chair

Leverett Council on Aging



**TOWN OF LEVERETT**  
**Massachusetts 01054**

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8 June 2019

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Leverett Historical Commission is writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Board of Selectmen, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Historical Commission has reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

Susan Mareneck, Chair  
LEVERETT HISTORICAL COMMISSION



**TOWN OF LEVERETT**  
**Massachusetts 01054**

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DATE

Melissa Cryan  
Executive Office of Energy and Environmental Affairs  
100 Cambridge Street, 9<sup>th</sup> Floor  
Boston, MA 02114

Dear Melissa Cryan,

The Rattlesnake Gutter Trust is writing this letter of support for the revised Open Space and Recreation Plan prepared by the Open Space and Recreation Plan Update Committee with the administrative support of the Franklin Regional Council of Governments (FRCOG). The Committee composition provides representation from the Board of Selectmen, Recreation Committee, Conservation Commission, Historical Commission, Planning Board, and the Rattlesnake Gutter Trust. Each representative provides a unique perspective to help develop a comprehensive plan that will meet the recreational and open space needs, challenges, and opportunities of our community.

The Committee has thoughtfully conducted a community survey process and reflected on the feedback provided by the citizens of our community. With this information, the Committee spent months reviewing each chapter of the plan, identifying priority action items and goals to achieve within the next seven (7) years. The Rattlesnake Gutter Trust has reviewed the draft Open Space and Recreation Plan that the Committee has prepared and supports its submission to your office for approval.

Respectfully,

Rocky Adriance and Sarah Todd, Co-Chairs  
The Rattlesnake Gutter Trust



*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

Kathleen A. Theoharides  
SECRETARY

Tel: (617) 626-1000  
Fax: (617) 626-1181  
<http://www.mass.gov/eea>

August 26, 2019

Megan Rhodes  
Franklin Regional Council of Governments  
12 Olive Street, Suite 2  
Greenfield, MA 01301-3351

Re: Open Space and Recreation Plan

Dear Ms. Rhodes:

Thank you for submitting Leverett'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 Leverett to participate in DCS grant rounds through July 2026.

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

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