TOWN OF LEVERETT, MA

2010 Open Space & Recreation Plan Update

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SECTION 1: PLAN SUMMARY

The *2010 Leverett Open Space and Recreation Plan (OSRP) Update* conveys the priorities and recommendations for outdoor recreation and natural resource protection as determined by Leverett's townspeople and its governing bodies. This update builds upon Leverett's 2005 OSRP through updates and revisions which reflect the current character, needs, and goals of the community. Following guidance of the Open Space and Recreation Planner's Workbook issued by the Massachusetts Department of Conservation Services, the *2010 Leverett OSRP Update* provides three primary functions in consideration of information we have about the natural and cultural resources of the town:

1. Assesses progress on goals/objectives outlined in 2005 OSRP;
2. Reviews the concerns and desires of citizens who responded during the update planning process;
3. Updates objectives for each of the 4 main goals established in the 2005 OSRP;

In preparing this update, the Conservation Commission developed and distributed an assessment mechanism to boards/groups named responsible for the goals/objectives set forth in the 2010 OSRP (Appendix I). Additionally, the Conservation Commission used mail surveys of residents to solicit public opinion (Appendix J).

The authors of this report hope and intend that its findings will be useful to town boards, groups, and committees for making decisions over the next five years about land acquisition, capital planning, acceptable growth patterns, and the implementation of a commonly held vision of Leverett.

SECTION 2: INTRODUCTION

A. Statement of Purpose

The purpose of this Open Space and Recreation Plan Update is to provide a detailed basis for decision-making with regards to current and future open space and recreation needs of Leverett residents. A majority of the towns in the Connecticut River Valley continue to undergo rapid development and growth. Since Leverett is adjacent to the college/university town of Amherst, it experiences considerable development pressure. Mitigating against potentially adverse effects of growth requires long-range planning to protect Leverett's important natural and cultural features, including:

- High quality ground and surface waters, e.g. aquifers, wetlands
- Critical habitat lands
- Prime farmland soils
- Unique geological features
- Scenic and historic landscapes, corridors and roads

Preparation of this update and its five-year action plan coincides with continued efforts by town committees and residents to address the Community Preservation Act and the state-mandated Community Development and Preservation Plan.

Leverett began to set policies for regulated growth with adoption of a set of by-laws in 1959. These by-laws have been amended nine times since 1967 in response to needs that include protecting streams and lakes, establishing flood hazard districts to minimize potential flood damage, and regulating development of housing subdivisions to maintain the natural characteristics of the town. Long-range planning is particularly important to Leverett because most of the prime building sites (those with favorable soil

conditions, topography, and water supplies) are already occupied. Leverett has no public water supply or sewage disposal system. Using modern technology, each building lot must be suitable for these needs. The number of new homes will ultimately depend on the number of building lots with soils suitable for an adequate septic system and water supply.

After establishing a common agreement about town goals, Leverett will be able to regulate growth while maintaining its rural character. The Conservation Commission offers this plan update to continue facilitating that process.

B. Planning Process and Public Participation

This *2010 OSRP Update* builds primarily on the 2005 OSRP. Supporting materials include earlier planning documents such as: *Natural Resource Inventory* prepared by the Franklin County Natural Resources Team (1971); *Where We Stand: A Report of Leverett's Planning Process (*1973); *Growth Management Report For Deerfield, Leverett, and Sunderland* (1986); the *Conservation and Outdoor Recreation Master Plan* released in 1990; the *Cost of Community Services in Southern New England* (1995); the *Leverett Community Development Plan* (2004); and the *Town of Leverett 2009 Annual Report*.

In preparing to conduct this update, Leverett's Conservation Agent submitted a proposal to the Conservation Commission, defining the following objectives, methods, and evaluation that would result from the update process:

Objectives:

1. Assessment of "Actions" taken on 2005 OSRP Goals.

2. Development/Implementation of detailed Action Plans to address unmet Conservation Commission goals where feasible
3. Outreach to other Responsible Boards/Groups in Assessment/Action Plan development and implementation
4. Coordinate draft of the official 2010-2015 Open Space and Recreation Plan Update.

Methods:

1. Assessment of actions already taken will occur through:

A. Correspondence with the "Responsible Board/Groups"

B. Creation of a database categorizing the Goals & Actions (including degrees of completion, products, and resources utilized)

2. Correspond with other Responsible Boards/Groups in implementation of Action plans will be on a case by case basis, and will depend on staffing, funding, and timing parameters.

3. Development/Implementation of unmet goals will focus primarily on Goal 2, Goal 3, and Goal 4 as assigned to the Conservation Commission. Although methods will vary depending upon the specific actions, it can be assumed that the following methods/tools/agencies/regulations will be utilized:

- Open Space & Recreation Planner's Workbook: Appendix D (Appendix 10)
- The Massachusetts Wetlands Protection Act (M.G.L 131, § 40 and regulations 310 CMR 10.00)
- Massachusetts Endangered Species Act (M.G.L. 131A and regulations 321

CMR 10.00)

- Mass Fish & Wildlife Service "Guidelines for the Certification Of Vernal Pool Habitats 2009"
- GPS/GIS Mapping Technologies
- Results of Leverett's DCR Forest Stewardship Plan

4. Coordination of the plan update will follow the guidelines as set forth in the DCS's Open Space and Recreation Planners Workbook Appendix D. "Preparing an Open Space and Recreation Plan Update."

To solicit information for this plan update, a survey focusing on open space and outdoor recreation was mailed to each household throughout the town in the spring of 2010. In addition, representatives of the boards/groups, commissions, and committees were provided with an assessment mechanism intended to define which actions listed in the 2005 OSRP were taken over the past five years. This assessment mechanism also served to define which goals each board group planned to continue working on, as well as to solicit any new actions or goals said bodies have developed.

While many townspeople contributed to this planning document and it's predecessors, certain individuals had major roles: Bill Rivers, Don Progulske, Steve Weiss, Libby Hopkins, Steve Roof, and the following members of the 2010 Conservation Commission David Powicki-Chair, Chris Nelson-Vice Chair, Ralph TIner, Laurie Brown, Nicki Robb, Andrew Young, and Victoria Cliché, and Conservation Agent/Update coordinator Joshua Surette. Michael Barry, Mary Alice Wilson and her bird watching group. A special thanks goes to Joan Godsey's Fifth Grade Class at Leverett Elementary School for their list of creatures great and small they have seen in town.

SECTION 3: COMMUNITY SETTING

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 and Wendell to the east, Amherst 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-milling, and water-powered manufacturing. In recent times, 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.

B. History of the Community

Beginnings

While the Native American Pocumtuck tribe made forays into Leverett for fishing, hunting and maple sugaring, they did not establish villages. Most records agree that the first permanent settlement 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. Nine faith communities are active in town.

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, and shops supplemented self-sufficient farms in producing goods and services. Abundant waterpower prompted the development of at least thirteen mills along the Sawmill River and its tributaries. Other mills were located on Roaring Brook. Early industry included the production of hoes, scythes, tables, chairs, churns, yarn, and satinet.

In 1900 a box factory operated in the center of town. 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 the largest in the county. Many homes served as inns for travelers.A charcoal industry once thrived on Hemenway Road. In its heyday it produced charcoal for gas mask filters, gunpowder, and insulation during World War II. Remnants of the charcoal kilns are still visible**.**

In the early 1900s, the new railroads, electricity, and the automobile became forces for change in town. World War I also had an impact. Regional activity that had formerly supported self-sufficiency was

gradually rendered unnecessary and impractical by convenient means of transportation and the availability of jobs in the cities and military service.

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. Unconventional, hand-built homes began appearing in town, reflecting divergent life styles. In the 1980s another distinct group—affluent professionals—arrived. Using the 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 prevented the cultural and generational clashes that might have occurred. One was the giant step in 1950 of replacing nine one-room schools scattered around town with a consolidated elementary school. Another was the expansion of the telephone exchange that simplified communication within all parts of the town.

Leverett today is a quietly busy town. Some recent developments reflect the new level of activity: 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). All this activity is centrally located on Montague Road. Many Leverett residents are self-employed in the building and construction trades or in other home-based businesses. The high level of volunteerism on boards and

committees in town government reflects citizen commitment to, and pride in the town.

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.

C. Population Characteristics

Although Leverett was established in 1774, there is little available information on early demographics. 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 1830.

At the time of the writing, 2010 census data was not yet available. The 2000 census provides detailed information about the age composition of the town's residents. Approximately 517 people were under age 25, approximately 960 were between ages 26 and 64, and 186 were 65 and older. Enrollment in the elementary school in 2004 was 140. Within the next decade there will be a substantial increase in the number of residents reaching senior citizen status and retirement.

The average household size was 2.58 persons. The family category of "married couple" accounted for 58.5% of all households, followed by non-family households representing 29%. The median household income was $63,203. The per capita income was $31,891. Of the 648 housing units in Leverett as of 2001, 81% were owner-occupied. The median value of occupied units was $176,900. Of particular note is that more than 50% of the homes (346) were built since 1970.

Of the 933 employed persons, 455 worked in the services sector, followed by trade (65), construction (75), and manufacturing (51). About 105 persons worked at home in Leverett. Most employed Leverett residents commute an average of 15-20 minutes to the Amherst-area labor market (in particular to the University of Massachusetts, the region's largest employer).

D. Growth and Development Patterns

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 eighty-two percent are single-family homes according to the 2000 Census. 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.

From 1981 to 1985, fifty-two single-family homes were built in Leverett; twenty-six in 1985. Between 1994 and 2001, an average of seven to eight houses was built each year, with a low of three and a high of eleven. A building lot selling for $100,000.00 or more is not uncommon.

Zoning (Figure 8: Zoning Map)

The Leverett zoning by-laws were completely revised in 1991; they contain many provisions designed to promote and maintain open space. The town is divided into four main districts (Table 1) with four additional overlay districts. Lot frontage and area range from 150 feet and 40,000 square feet to 450 feet and 120,000 square feet. Two-family structures require a fifty percent addition to the frontage and acreage requirements within their respective districts.

Table 1. Distribution of Land by Zoning District.

Zoning District	**Area** (acres)	**Percent of Town**
Residential/Village	865.41	8.21%
Residential/Rural	9,607.65	91.13%
General Business	28.82	0.27%
Commercial	41.33	0.39%
Total	10,543.21	100.00%

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. These are the Flood Hazard District, Stream and Lake Protection District, and the Scenic Roads Protection District.

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. In addition, the Planning Board recently changed the regulation for frontage in an APP to five hundred feet plus an additional one hundred feet for each lot over three.

There are currently two conventional subdivisions and one APP in Leverett. A preliminary plan has been submitted for another APP consisting of 6 lots on 80 acres. Laurel Hill, a traditional subdivision, has provided about 100 acres of common land protected by conservation restriction.

Private Water Supply

The water supply for all of Leverett's homes is provided by wells or springs. Some of the older wells are shallow but continue to function satisfactorily. Most households, however, require deep wells (depths exceeding five hundred feet) 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.

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. In the last five years, many septic upgrades have been accomplished to comply with the law to protect Leverett's water resources.

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 bins for paper, cans, and plastic containers; a waste compactor; sheds for used motor oil, "take-it-or-leave-it" articles, and a book exchange; and a Salvation Army container for clothing. An additional container is kept for large metal items and building materials. Use of the transfer station requires an annual permit ($25) plus payments for each bag of waste placed in the compactor. Approximately seventy-five percent of Leverett households use the station. Other residents hire commercial collectors who deposit their trash in another town's municipal disposal site. Leverett residents can dispose of hazardous wastes at the Amherst landfill once or twice a year. Annually, approximately two hundred tons of recyclable waste and 215 tons of trash are trucked commercially to Springfield, Massachusetts. This accounts for forty-three 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. The Friends of Rattlesnake Gutter Trust also 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, over $37,000 has been collected for that purpose.

Land Use

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 and what may have been meadows are red maple swamps. Depending on one's perspective, reclaimed forest land is the result of either neglect or good fortune.

In 1971 and 1985, the Resource Mapping/ Land Use Information Systems Unit at the University of Massachusetts conducted aerial surveys to determine changing land use patterns in the state. The most recent survey indicates that although Leverett land remains predominantly forested (eighty-five percent), total forest acreage decreased by a small amount (197 acres) since the 1971 survey. During the same period, low-density residential use increased by a similar amount (209 acres). Unfortunately, agricultural uses have declined to five percent of the total land base. Forty-one acres were withdrawn from agriculture during this period.

Agricultural land remaining in Leverett is located mainly along the Sawmill River and Long Plain, Roaring and Doolittle Brooks. Most of the existing farms are part-time operations that grow hay for horses or raise a few head of horses, beef cattle, or sheep and goats. The town no longer has working dairy farms. Horse and sheep farms are the largest livestock enterprises in town. Abandoned farms quickly revert to forest. As a result, Leverett is losing scenic vistas, early successional wildlife habitat, and landscape diversity.

SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS

A. Topography, Geology, and Soils (Figure 9: Geologic Features)

Climate

Except for local, elevation-induced variations, the climate of Leverett is similar to that of Amherst, for which data have been collected for over one hundred years. Annual precipitation has averaged around 43" for the past seventy-five years. February is the driest month (averaging 2.7") and June is the wettest (averaging 3.9"). Snowfall amounts are similar December through March, averaging approximately 11" per month. Total snowfall varies widely from year to year and in different elevations but averages about 48" annually. Average daily maximum temperatures range from near 32 degrees Fahrenheit in late January/early February to about 82 degrees in mid-July. Average daily minimums are from 15 degrees early in February to 60 degrees in mid-summer. The growing season (last frost in spring to first frost in fall) roughly extends from May 8 to October 1 but varies greatly with topography. The long-term average is 146 days.

Topography

The landscape in Leverett is characterized primarily by rolling wooded hills. 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.

Bedrock Geology

Leverett is underlain by metamorphic rocks ranging from 400 to 615 million years old. These rocks are the deformed remains of sediments deposited in shallow seas and subsequently buried between five and twenty miles below the surface, where the rocks are heated to temperatures in excess of 1,000 degrees Fahrenheit and metamorphosed into rock types known as gneiss and schist. These rocks were extensively deformed during the mountain-building events which formed the ancestral Appalachian Mountains over 350 million years ago, caused by the collision of several large continents, including Africa and Europe, with North America. The rocks now exposed at the surface formed the deep roots of these ancestral mountains which were probably once as grand as the Alps or Himalayas. The Connecticut River Valley itself formed between 220 and 140 million years ago, as North America split away from Europe and Africa. The major split formed to the east of Leverett (and eventually became the Atlantic Ocean), but the Connecticut River Valley formed as a secondary "split" also known as a rift basin.

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.

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 *roche moutonnees*) are gentler than their southeast slopes. These hills are polished by the ice on their "upstream" sides and plucked on the "downstream" sides; these actions create 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. The tops of these hills have unusually low soil depths probably because as the ice retreated the hilltops were stripped of soil and left as bald knobs. 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 if the land has formerly been used for agriculture.

The Glacial Retreat

The most fascinating part 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.

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, but 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, whose maximum elevation is also six hundred feet above sea level.

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. Down slope movement of soil and till has probably left hilltops even poorer in soil cover than they were when the glacier left. Glacial outwash surfaces have been dissected by streams, particularly where Long Plain Brook has carved a small gorge in the delta that it formed in 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.

Soils

Leverett soils 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. The USDA Soil Conservation Service prepared "A Soil Survey of Franklin County, Mass." in the early 1950s. The agency (now the Natural Resources Conservation Service) is currently resurveying the county. Once this project is completed, the new maps and interpretations will be useful sources of information for those engaged in natural resource management and planning in Leverett and Franklin County.

B. 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 eighty-five-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, intermittent stream.

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: the Center with the 1845 Town Hall, unofficial town common with the Edna Emerson memorial garden, Post Office, Congregational Church, craft center, old library, and picturesque pond; bustling Moore's Corner with the Leverett Co-op, Moore's Corner Church, historical society building, and the town's only "Mall"; 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.

C. Water Resources (Figure 10: Water Resources)

Leverett's plentiful water resources include numerous rivers and streams, extensive wetlands, and Leverett Pond. Map 3 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, a local bylaw created a Lake and Stream Protection District restricting 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.

Rivers and Streams

While many streams in Leverett flow intermittently during high water periods, there are four perennial streams: the Sawmill River, Doolittle Brook, Long Plain Brook, and Roaring Brook. The Sawmill River flows from Lake Wyola in Shutesbury through North Leverett to the Connecticut River in Montague. The river is once again a spawning ground for Atlantic salmon through the efforts of the U.S. Fish and Wildlife Service and the Massachusetts Division of Fisheries and Wildlife.

Wetlands

The town's wetlands were inventoried by the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) Program in the late 1970s. This survey identified the majority of large wetlands (> five acres) and therefore does not represent a comprehensive inventory of these valuable resources. Based on the NWI maps, there are over six hundred acres of palustrine wetlands and roughly one hundred acres of lacustrine wetlands in Leverett. The latter are associated with Leverett Pond, the town's only lake. The Massachusetts Department of Environmental Protection Wetlands Conservancy Mapping Program has recently completed photo-interpretation of the town's wetlands. This survey is more comprehensive than the federal inventory, making it an excellent tool to guide wetland conservation and management in the future.

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:

- Hemlock and white pine swamps (palustrine evergreen forested wetlands);
- Red maple swamps (palustrine deciduous forested wetlands);
- Deciduous shrub swamps (palustrine deciduous scrub-shrub wetlands);
- Shrub bogs (palustrine evergreen scrub-shrub wetlands);
- Wet meadows (palustrine emergent wetlands with a saturated water regime)

- Marshes (palustrine emergent wetlands with a seasonally flooded to semi-permanently flooded water regime);
- aquatic beds (lacustrine aquatic beds of floating-leaved and submerged plants), and
- vernal pools

Forested wetlands and shrub swamps are dominated by woody species. Besides the major species listed above, forested wetlands may include several other trees (yellow birch, gray birch, green ash, trembling aspen, and swamp white oak), a few shrubs (spicebush, high-bush blueberry, shadbush, chokeberry, and hobblebush), 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, sheep laurel, sweet gale, and buttonbush. The latter two species may occupy large areas. Shrub bogs formed on a substrate of peat moss contain several species including cranberries, leather leaf, 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 (spring-blooming yellow flowers). 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 milfoil has been a problem in Leverett Pond and the focus of intensive management (control) efforts over the past few years.

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 (blue-spotted, spotted, and marbled) and frogs (spring peeper, wood frog, and gray tree frog) and the American toad. The Massachusetts Natural Heritage Program has designated many areas where species of special concern, including some of these species plus others like spotted turtles, have been observed. Such wetlands receive special attention when development is planned in or near these areas. A map showing the general location of these areas is on file at the Conservation Commission and is available for public inspection.

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 land owners (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 the beaver problem.

Leverett Pond

Leverett Pond (formerly called Echo Lake or Fish Pond), is the only natural pond in town. A dam was constructed sometime before 1920, raising the water levels. 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. While the most conspicuous wetland plant in summer may be white water lily, Leverett Pond also possesses numerous other aquatic species including green algae, duckweeds, waterweeds (Elodea), pondweed, bladderworts, mermaid-weed, yellow pond lily, and bur-reeds.

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.

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 milfoil. Eurasian milfoil is the main target of recent aquatic weed control efforts. A species of Potamegeton was discovered recently. Pond management is undertaken by The Friends of Leverett Pond, Inc., 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 milfoil involves application of the herbicide 2,4-D plus selective hand-pulling. This herbicide was applied to less than two acres in 2001. 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 hydro-raking to remove floating mats, applying Rodeo (glyphosate herbicide), and hand-pulling "nuisance species" such as white water lily and water shield. These plants enhance the beauty of the pond (e.g., when lilies are in flower) as well as provide nursery habitat for fishes. However, 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.

Aquifers

The town'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. In 1985, the town of Leverett recognized the importance of these four aquifer drainages by establishing them as aquifer protection districts. The town's zoning bylaw was amended to limit development in these areas.

Floodways

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.

Floodways 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). These adjoining lands are flood hazard zones and they vary in their predicted flood frequency. The 100-year flood zone has a one in 100 statistical probability (or one percent chance) of being flooded in a single year or is predicted to be flooded one year out of a 100-year period; while the 500-year flood zone is based on a 500-year period. Most of the floodways 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 floodways are corridors that pass flowing water downstream, eventually into the Connecticut River.

The National Flood Insurance Program has produced maps that identify floodways across America. The following areas have been designated as floodways in Leverett:

(1) Sawmill River.

(2) 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).

(3) Williams Brook along Richardson Road.

(4) An unnamed tributary ("Dudleyville Brook") to the Sawmill River along Dudleyville Road.

(5) Red Brook.

(6) Long Plain Brook.

(7) 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).

(8) Doolittle Brook (with the floodway beginning about 800 feet south of Rattlesnake Gutter Road.

(9) Leverett Pond, its outlet stream, and an unnamed intermittent stream it connects with ("Dry Run") which eventually joins Doolittle Brook.

(10) Roaring Brook (running westerly, beginning about one hundred feet just east of the crossing at Cushman Road.

D. Vegetation

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. The forest and intermixed agricultural land also provide a visually pleasant landscape. The town's forests are mainly closed-canopied and middle-aged, having a great diversity of species, but no diversity of horizontal or vertical structure. Unfortunately, the only detailed data about Leverett's forests is almost thirty years old. Informal observations, however, lead one to believe that, at the landscape level, little has changed over that time period except that the forests have become older and the trees larger. 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. Interestingly, the town is now eighty-five percent forested.

The town's forests, like all forests in southern New England, have been subjected to a number of disturbances in the past century and pre-settlement times. 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! 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. To this day, residents on Leverett Pond still encounter logs that sank to its bottom. 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.

Other meteorological events that have affected the town's forests are localized microbursts, thunderstorms, and occasional tornadoes such as the one in the 1980s that damaged land along Cave Hill Road. While the area affected by each event is small, the cumulative effect is significant. Major ice storms, such as the one in January 1998, 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. That was not the case in 1921 and 1942 when huge ice storms occurred across Massachusetts. Species with weak wood such as the birches, red maple, and aspen are more easily damaged by ice and wet snow. Species with greater structural integrity such as the 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 all species which 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.

These events 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.

A more drought-resistant community of trees will most likely replace the dead ones.

Besides weather events, insects and pathogens also affect 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. However, that 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 twenty years ago, mortality continues in these

stands as the weakened trees fall victim to secondary pathogens such as shoestring (Armillaria mellea) root rot. 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 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 numbers. Leverett has experienced a total of only forty-five wildfires (consuming 64.5 acres) over the last ten years. Aerial sightings or early detection by the Mt. Toby tower has enabled the Leverett Fire Department, assisted (for larger fires) by 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.

The forests include red maple swamps and oak ridge tops with scattered stands of northern hardwoods, white pine, and hemlock. Much of this forest is considered prime timberland capable of producing in excess of eighty-five cubic feet of biomass per acre per year. As stated elsewhere, Leverett is eighty-six percent forested**.** 5,614 acres are classified under Chapter 61, the Forest Tax Law, and are taxed annually at ten percent of similar unclassified land. Landowners pay to the town an eight percent yield tax on harvested forest products based on the value of the stumpage (standing trees). Participation in this tax deferment program requires the preparation of - and adherence to- a ten-year plan of land management for wood production and related benefits. The program does not guarantee that the land will remain undeveloped, but the landowner has an incentive to keep it in forest use rather than convert it to residential or other such uses because of the reduced tax burden.

Over the last decade, approximately five million board feet of timber and 4,700 cords of fuel wood and pulpwood have been harvested from 2,400 acres scattered throughout the town on tracts averaging 61 acres. Approximately 1,000 of these acres are owned and managed by W. D. Cowls, Inc.; the balance of harvesting in town takes

place on tracts owned by private individuals. The primary benefit of managed forests is the creation of wildlife habitat diversity ranging from young, regenerating stands to older, mature stands. Each developmental stage within the range serves a particular suite of wildlife. The type of forest that now covers most of Leverett supports wildlife species that require more mature forests. Populations of species that require early successional habitats have probably declined in recent years. Notable examples are the ruffed grouse and the cottontail rabbit; many non-game species have also declined. As Leverett's forests mature and increase in value, landowners will intensify their wood product management. Accelerated management can be desirable insofar as it provides a diversity of wildlife habitats and increased resistance to insects and disease.

Those who don't understand that silva-culture actually simulates and enhances the natural forces at work in our forests may view timber harvesting as a destructive process. Some harvesting practices are undeniably disruptive both ecologically and aesthetically but are often the only means of regenerating species such as oak and white pine that require moderate sunlight to reproduce. Sometimes these activities are the only practical means of securing habitat diversity. It is important to note that Massachusetts only produces about five percent of the wood products it consumes. One could argue that producing these products locally where practices are governed by strict regulation is more socially responsible than buying them from other parts of the world where timber harvesting is done with little regard for ecosystem integrity or future productivity. An added benefit of local forestry is increased jobs in an industry that has been part of the rural economy for the last several centuries. Timber harvesting operations are subject to the Massachusetts Forest Cutting Practices Act, administered by the Massachusetts

Department of Environmental Management (DEM). Landowners are required to prepare a plan for approval by a DEM. forester. These plans are designed to mitigate the adverse impacts of forestry practices on the land, especially wetlands and other sensitive areas.

The aim of this discussion is to illustrate that forests are dynamic plant communities that experience severe disturbances or stresses, both "natural" and human-caused, that, over time, have shaped, and will continue to shape, their development.

Public Shade Trees

Leverett is fortunate to have many roads that are bordered by a profusion of shade trees. 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. 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.

E. Fish 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 natural 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 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 (see Appendices B, C, and D respectively). Over one hundred bird species nest here. Many mammals, small and/or nocturnal, are not commonly seen. Occasionally a wandering moose appears in town. Unconfirmed sightings of a mountain lion have been made in recent years. These species lists will probably grow as Leverett

residents and others continue to observe wildlife in our area.

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. An unusual species of freshwater jellyfish was discovered in the pond in 1990. As a result of reintroduction and restoration work by state and federal fish and wildlife agencies, Atlantic salmon are present in small numbers in the Sawmill River.

Core Habitats and Rare, Threatened or Endangered Species

The National Heritage and Endangered Species Program recognizes six 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 as well as one of the state's most viable populations of Autumn Coralroot, a small orchid. Mourning Warblers nest in the shrubby powerline corridors that transect Mount Toby. There are populations of Wood and Spotted Turtles in Long Plain Brook. Small wetlands and the headwaters of Doolittle Brook along the western base of Joshua Hill are home to Marbled and Four-toed Salamanders. Leverett Pond supports the Lesser Bladderwart, an uncommon fresh water plant. For more detailed information on rare and endangered species in Leverett see the BioMap and Living Waters *Core Habitats in Leverett*.

G. Scenic Resources and Unique Environments (Figure 11: Scenic Resources and Unique Environments)

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.

Cultural and historical resources include sites dating from 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 the Amherst Road sugar maples that provide a high canopy tunnel for motorists to drive through, major and minor trails such as the Metacomet-Monadnock and Robert Frost Trails, Mt. Toby trails, and 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. A more detailed list follows.

Historic Sites

Charcoal Kiln

This is a large (24'X 35') charcoal kiln at the junction of Hemenway and Rattlesnake Gutter Roads. There are few such kilns left in New England.

Churches

Three churches date back to the 1800s. The Congregational Church, 1838, in Leverett Center is built on the site of the town's original Meeting House. The

North Leverett Baptist Church in North Leverett, 1835, resulted from a tax revolt by the Baptists, led by Major Richard Montague. The Moore's Corner Church, built in 1896, was a community project.

Lead Mines

There are two lead mines in town, which date from the Revolutionary War. One is located 0.2 miles south of the utility line near Long Hill Road. The other is located 100 yards south of Juggler Meadow Road, about 0.3 miles east of its intersection with Long Plain Road (Rte. 63).

Leverett Crafts and Arts

Formerly the Beaman & Marvel Box Shop, this was one of the two box shops that made locked corner wooden boxes and employed some 50 persons. It is now a widely known craft center.

Mill Sites - Sawmill River

At least 16 mills once operated on the Sawmill River between Lake Wyola in Shutesbury and Route 63 in Montague, 11 of them in Leverett. Moore's Corner has extensive stonework remains at the sites of two important mills**:** one belonging to Alvin Moore at the North Leverett-Dudleyville Road junction, and one belonging to Asa Moore at the junction of Rattlesnake Gutter-Mill Yard Road junction. A former bucket shop and a pail shop, both in North Leverett, have been converted to private homes.

Mill Site - Roaring Brook

Nine mills and shops occurred along one mile of the stream in East Leverett at one time. There were wool, satinet, flannel, and yarn shops, tanneries, blacksmith,

tool and machine shops, gristmill, turning mill, and sawmill. Foundation stonework, canal outlines, and dam remains are evident from 173 Shutesbury Road to the junction with East Leverett Road, where Honeymoon Falls is the site of one of the most recently used mills.

Mill Site - Montague Road

In about 1842, a sawmill was in operation a short distance upstream of the beaver dam off Montague Road. The dam structure and stone foundation remain.

Schoolhouses

Prior to the building of the Elementary School in 1950, elementary education took place in nine one-room schools scattered throughout the town. All but one (Number Six Road) remain today, most having been converted to homes.

Slab-roofed Stone Chamber

At the west end of Rattlesnake Gutter Road there is a stone chamber of unknown origin and date set into the wooded hillside. An unmarked gravestone nearby supports the local legend that this was used as an early family burial tomb.

Sugar Houses

Two of the several sugarhouses in town have historical significance. The Field sugarhouse on Long Plain Road contains many early artifacts, including a tree section with an Indian tap hole. The former Glazier sugarhouse on Rattlesnake Gutter Road is depicted on the Leverett Town Seal.

Town Hall

Built in 1845, this was a one-story building until 1895, when the ladies of the Congregational Church, which used and supported the building, remodeled it.

This consisted of raising the original structure and building what is now the entry, dining area, and kitchen beneath it.

Town Pound

About 100 yards south of the elementary school on Montague Road is a livestock corral built in 1822 to hold stray livestock. This is a remnant from colonial times.

Special Scenic and Recreation Areas

Dudley Brook Bog

This bog is located south of the Dudleyville Road on the Shutesbyr/Leverett border and is unique in town.

Hemenway Road Floral Site

This site is about five hundred feet downstream from the Sawmill River waterfall. Pitcher plants and heath family plants grow in this boggy site.

Honeymoon Falls

This small waterfall and gorge on Roaring Brook could be made more accessible by constructing a trail and a roadside rest area on Cushman Road, one hundred yards downstream.

Kettle Hole Pond

This pond, on the east side of Long Plain Road (Route 63), is 5.3 miles from North Amherst.

Leverett Pond

The pond's primary uses are fishing, boating, bird watching, and swimming.

Long Plain Rest Stop

The rest stop is located on the west side of Long Plain Road approximately 0.25 miles north of the Long Hill intersection. It provides good access for fishing on Long Plain Brook.

Mt. Toby Waterfall

This lovely waterfall on the western border of town is part of the Mt. Toby Demonstration Forest and is accessible by foot trail from Route 63.

Mountain Brook

This stream is in East Leverett on the Shutesbury Road.

Sawmill River Scenic Area

This area is located about 0.3 miles east of Moore's Corner. This lovely quarter-mile section of the river has pools suitable for fishing and wading.

Roaring Brook Picnic Site

This site, located 0.2 miles from the Shutesbury town line on Shutesbury Road, has small waterfalls and numerous pools.

Sawmill River Waterfall

A beautiful waterslide and waterfall is located at the junction of the river and Rattlesnake Gutter Road.

H. Environmental Challenges

To date, Leverett has encountered few serious environmental problems. Three challenges currently facing the town concern Nuisance Aquatic Plant life in Leverett Pond, road salt washing into our wetlands and waterways, ATV use in protected wildlife and wetland areas, and decreasing amount of buildable land.

As discussed earlier (Section 4.C, Water Resources Section), the introduction and spread of the exotic plant Eurasian milfoil has created a problem in Leverett Pond. Currently**,** the town is engaged in an update of the management plan for the pond , spear-headed by a the Friends of Leverett Pond, Inc and the Select Board. Experimenting with various measures, The Friends group has focused on controlling the spread of Eurasian 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 4-2-D followed by the use of hyrdo-rake to remove the treated plant matter.

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. 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 does in fact wash 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.

Another challenge concerns the use of ATV's and especially Jeeps in protected wildlife and wetland resource areas. The Conservation Commission is currently in discussion with the Massachusetts Department of Environmental Protection to discuss what jurisdictional authority municipalities and state agencies have in regulating ATV activity in protected areas. One goal of this dialogue is to discern whether the ATV activity can be regulated under the Mass. Wetland's Protection Act and the Mass. Endangered Species Act, and to codify enforceable ATV regulations in a new town bylaw.

SECTION 5: INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST. (Figure 12 – Protected Open Space)

An estimated 1,630 acres (11.08% of Leverett's total land area} are permanently protected as open space. In addition, 7,034 acres of privately owned land (48% of Leverett's total land area) have temporary protection as open space through an agreement between the current landowner and the state. A complete list of permanently protected lands can be found in Appendix .

More than one hundred individuals and organizations hold ownership of the forests in town. As of December 2003, forty-four owners, representing 5,614 acres (47%), were practicing some form of forest management for timber production and other multiple use benefits. The town, through the Conservation Commission, owns about 160 acres of forest. Eight of the 1,100 acres in the University of Massachusetts' Mt. Toby Demonstration Forest are in Leverett. The Department of Environmental Management owns 90 acres adjacent to the Mt. Toby Forest. Forty-two landowners have classified their land in Ch. 61B (recreation), and many of these 1,040 acres (8% of the town) are also forested. Over half of the forested land in town is under some form of long-term management obligation. Housing development in Leverett will inevitably diminish the average size of private woodland ownership, leading to some inefficiency in management and forest production. These smaller parcels will continue to be managed, but more for aesthetic than economic values

Table 2. Description and Location of some Protected Parcels (Town and Land Trust)

Name	Ownership	Notes	Acreage
4-H Forest Area	Town	Located off Shutesbury Road. Two parcels (35 & 16) acquired by gift in 1964 and 1973, the former from Herschel Abbott, Paul Woodard and the Leverett 4-H Rangers and the latter from the Williams family.	51
Doolittle Brook Conservation Area	Town	Located off Cave Hill Road. Acquired by purchase in 1975.	6
East Leverett Meadow	RGT	Located off Cushman Road. Acquired with the help of Rattlesnake Gutter Trust, several groups and 70 individual contributors.	30
Hidden Acres	RGT	Located on Old Whitney Road. Donation to Rattlesnake Gutter Trust by Hidden Acres residents.	26
Long Hill	RGT	Located off Long Hill Road. Acquired by	38

Natural Area		Rattlesnake Gutter Trust.	
Marvell land	RGT	Located **……...** Acquired by Rattlesnake Gutter Trust.	20
North Leverett Woodlot	Town	Located in North Leverett. Acquired by purchase in 1984.	10
Roaring Brook Conservation Area	Town	Located on Shutesbury Road. Acquired with the help of Rattlesnake Gutter Trust	51
Ruth McIntire Conservation Area	Town	Located on Depot Road. Acquired by gift and purchase in 1987.	56.5
Rattlesnake Gutter Conservation Area	Town	The Town purchases the tract in 1990 with the help of the Friends of Rattlesnake Gutter Trust, the Kestrel Trust, the Wharton Trust and a Self-help grant from the MA Executive Office of Environmental Affairs' Division of Conservation Services.	40
Scheffey Land	RGT	Located on Shutesbury Road; gift of Mr. Scheffey to Rattlesnake Gutter Trust.	16
Spence Lot	Town	Northeast of Elementary School**.**	53
Homes Lot	Town	Located on east shore of Leverett Pond.	< 1
David and Mary	Town	Located on south end of Leverett Pond, west of	1

Field Lot		boat launch.	

B.Private Parcels

Privately owned lands with limited protection Chapter 61 (private forestry lands)

Chapter 61A (private agriculture and horticulture)	380 acres
Chapter 61 B (private recreation)	1,109 acres
Private Lands under Conservation Restriction	107 acres

B. Public and Non-private Parcels

Inventory of Other Public and Private Open Space and Recreation Areas.

- Town Elementary School (16.5 acres) **-** Baseball/softball, basketball, soccer and general play.
- Doolittle Brook Trail – local walking/nature trail behind the school.
- Robert Frost Trail – regional hiking trail that traverses the SW corner of town.
- Metacomet-Monadnock (M&M) Trail – long-distance hiking trail that traverses the entire length of the town from its SE corner to the Montague line**.**

SECTION 6: COMMUNITY VISION

A. Description of Process

Between January and March the Conservation Commission distributed a survey soliciting updated opinions with regards the goals and actions set forth in the 2005 OSRP. Some 865 surveys were distributed -one to each household in Leverett – and 109 (12.6%) were completed and returned. In addition to answering specific questions on the survey, many respondents offered additional comments (approximately 75 in total) on a wide variety of topics. A complete record of the survey results can be viewed in Appendices 4-7. All responses, including verbatim comments may be viewed in copies placed in the Library, Town Hall, and on the Town's website.

B. Statement of Open Space and Recreation Goals

2010 survey data shows that Leveretts' 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, and a variety of outdoor recreation opportunities. Residents value the town's scenic beauty; the clean water of its Great Pond, streams, and wetlands; the large expanses of uninterrupted forest; scattered meadows; diverse wildlife, and peace and quiet. 2010 survey data also suggests that a majority of respondents felt that these town features as well as its stone walls and old foundations, historic sites and buildings, winding dirt roads, and farmland are important and worth conserving.

A future ideal Leverett will have conserved the majority of its uninterrupted forest, the purity of its water and air, and the mosaic of its remaining meadows and

farmland. To do so, the town will increase its education and outreach efforts to better inform residents about land use practices and recreational opportunities in the town. These achievements will enhance wildlife diversity and maintain the simple everyday pleasures of living in a peaceful and beautiful environment. Leverett will also have protected its water resources and preserved and shared the stories of its historic sites and stonewalls. Residents will have easy access to trails and old roads that connect public and private open space.

Pleasant pastimes will continue to include observing nature and unique local landscape features while walking in our various conservation areas; and appreciating the expansive and generous feelings generated by long vistas and unencumbered ridgelines. A sense of community will be sustained by well-attended formal meetings at town centers as well as by casual encounters at the school, library, Post Office, Co-op, and transfer station (Town Dump).

SECTION 7: ANALYSIS OF NEEDS

In addition to ranking 2010 survey topics, respondents made nearly 75 individual comments on a wide range of subjects. Random examples include developing specific recreation opportunities such as swimming and ice skating, while others included general comments and recommendations for more effective management of open space and natural resources, as well as providing townspeople with outreach and education materials. Taken as a whole, these comments provide important insights of our collective state of mind. It is apparent that Leverett residents hold in common both aspirations and vigilant concerns about the future of our town.

Although responses from the 2010 survey generally reflected the goals and objectives set forth in the 2005 OSRP, careful analysis provides an in depth look at what kinds of actions residents would like to see responsible boards and groups take in implementing the OSRP update. Respondents ranked goals and related actions based on the importance categories of "High", "Medium", "Low", and "I Don't Know". The rankings were then converted to percentiles and prioritized in order of importance. In order to extrapolate detailed goals and objectives (see *Section 8 Goals and Objectives*) from these percentages, rankings were compared across subcategories. For example, Table 3. (below) illustrates that Goal 3. "Improve public education concerning recreational opportunities, natural resources, and open space", the subcategory of "Maps/Trail Guides" are of the highest importance (73%) to townspeople, and that "Informational space at Town Library" and "Land-use flyers/pamphlets" are of medium importance (50%).

Table 3: Goal 2. Improve public education concerning recreational opportunities, natural resources and open space

2. Improve public education concerning recreational opportunities, natural resources and open space	Importance to Me			
	High	Med	Low	Don't Know
Maps/trail guides	73%	21%	7%	0%
Outdoor recreational facilities	47%	35%	16%	3%
Newsletters	44%	41%	16%	0%
Group walks/hikes	43%	36%	22%	0%
Public meetings	22%	51%	27%	0%
Signs/kiosks	35%	50%	14%	1%
Informational space at Town Library	27%	50%	19%	5%
Land-use flyers/pamphlets	22%	46%	32%	0%
Public workshops	20%	46%	35%	0%
Town website	37%	42%	22%	0%

A. Summary of Resource Protection Needs

Of Leverett's total land and water area of 14,812 acres, 1,630 acres (11.08%) are permanently protected as open space. Another 7,003 acres (47%) are partially protected through agreements between the state and the current landowner. To date, there is no list of high priority lands or habitat types, nor is there a set of ranking criteria to guide the town's efforts in land protection.

According to the survey, protecting and preserving natural resources and open space is of high importance to the townspeople. In fact *all* categories associated with protecting and preserving natural resources and open space received a ranking of "High" (Table 4)

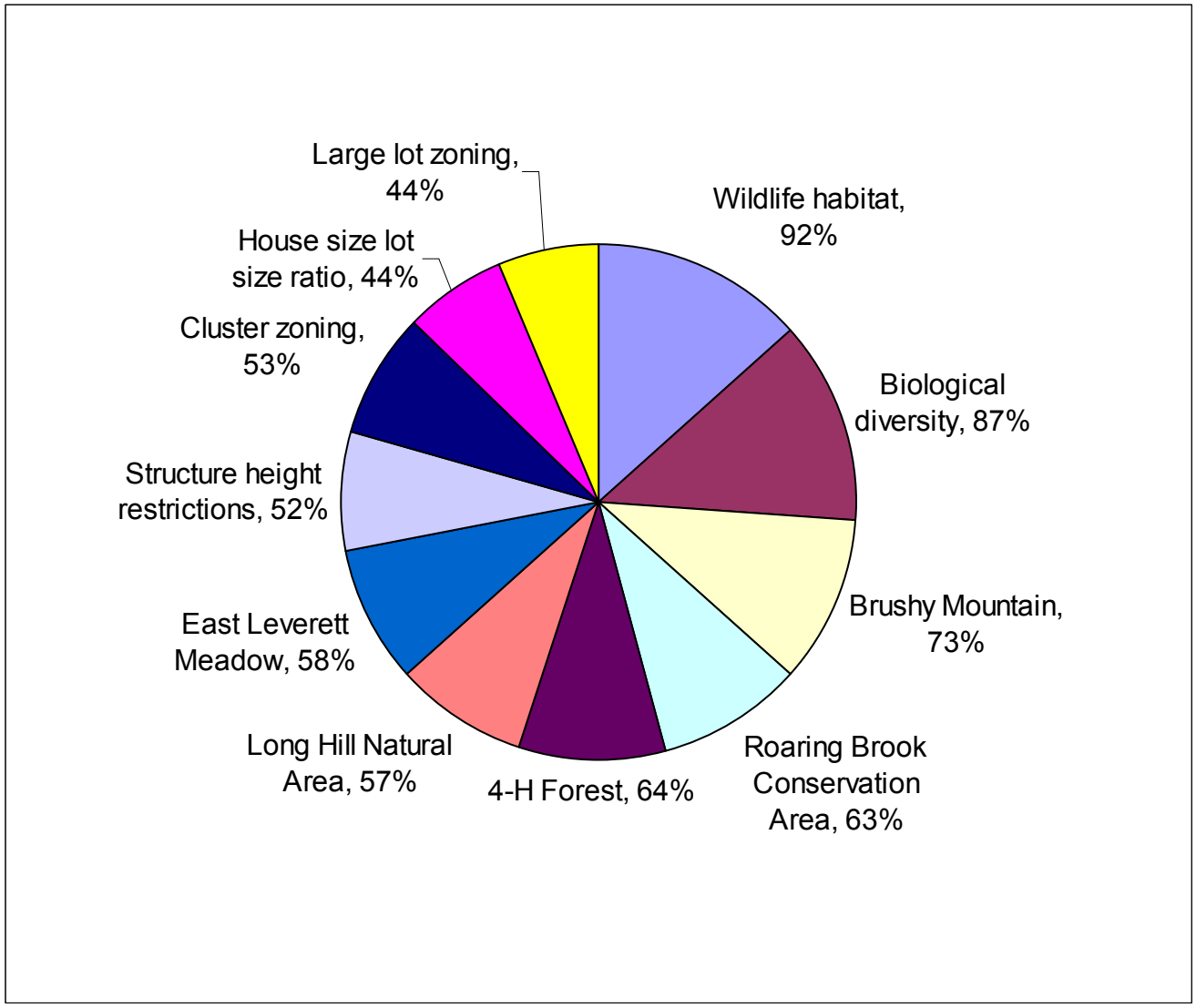

Figure 1. High Importance-Protect and preserve natural resources and open space

Considering the high importance placed on protecting and preserving natural resources and open space, a worthwhile goal for the town to engage in is to develop a ranking scheme for the town's cultural and natural resources, and to generate co-occurrence maps to highlight the areas in which these resources overlap. Doing so will provide the town with focus areas on which to designate funds and energies.

B. Summary of Community's Needs

According to the survey results, community needs are varied but specific. As illustrated in Figures 2 through 6, it is important to note that "importance" was not ranked uniformly across all categories.

Concerning public education, high priorities include "Maps & Trail Guides" (73%), "Outdoor Recreational Facilities"(47%), "Newsletters" (44%), and Group walks/hikes" (43%) (Figure 2)

Public education topics of medium importance include "Signs/Kiosks" (50%), " Informational Space at Town Library"(50%), "Land-use flyers/pamphlets" (46%), " Public workshops"(46%), "Public meetings"(51%), and "Town Website"(42%) (Figure 3).

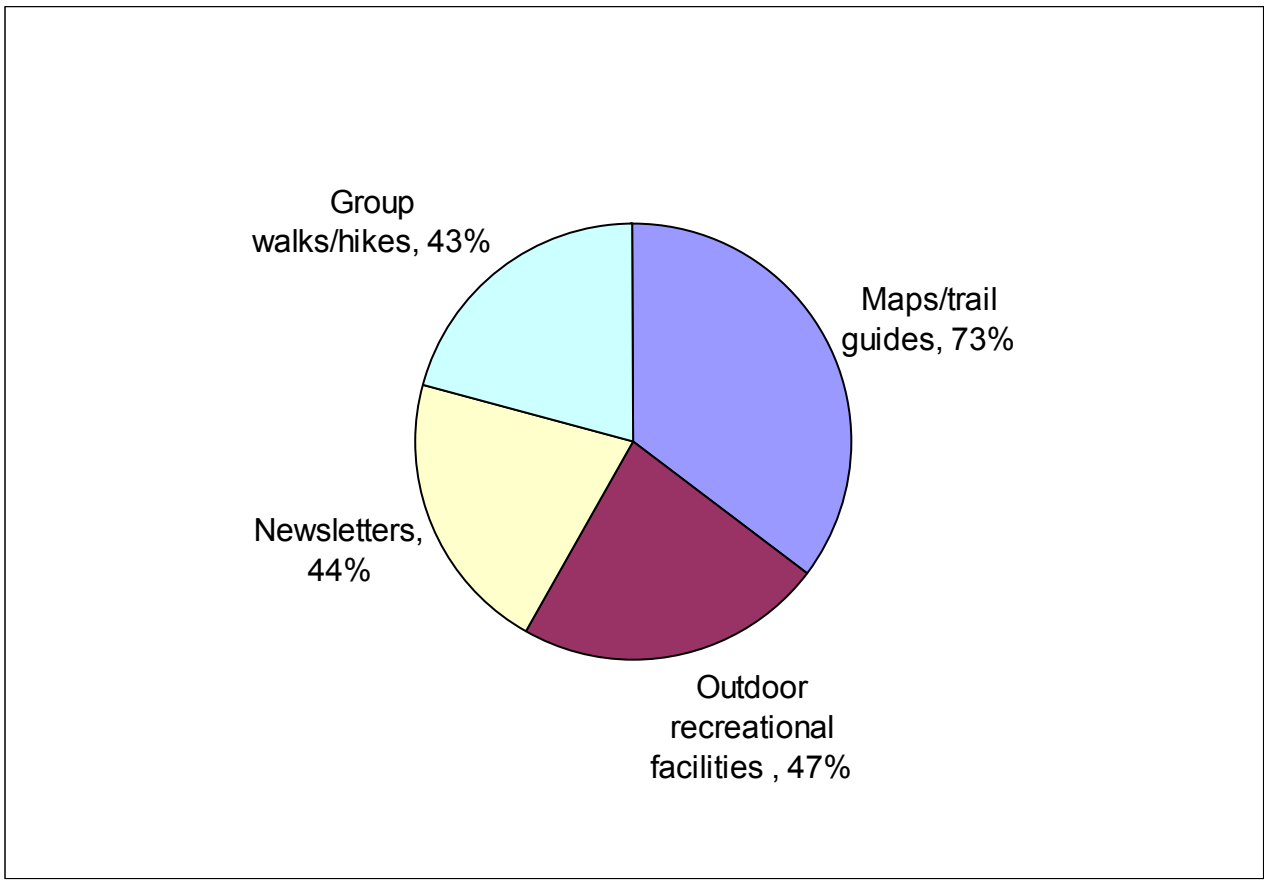

Figure 2. . High Importance-Improve public education concerning recreational opportunities, natural resources, and open space

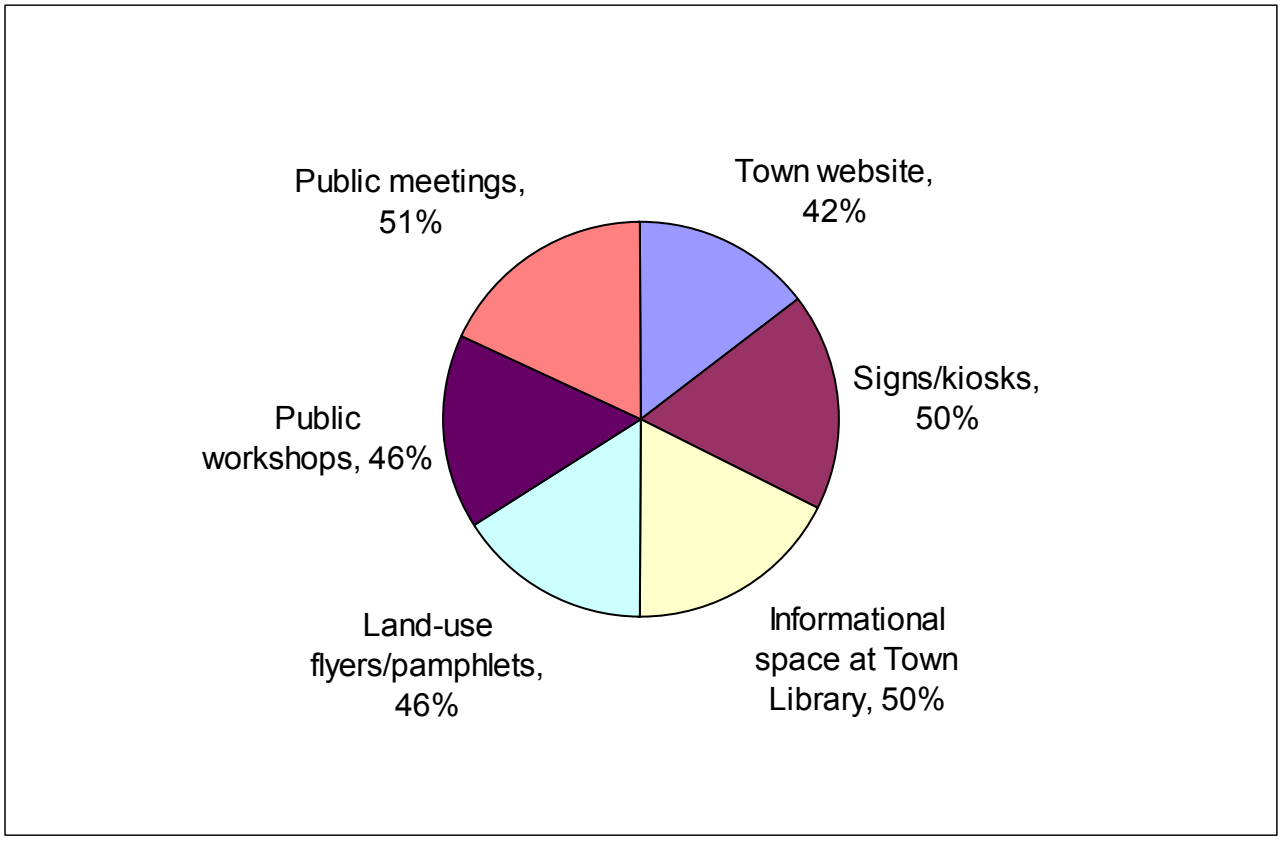

Figure 3. Medium Importance-Improve public education concerning recreational opportunities, natural resources, and open space

Recreation

Most respondents (87%) cited “walking” as their preferred recreational activity. This is an interesting statistic in that it coincides nicely with the “High” importance of “Preserving the rural character of the town “. In fact, nearly all of the highest ranked recreational uses of the town’s natural resources lend to the preservation of Leverett’s rural character. Additional high priorities include “Observe nature” (80%), “Hiking”(76%), “x-country skiing/snowshoeing” (62%), and “Boating” (52%).(Figure 4)

Priorites of medium importance include “Ice skating”(43%) “and Climbing” (41%) (Figure 5).

Low priorities include “Off-road vehicles”(90%), “Snow-mobiling” (85%), “Hunting/fishing” (50%), and “mountain biking”(47%). These are the only subcategories where “low” rankings were the majority (Figure 6)

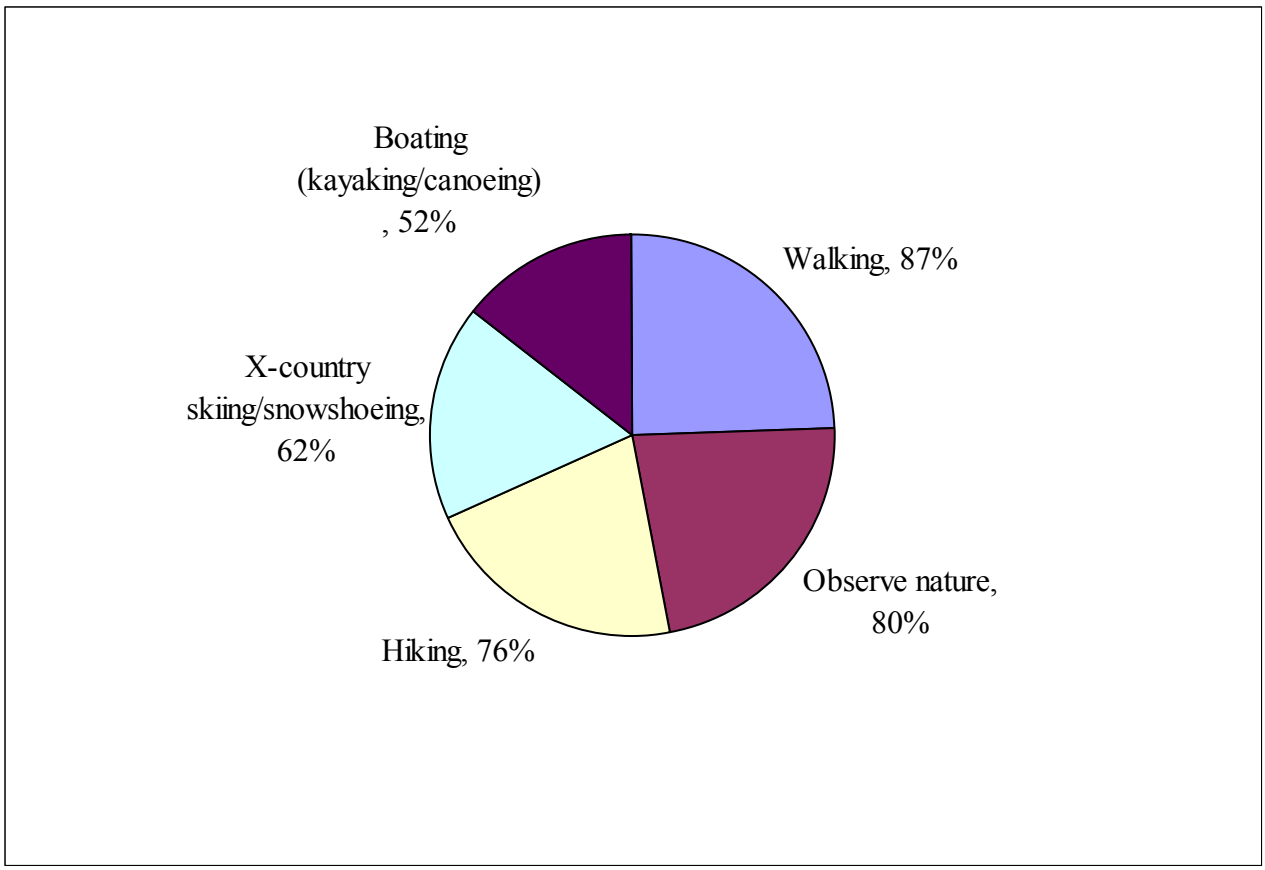

Figure 4. High Importance-Provide wider recreational uses of the town's natural resources

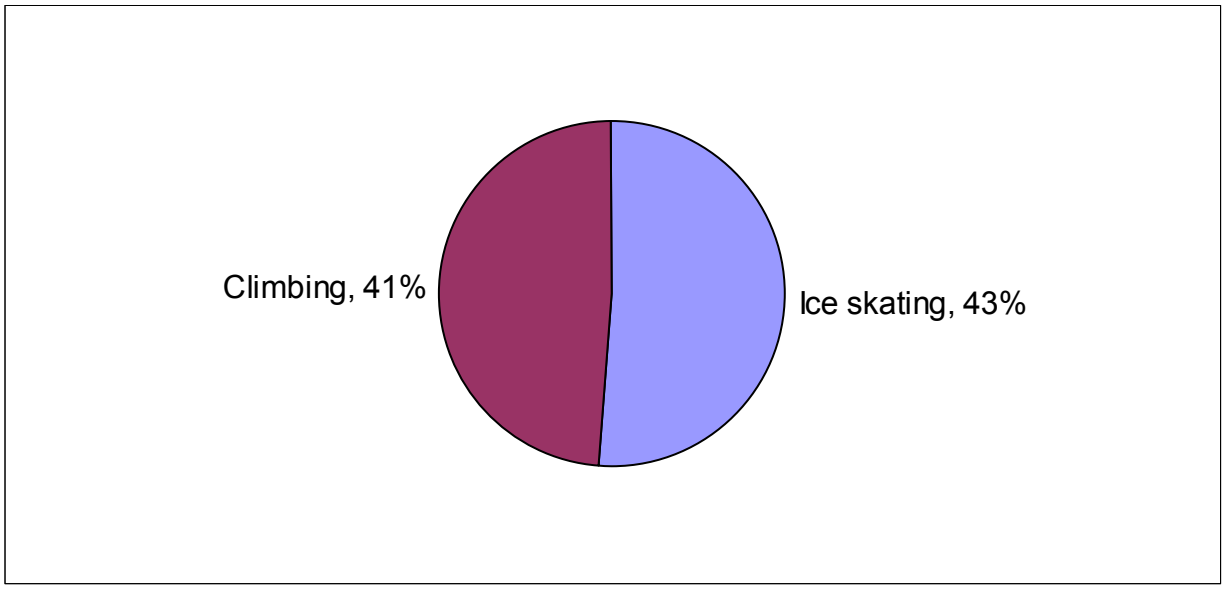

Figure 5. Medium Importance- Provide wider recreational uses of the town's natural resources

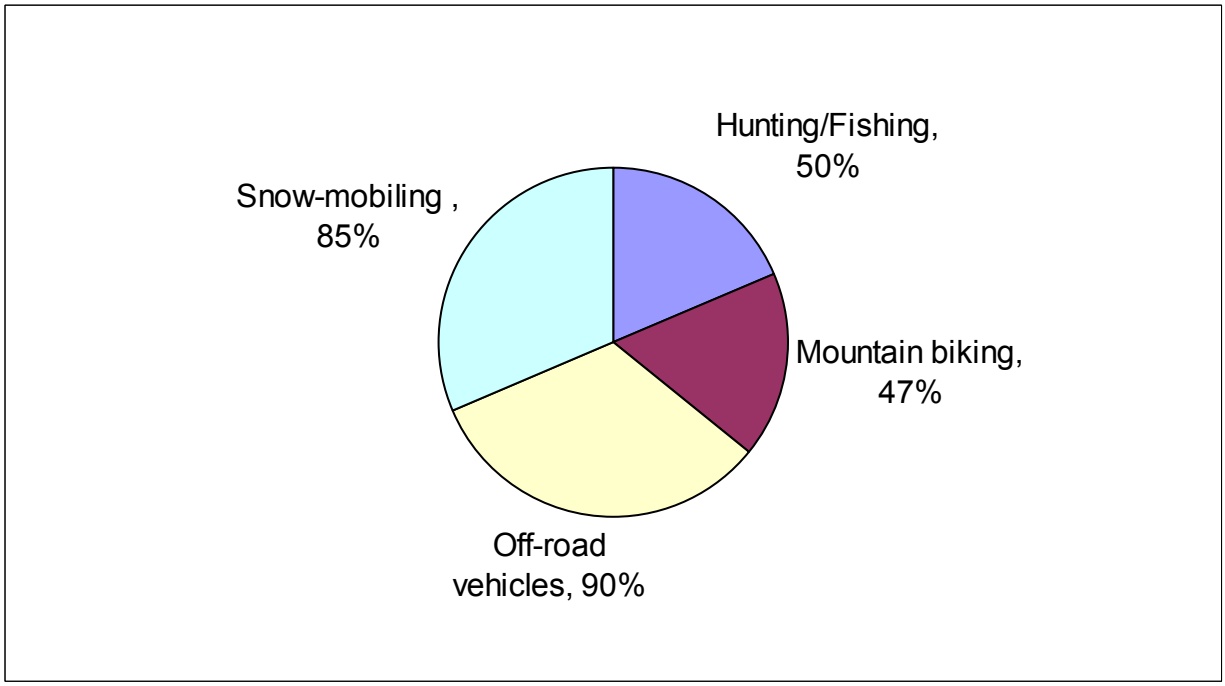

Figure 6. Low Importance-Provide wider recreational uses of the town's natural resources

C. Management Needs, Potential Change of Use

Survey results show that townspeople ranked the preservation of the town's rural character as of the highest importance (Figure 7). In fact, every subcategory of preserving the town's rural character ranked as High. It is recommended the town prioritize the aspects of the it's rural character based on actual percentages given by townspeople. This is an area where developing the co-occurrence imagery will be particularly helpful.

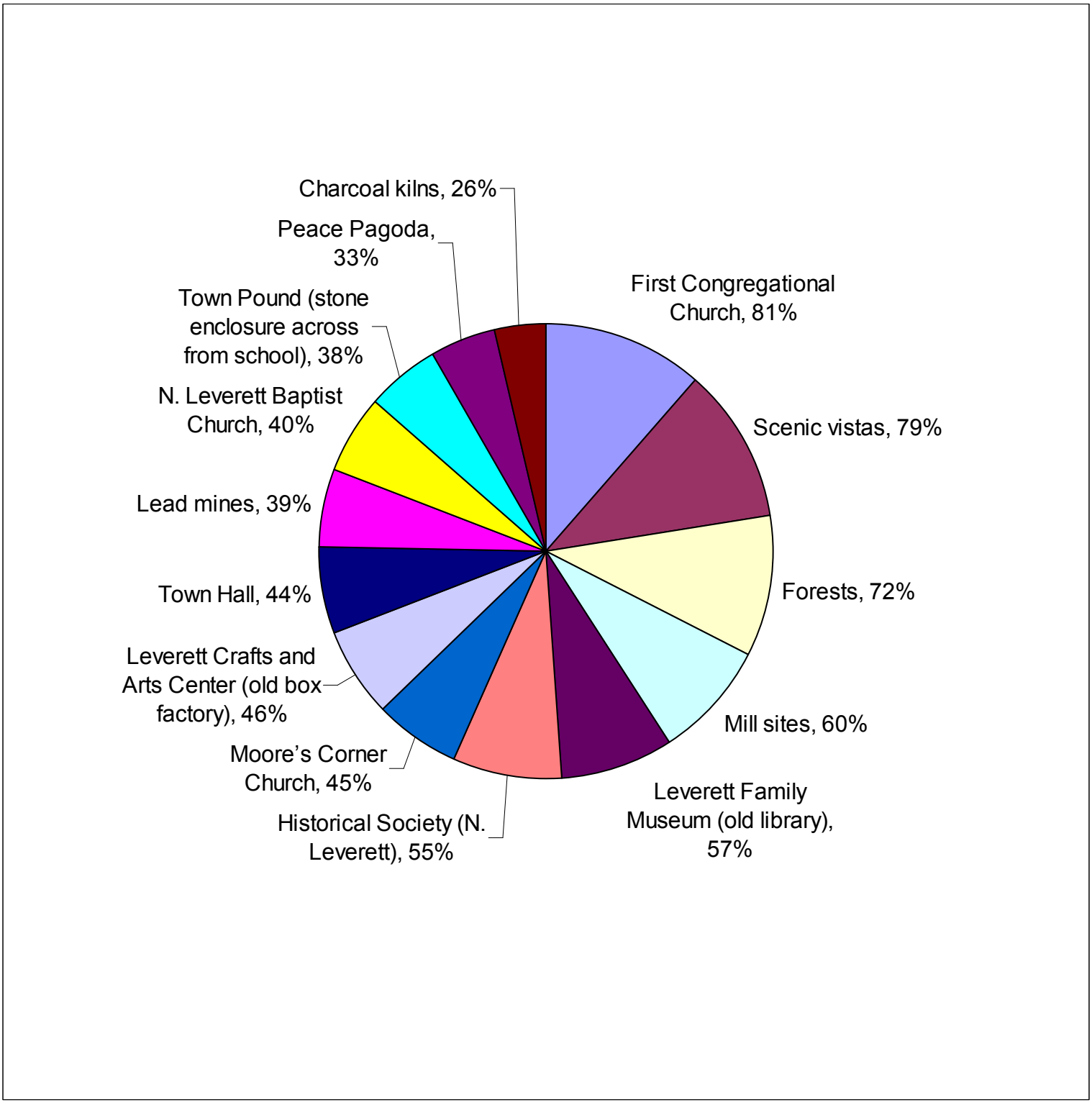

Figure 7. High Importance- Preserve the rural character of the town

SECTION 8: GOALS AND OBJECTIVES

The overall goal of this plan update is to outline specific actions Leverett townspeople and government can take to protect and preserve the features and resources regarded as essential for the high quality of life enjoyed in their town. The list of goals and objectives below is based on citizen response to the survey, as well as the assessment of the 2005 Goals and Objectives.

Goal 1. Preserve the Rural Character of the Town

a. Continue to implement the Community Development Plan;
b. Preserve historic and cultural resources including historic homes based on rankings provided by townspeople;
c. Identify options for permanently closing abandoned and discontinued roads and designate them for recreational use and for resource protection/management (note: review definition of terms "abandoned roads" vs. "discontinued roads");
d. Explore various zoning options for managing growth and enact appropriate measures such as agricultural zoning, large-lot zoning, cluster zoning, structure height restrictions, ridge top development, house size-lot size ratio, soil/topographic limitations, and back lot development;
e. Re-establish a building cap.
f. Evaluate setbacks for construction and restrictions on roadside shade tree removal.

Goal 2. Protect and Preserve Natural Resources

a. Rank major wildlife core habitats (including vernal pools), riparian corridors, core habitats, significant soil types, other mineral deposits, and scenic vistas; and pursue ways to protect and maintain corridors among wildlife habitats;
b. Rank critical water resources and strengthen their protection;
c. Maintain and manage town lands to enhance wildlife habitat and diversity; continue with DCR Forest Stewardship program
d. Educate and Encourage landowners to manage their lands to benefit fish and wildlife (including use of best management practices to maintain natural hydrologic regime);
e. Develop a ranking scheme for open space acquisition and actively pursue acquisition through purchases, gifts, conservation restrictions, and easements.
f. Seek alternate ways to protect open space besides acquisition (e.g., Brushy Mountain and scenic vistas).
g. Develop co-occurrence maps of cultural and natural resources to identify priority areas.

Goal 3. Improve Public Education Related to Open Space

a. Develop and make available trail-maps/guides/signage to Leverett's most highly ranked trails, open space, and recreation areas (e.g., hiking, cross-country skiing, mountain biking, etc.);
b. Establish public education informational space at Town Library;

c. Develop a booklet for improving landowner awareness of open space needs and the benefits and options of private stewardship (e.g., answer questions about landowner liability for trail usage);

Goal 4. Provide Wider Recreational Uses of the Town's Natural Resources

a. Work with the Leverett Pond Committee to implement Nuisance Aquatic Plant Management Plan to increase recreational use of Leverett Pond (e.g., for swimming, boating, fishing, skating, and birding; including construction of a handicapped accessible boardwalk on south end of the pond and a trail around the pond);
b. Expand trails throughout the town to improve their interconnections;
c. Evaluate potential restrictions for use of certain trails based on site limitations (e.g., soil stability);
d. Seek public recommendations to establish greenway corridors for public access across natural resources throughout town;
e. Explore options, then plan and construct an easily accessible walking track (or trail loop) for senior citizens and others;
f. Complete the school-to-school trail (Leverett-Shutesbury).

SECTION 9: FIVE YEAR ACTION PLAN

Goal 1. Preserve the Rural Character of Leverett

Action	**Responsible Board/Group**	**Start Date**
Continue to implement the the Community Development Plan.	Select Board, Planning Board, Community Preservation Committee	2005; Continued 2010
Preserve historic and cultural resources including historic homes (Historic Commission) based on rankings provided by townspeople;	Historical Commission	2005; Continued 2010
Re-establish a building cap.	Planning Board	2005; Continued 2010
Explore various zoning options for managing growth and enact appropriate measures such as agricultural zoning, large lot zoning, cluster	Planning Board	2010

zoning, structure height restrictions, ridge top development, house size lot size ratio, soil/topographic limitations and back lot development.		
Establish an Agricultural Advisory Commission to study and promote the viability of agriculture in Leverett and investigate agricultural restrictions.	Planning Board	2005; Continued 2010
Establish restrictions on roadside shade tree removal.	Select Board	2010

Goal 2. Protect and Preserve Natural Resources

Action	**Responsible Board/Group**	**Start Date**
Rank major wildlife core habitats (including vernal pools), riparian corridors, core habitats, significant soil types, other mineral deposits, and scenic vistas; and pursue ways to protect and maintain corridors among wildlife habitats;	Conservation Commission	2005; Continued 2010
Rank critical water resources and	Conservation	2005;

strengthen their protection;	Commission	Continued 2010
Maintain and manage town lands to enhance wildlife habitat and diversity; continue with DCR Forest Stewardship program.	Conservation Commission	2005; Continued 2010
Identify and rank scenic vistas and work on ways to protect.	Conservation Commission Planning Board	2005; Continued 2010
Develop a ranking scheme for open space acquisition and actively pursue acquisition through purchases, gifts, conservation restrictions and easements. Land, which contains core habitats and riparian corridors, will be given the highest priority as well as land that connects core habitats.	Conservation Commission	2005; Continued 2010

Goal 3. Improve Public Education Related to Open Space.

Action	**Responsible Board/Group**	**Start Date**
Develop and make available trail maps/guides/signage to Leverett's highest ranked trails, open space, and recreation areas (e.g., hiking, cross-country skiing, mountain biking, etc.);	Rattlesnake Gutter Trust	2010
Establish public education informational space at Town Library;	Conservation Commission Rattlesnake Gutter Trust	2010
Develop a booklet for improving landowner awareness of open space needs and the benefits and options of private stewardship (e.g., answer questions about landowner liability for trail usage);	Conservation Commission	2010
Organize trail hikes on the town trails	Rattlesnake Gutter Trust Friends of Leverett Pond	2010

Goal 4. Promote Wide Recreational Usage of Leverett's Natural Resources

Action	Responsible Board/Group	2005
Work with the Leverett Pond Committee to implement Nuisance Aquatic Plant Management Plan to increase recreational use of Leverett Pond (e.g., for swimming, boating, fishing, skating, and birding; including construction of a handicapped accessible boardwalk on south end of the pond and a trail around the pond);	Leverett Pond Committee Friends of Leverett Pond Conservation Commission	2010
Explore possibility of creating a trail around Leverett Pond.	Leverett Pond Committee Friends of Leverett Pond	2005; Continued 2010
Expand trails around town to increase their interconnections.	Rattlesnake Gutter Trust	2010
Create Leverett Elementary School Outdoor Learning Environment that includes construction of an outdoor classroom, east yard invasive species removal, vernal pool observation platform, construction of bridge	Leverett Elementary School, Conservation Commission	2010

to 53-acre parcel and creation of trails within the parcel.		
Complete Leverett-Shutesbury school-to-school trail.	Rattlesnake Gutter Trust, Select Board, Conservation Commission	2010

SECTION 10: PUBLIC COMMENTS

"Educational/trail maintenance in groups and/or with school kids"

"This is a silly survey because all of these open space and recreational priorities are of the utmost importance."

"Size of housing for single family should have an upper limit in sq. ft."

" Please! Better Cell Phone Coverage! Life Saving! There is no contradiction between a desire to preserve and protect open space and the need for adequate cell phone coverage.

"Sites for wind turbines"

"I would like to make sure wind turbines and other sources of renewable energy are not excluded in any plan."

"This survey represents the ideals of 4 adult residents, F.Y.I."

"Swimming pond at old campground"

"Get rid of the plastic fences at Leverett cemeteries"

"no off road vehicles"

"Access to Leverett Pond: picnicking spots, to sit, to walk around it. Parking for all natural areas. Good non-motorized boating access."

In support of Structure Height Zoning; "Depends on what type of structures-I support a structure that will give us inexpensive access to high-speed internet. It would be nice."

"Field adjacent to school-Maintain baseball diamond as skating rink in the winter."

"I'm against any project that would require a special assessment or tax increase."

"Outlaw" off road vehicles/snowmobiles"

"Dear Commissioners: My number one concern is actually the way up the gravel pit located in Sunderland on the border of Leverett, impacts or has the potential to negatively impact the natural beauty of Leverett. My second concern is that children-young teenagers-drive four wheelers very fast and recklessly on old Long Plain Rd. to access trails. These are kids without licenses (aged 12, 13, 14) and put everyone at risk. Thank you for your work!"

"Avoid clear cutting of trees for "views" keep roadways narrow!"

"Logging and forestry companies should be required to notify abutters of logging activities long prior to the start of work."

"protect/preserve Sawmill River valley."

Lev Family Museum "Could make more of it."

"We have a jewel in town-Leverett Pond-that is very difficult o enjoy. Walks/trails there is the #1 priority Leverett can do."

"Zoning to preserve backland"

"While there are may paces to walk, knowing that one was welcome would be much better. Leveret is nice to look at but needs to be nice to be in."

"In case a wind farm will be installed, in which case we prefer the wind farm to a scenic vista."

"Put more info on the town website"

"Need more information" about zoning.

"Preserve natural beauty of Town by restricting use of public space by private/gvt. Organizations for posting materials and presentations that mar the natural landscape."

"While I am committed to conservation, protection and recreation, I also feel that we, as a town, can balance these priorities and efforts with our need to improve technology and communication. I am not opposed to (and in general would support) allowing strategically placed cell phone

towers, in order to improve cell phone coverage in town. This would be of particular value if such towers might also be used (immediately or in the future) for improving internet access.

"Discourage Jeep/off-road caravans from use of Brushy Mountain + Diamond Match Ridge trails-allow trails to recover from off-road damage."

"Discourage development of exaggerated home construction size, e.g. new Bradley home on Dudleyvlle Rd. and Laurel Hill Development-trophy homes diminish the rural character and sustainable aspirations of our community."

"Encourage renewable energy construction, including appropriately sited wind towers, micro-hydro, solar PV."

"I would like to seethe town help on Leverett Pond with weed control, dam repairs as the town has public access and there is more activity on the pond, witch is nice if the town isn't going to help it will end up a swamp some body should look into grants to hep preserve leverett pond all the towns around us are getting help why cant' we in Leverett get something done-Leverett Tax Payer on Pond."

"The walking path around the pond and the public pond access area should be preserved and protected, possibly even improved."

"I hope the Leverett Conservation Commission. is working closely with the planning board and the public health board, each group should be required to have an official member on the other two boards or committees. The left hand should know what the right hand is doing. I know people who are members of each of these three bodies, and my strong impression is that there is little or no on going working ('day to day") relationship. It seems to me that almost all (if not all) the "priorities" addressed around this survey can not (or best) be realized without the co-operation or approval of planning or public health boards. Trying to "go it alone" is the toughest ay to

accomplish what is needed. In any event, thanks for the time and effort you are giving this most worthwhile topic."

"Incentives for reuse of vernacular bldgs. (out-building, old industrial, old-commercial)"

"Nice to know if ice is safe for skating."

"Stewardship of public land (i.e. ensuring entangling invasives don't overtake other flora.)"

"Promote hiking trails, encourage right of way permission for hiking."

"This is very complete-thanks. If there are other ways of collaborating with other initiatives, i.e., Franklin County Roadway signs, go for it."

"News in the town newsletter."

"Keeping unpaved road, and maintained (like Hemingway)-How about considering bike path like Amherst-Noho.?"

"Maintain all trails, repair bridges with help from townspeople, map trails…this is an inclusive list. Thank you for doing a thoughtful piece of work."

"Mountain Biking shouldn't be allowed."

"Ecology research (turtles etc.)."

"Wildlife viewing area at new Rt. 63 Bridge. Docking area and boardwalks at Leverett Pond."

"What are zoning questions doing in this survey? What are historic site questions doing in this survey?"

"Off-road vehicles should be outlawed except for emergency, handicapped, or professional (survey's etc) use. They've been ruining the trails for the rest of us for years. The fat/flabby slobs who mindlessly use them could use some exercise. NO MORE HOUSES!"

"Trail marking/trail maintenance: make an effort to have large group volunteers on tap, some of whom would always show up for trail maintenance tasks."

"Minimize development to maintain rural character and preserve natural space."

"C.C. could coordinate interested groups in town to participate in joint efforts: Red. Committee, RGT, Friends of Lev Pond. Off-road vehicles are wrecking trails and compromising other uses. ORV's are badly rutting the old M&M trail making some sections impassible after a rain for hikers. Ruts 8" deep in places."

"Safer biking routes especially to town center, traffic continues to grow rapidly. Why can't kids feel safe riding to school?…A greater emphasis on the environment in school curriculum, including more field trips. Administration and many teaching staff don't seem to have much interestin nature's classroom just outside the school and outside everyone's door. It is a missed opportunity. Why not sponsor opportunities?...The cc seems so busy with permitting that nothing else gets done., i.e. trail management, trail marking, species identification. Why not establish a volunteer corps to let people help you out?...By the way, thanks for your work! ...oh yes, Leverett Pond needs town support. if it is to remain a recreational area; swimming, boats, fishing. Millfoil is choking it to death. While the Friends of Leverett Pond contribute to weed cleaning their efforts are temporary and resources limited. A draw-down of water level to kill shore line vegetation (like L. Wyola) seems to be the only real solution. To accomplish this, a professional needs to be hired to get the necessary permits. FLP volunteers can work with this person but no one has the time or expertise it would take to push it through. Is it worth it to preserve such a central and valued resource?"

"Case in point for not advertising: Wed evening (3/17) 630ish my dogs are barking but I look around, see nothing, they persist. I eventually tell them to be quiet. I proceed to leave my driveway and am startled to drive by a man standing right in my yard taking pictures. He tells me to go first-in total disbelief I proceed up the driveway to find 3 other people standing on the road-I

shake my head, start to drive away and think now wait a minute-you're right its a beautiful site oh, and by the way I'm leaving now so why don't you just go out in my backyard!?! Have some respect-people and their boundaries sometimes are amazing in the least now, just imagine if we had Amtrack stop by with tourists."

"I am concerned that existing wetland regulations have not been applied with the same standards. Development on wetlands and development in aquifer areas are allowed for some and not for others. I am concerned for the eventual quality of leverett water. while I buy a hunting license every year I am concerned about public hunting and the over use of ATV's and the like in the Back Country."

"We need more planning to identify priority areas for conservation. Groups to work together RGT, Land Trusts, Con Com and Select Board, Planning Board to gear zoning to protect important areas."

"Dog Park"

"On-line and Quarterly Briefs newsletters"

"High Green Building Standards…green replacement…criteria energy…i.e.. wind sites in town and pv solar. Input on low-impact hydro"

SECTION 11: REFERENCES

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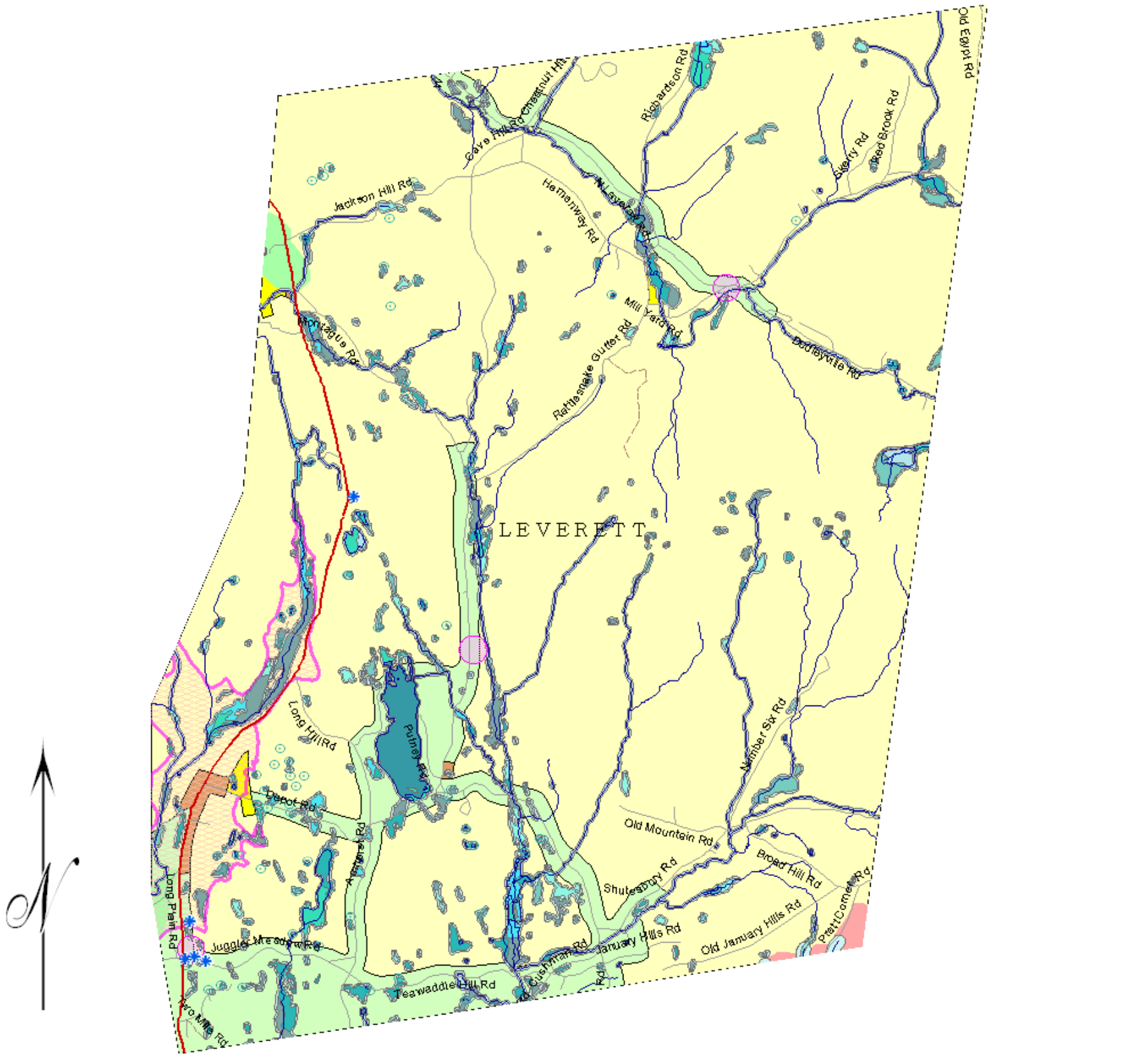
Zoning



Legend

- Primary Road, Limited Access
- Primary Road, Not Limited Access
- Secondary Road
- Local Road, Access Ramp
- Vehicular Trail
- Other Trails
- NHESP Certified Vernal Pools
- Potential Vernal Pools
- Rivers & Streams
- Lakes and Ponds
- BOG
- DEEP MARSH
- OPEN WATER
- SHALLOW MARSH MEADOW OR FEN
- SHRUB SWAMP
- WOODED SWAMP CONIFEROUS
- WOODED SWAMP DECIDUOUS
- WOODED SWAMP MIXED TREES
- Interim Wellhead Protection Areas
- DEP Approved Wellhead Protection Areas (Zone II)
- Title 5 setbacks
- Surface Water Protection Areas-ZONE A
- Surface Water Protection Areas-ZONE B
- Surface Water Protection Areas-ZONE C
- High Yield Aquifer
- Medium Yield Aquifer
- Rural Residential (RR)
- General Business (GB)
- Commercial (C)
- Residential/Village District (RV)

Map Sources

Map produced by The Leverett Conservation Commission (2010).
Digital data obtained from MassGIS. The Massachusetts Executive Office of Environmental Affairs and its agencies to record information from the sources cited in the associated documentation. EOEA maintains an ongoing program to record and correct errors in the GIS data that are brought to its attention. EOEA makes no claims as to the reliability of the GIS data or as to the implied validity of any uses of the GIS data. EOEA maintains records regarding all methods used to collect and process these digital data and will provide this information on request. Executive Office of Environmental Affairs, MassGIS EOEA Data Center, 251 Causeway Street, Suite 900, Boston, MA, 617-626-1000.
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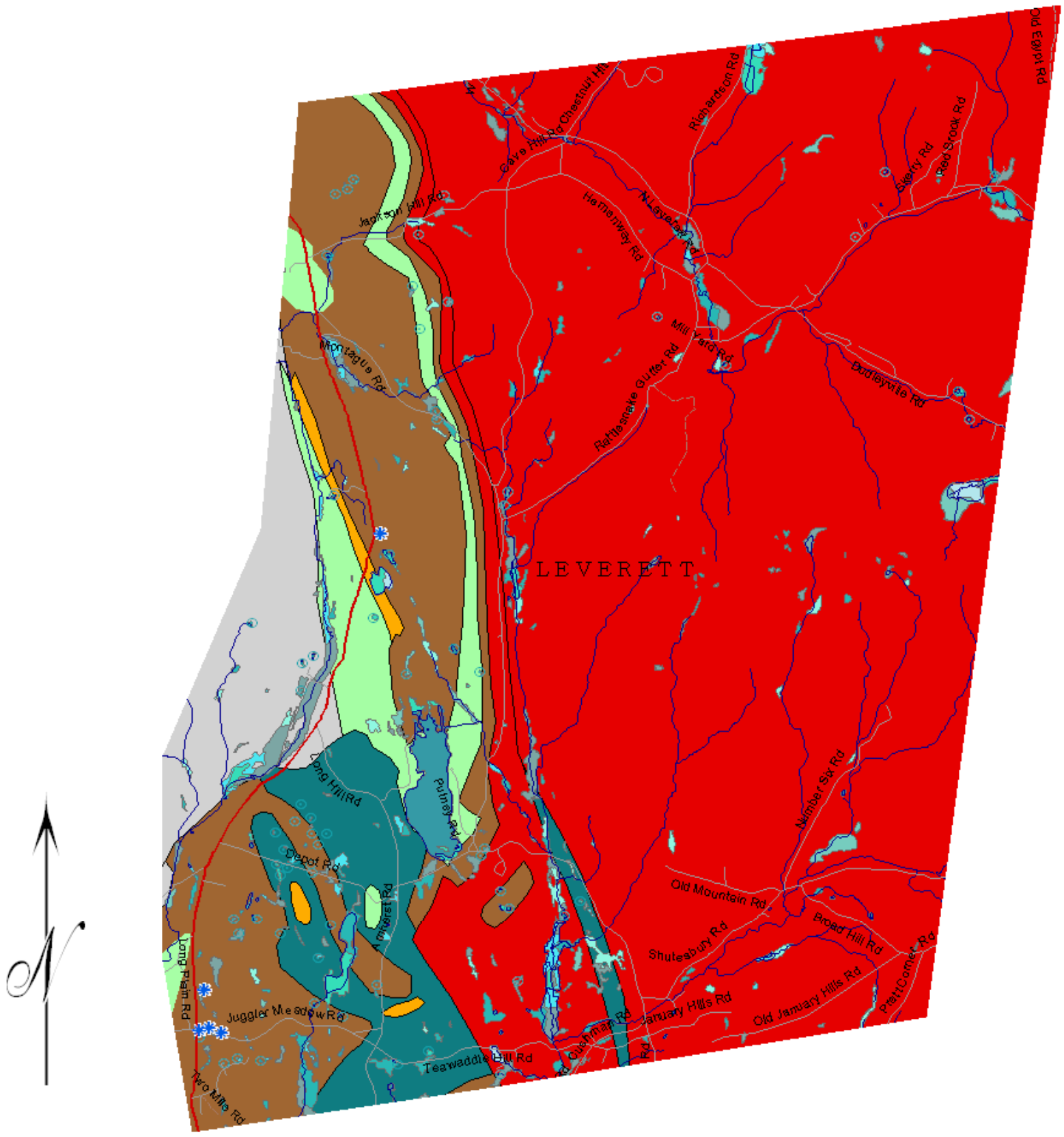
Figure 8. Zoning Map

Geologic Features



Legend

Primary Road, Limited Access	BOG	Avalon Granite	Mesozoic Basin Sed.
Primary Road, Not Limited Access	DEEP MARSH	Basalt	Metamorphic Rocks, other
Secondary Road	OPEN WATER	Calcgranofels	Narragansett Basin Sed.
Local Road, Access Ramp	SHALLOW MARSH MEADOW OR FEN	Calcpelite	Pelitic Rocks
Vehicular Trail	SHRUB SWAMP	Carbonate Rocks	Peraluminous Granite
Other Trails	WOODED SWAMP CONIFEROUS	Felsic Volcanics	Sulfidic Schists
NHESP Certified Vernal Pools	WOODED SWAMP DECIDUOUS	Granite, other	Ultramafic Rocks
Potential Vernal Pools	WOODED SWAMP MIXED TREES	Grenville Granite	Unconsolidated Sed.
Rivers & Streams	High Yield Aquifer	Mafic Rocks	Water
Lakes and Ponds	Medium Yield Aquifer		

Map Sources

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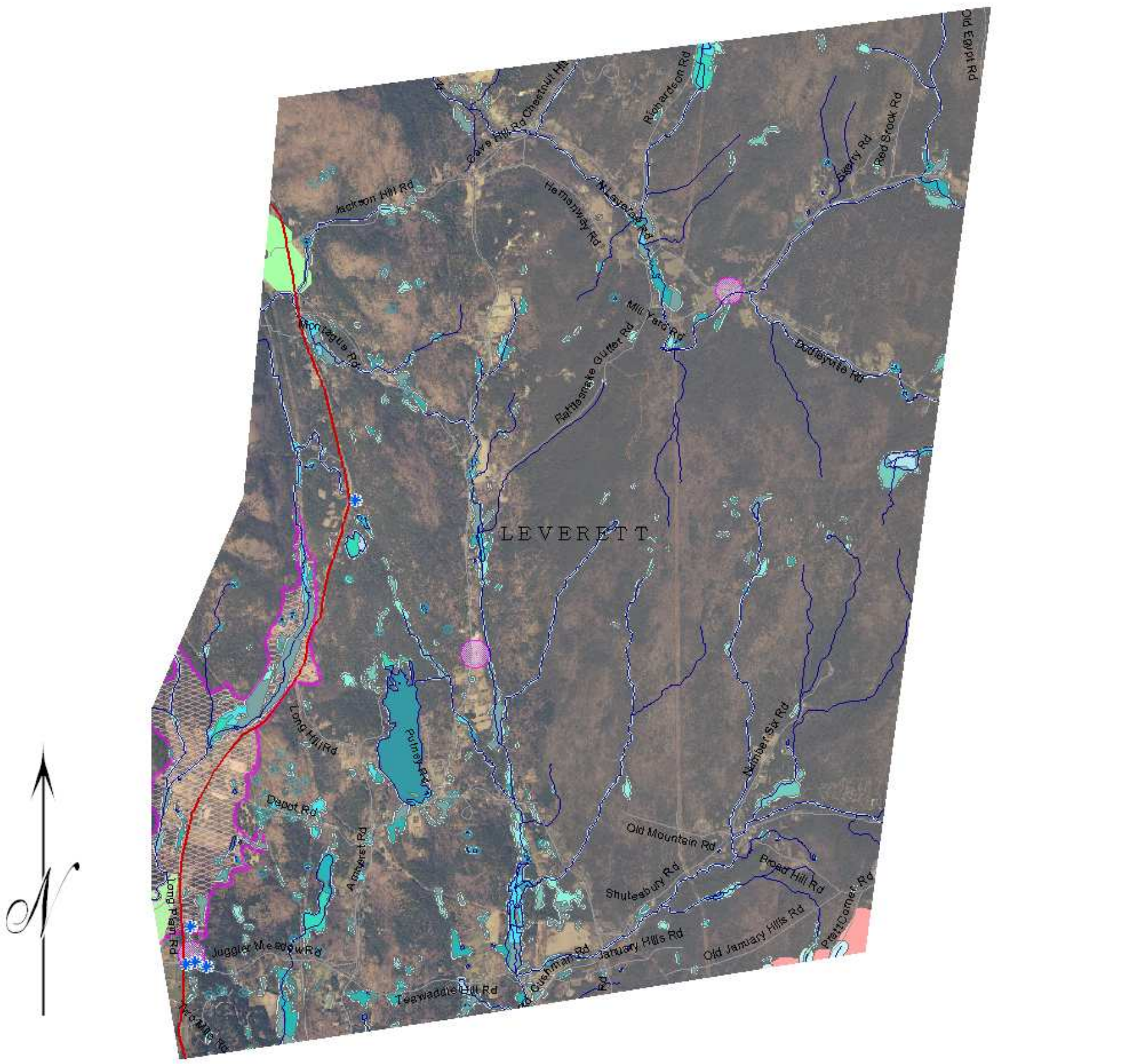
Figure 9. Geologic Features

Water Resources



Legend

- Primary Road, Limited Access
- Primary Road, Not Limited Access
- Secondary Road
- Local Road, Access Ramp
- Vehicular Trail
- Other Trails
- NHESP Certified Vernal Pools
- Potential Vernal Pools
- Rivers & Streams
- Lakes and Ponds
- BOG
- DEEP MARSH
- OPEN WATER
- SHALLOW MARSH MEADOW OR FEN
- SHRUB SWAMP
- WOODED SWAMP CONIFEROUS
- WOODED SWAMP DECIDUOUS
- WOODED SWAMP MIXED TREES
- Interim Wellhead Protection Areas
- DEP Approved Wellhead Protection Areas (Zone II)
- Title 5 setbacks
- Surface Water Protection Areas-ZONE A
- Surface Water Protection Areas-ZONE B
- Surface Water Protection Areas-ZONE C
- High Yield Aquifer
- Medium Yield Aquifer

Map Sources

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Figure 10: Water Resources

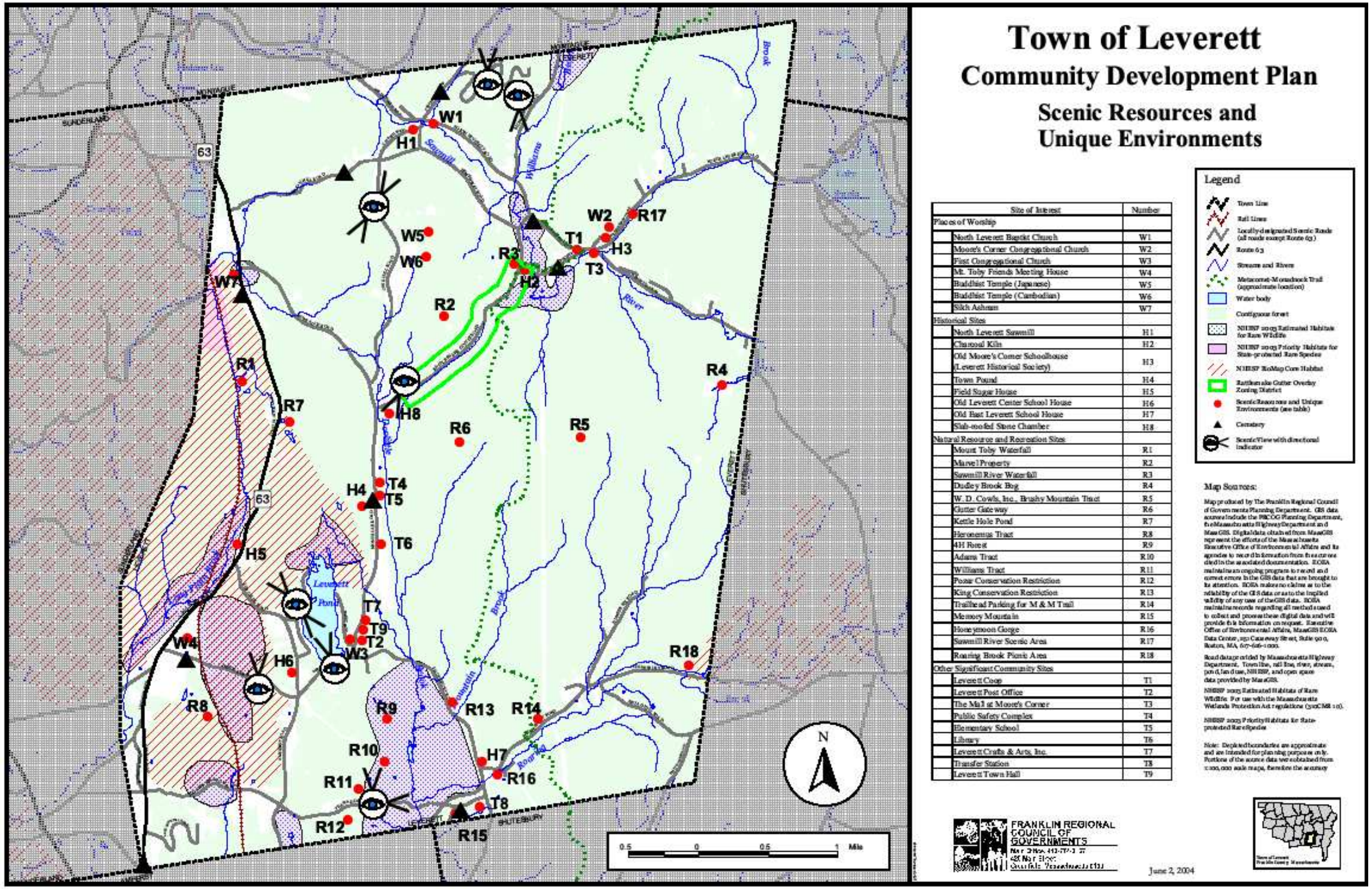
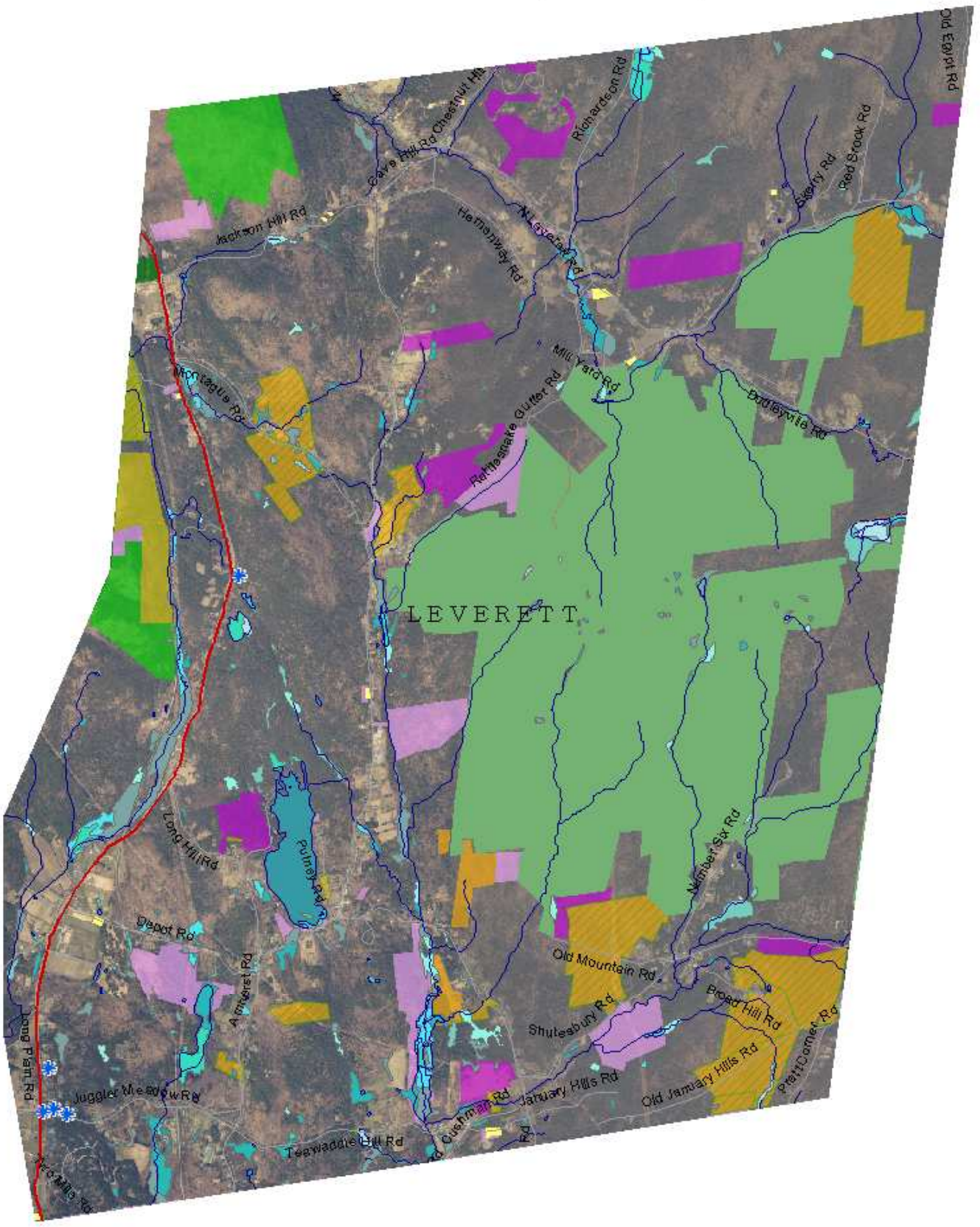


Figure 11: Scenic Resources and Unique Environments

Protected Open Space



Legend

- Primary Road, Limited Access
- Primary Road, Not Limited Access
- Secondary Road
- Local Road, Access Ramp
- Vehicular Trail
- Other Trails
- Leverett cemeteries
- Cowls/Brushy Mountain
- Conservation Restriction
- Agricultural Preservation Restriction
- CR/APR Combination
- Other Legal Interest
- Federal
- DCR-State Parks & Recreation
- DCRS/DFG
- Department of Fish & Game
- DCR-Urban Parks & Recreation
- DCR-Water Supply Protection
- Department of Agricultural Resources
- Commonwealth of Massachusetts
- County
- Municipal
- Public Non-Profit
- Land Trust
- Conservation Organization
- Non-Profit
- Private
- Other
- Unknown
- BOG
- DEEP MARSH
- OPEN WATER
- SHALLOW MARSH MEADOW OR FEN
- SHRUB SWAMP
- WOODED SWAMP CONIFEROUS
- WOODED SWAMP DECIDUOUS
- WOODED SWAMP MIXED TREES
- Lakes and Ponds
- Rivers & Streams

Map Sources

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Figure 12: Protected Open Space

Appendix A: Permanently Protected Land

Owner	Department	Location	acre owned	CRs	acre owned	cons CRs	subtotal	subto
Rattlesnake Gutter Trust								
		Amherst Rd		16.50				
		Camp Rd/Long Hill	35.60					
		Cushman Rd	29.00					
		Cushman Rd		3.00				
		Laurel Hill		61.00				
		Old Mountain Rd		115.50				
		Putney Rd		2.50				
		Rat Hollow Rd	16.00					
		Rattlesnake Gutter Rd	20.00					
		Rattlesnake Gutter Rd		40.00				
		Ryans Hill Rd	26.00					
		Shutesbury Rd		2.00				
		Shutesbury Rd		6.00				
		Shutesbury Rd	13.50					
		RGT SUBTOTAL			**140.10**	**246.50**		
other land trusts								
Mt Grace		Amherst Rd		6.50				
Franklin Land Trust		Broad Hill Road		191.00				
Valley Land Fund		Long Hill Rd		0.75				
Franklin Land Trust		North Leverett Road		146.30				
Kestrel Trust		Skerry Rd	10.00					
		OTHER LAND TRUST SUBTOTAL			**10.00**	**344.55**		
Comm.MA								
	DFW	Jackson Hill Rd	135.00					
	"	"						
	"	"						
	UMass	Long Plain Rd	7.70					
	DEM	Long Plain Rd	167.00					
	DFW	Long Plain Rd	100.00					
	DEM	Montague Rd		93.00				
	DFW	Long Plain Rd	8.00					
		STATE SUBTOTAL			**417.70**	**93.00**		
Leverett								
		Depot Rd	34.00					
	Lev Cons	Depot Rd	4.50					
		Depot Rd	0.70					
CPA		Depot Rd	8.87					
	town of	Hemenway Rd	0.50					
		Jackson Hill Rd	9.00					
		Jackson Hill Rd	14.00					
		Long Plain Rd	7.00					
		Long Plain Rd						
		Long Plain Rd						
CPA, probably never		Long Plain Rd						
		Montague Rd	2.50					
		Montague Rd	6.00					
		Montague Rd	53.00					
		N.Leverett Rd	2.05					
	Lev Cons	Putney Rd	0.07					
	Lev Cons	Rat Hollow Rd	34.00					
CPA in progress	Lev Cons	Rat Hollow Rd	13.00					
	Lev Cons	Rat Hollow Rd	4.00					
	town of	Rattlesnake Gutter Rd	40.00					
		Shutesbury Rd	34.90					
	Lev Cons	Shutesbury Rd	31.00					

	Shutesbury Rd	40.00			
Lev Cons	Teawaddle Hill Rd		1.00		
	Teawaddle Hill Rd	15.90			
Inhabits of Lev.	Teawaddle Hill Rd	22.00			
	TOWN SUBTOTAL			**376.99**	**1.00**
	ALL OWNERS SUBTOTAL			**944.79**	**685.05**

	total in acres
ALL OWNERS, TOTAL PROTECTED LAND	**1,630**
TOTAL ACREAGE, LEVERETT	**14,709**
PERCENT OF TOTAL PERMANENTLY CONSERVED	**11.08%**

Appendix B: Birds of Leverett (Species List)

Species	Status
Common Loon	migrant
Pied-billed Grebe	migrant
Do.-cr Cormorant	migrant
American Bittern	*?
Philadelphia Vireo	migrant
Green Heron	*
Bl-cr Night Heron	migrant
Turkey Vulture	nests in area
Snow Goose	migrant
Canada Goose	*
Wood Duck	*
Am Black Duck	*?
Mallard	*
Ring-necked Duck	migrant
Bufflehead	migrant
Hod. Merganser	*
Com. Merganser	migrant
Osprey	migrant
Bald Eagle	nests in area
Northern Harrier	migrant
Sharp-shin. Hawk	*
Cooper's Hawk	*
Northern Goshawk	nests in area
Red-should. Hawk	*
Broad-w. Hawk	*
Red-tailed Hawk	*
American Kestrel	*
Merlin	migrant
Peregrine Falcon	nests in area
Ring-n. Pheasant	introd.released
Ruffed Grouse	*
Wild Turkey	*
Virginia Rail	*
Sora	*?

Species	Status
American Coot	migrant
Killdeer	*
Common Snipe	migrant
Am. Woodcock	*
Ring-billed Gull	in area all year
Herring Gull	in area all year
Gr, Black-b. Gull	in area all year
Rock Pigeon	introduced
Mourning Dove	*
Black-b. Cuckoo	*?
Yellow-b. Cuckoo	migrant
E. Screech-Owl	*
Gr Horned Owl	*
Barred Owl	*
No Saw-wh Owl	*
Com. Nighthawk	migrant
Whip-poor-will	*
Chimney Swift	*?
Rub-th Humming.	*
Belted Kingfisher	*
R-bWoodpecker	*
Yel.-b Sapsucker	*
Dow. Woodpecker	*
Hairy Woodpecker	*
Northern Flicker	*
Pilea. Woodpecker	*
East. Wood-Pewee	*
Acad. Flycatcher	*?
Alder Flycatcher	*
Willow Flycatcher	*
Least Flycatcher	*?
Eastern Phoebe	*
Gr.Cres Flycatcher	*
Eastern Kingbird	*

Species	Status
Northern Shrike	winter
White-eyed Vireo	migrant
Blue-headed Vireo	*
Warbling Vireo	*
Great Blue Heron	*
Red-eyed Vireo	*
Blue Jay	*
American Crow	*
Common Raven	*
Horned Lark	winter
Tree Swallow	*
Bank Swallow	*?
Barn Swallow	*
Bl-cap. Chickadee	*
Tufted Titmouse	*
Red-br. Nuthatch	*?
Wh-br Nuthatch	*
Brown Creeper	*
Carolina Wren	*
House Wren	*
Winter Wren	*
Marsh Wren	*
Gold.-cr. Kinglet	winter
Ruby-cr. Kinglet	migrant
Bl-gr Gnatcatcher	*
Eastern Bluebird	*
Veery	*
Gr-cc/Bic Thrush	migrant
Swain. Thrush	migrant
Hermit Thrush	*
Wood Thrush	*
American Robin	*
Gray Catbird	*
No Mockingbird	*

Species	Status
Brown Thrasher	*
Eur Starling	introduced*
American Pipit	winter
Cedar Waxwing	*
Blue-w Warbler	*
Tenn Warbler	migrant
Nashv Warbler	*?
Northern Parula	migrant
Yellow Warbler	*
Ch-sid Warbler	*
Mag Warbler	migrant
Bl-th Bl Warbler	*
Yel-r Warbler	migrant
Bl-th Gr Warbler	*
Blackbu Warbler	*
Pine Warbler	*
Prairie Warbler	*
Palm Warbler	migrant
Bay-br Warbler	migrant
Blackpl Warbler	migrant
Bl+wh Warbler	*
Am Redstart	*
Ovenbird	*
No Waterthrush	*
LouWaterthrush	*
Mourn Warbler	migrant
Co Yellowthroat	*
Wilson's Warbler	migrant
Canada Warbler	*
Scarlet Tanager	*
Eastern Towhee	*
Am Tr Sparrow	winter
Chip Sparrow	*
Field Sparrow	*

Species	Status
Savan Sparrow	*?
Fox Sparrow	migrant
Song Sparrow	*
Linc Sparrow	migrant
Swamp Sparrow	*
Wh-thr Sparrow	winter
Wh-cro Sparrow	winter
Dark-eyed Junco	*+win. flocks
Lapl Longspur	winter
Snow Bunting	winter
No Cardinal	*
Ro-br Grosbeak	*
Indigo Bunting	*
Bobolink	*
Red-wi Blackbird	*
East Meadowlark	migrant
Rusty Blackbird	migrant
Common Grackle	*
Br-he Cowbird	*
Baltimore Oriole	*
Purple Finch	*?
House Finch	*
Common Redpoll	winter
Pine Siskin	winter
Am Goldfinch	*
Even Grosbeak	migrant/winter
House Sparrow	introduced*

* nests in Leverett
*? probably nests in Leverett, nests in area - has large area for feeding, seen in Leverett

migrant = seen spring/fall
winter seen fall/winter/early spring

Appendix C: Mammals of Leverett (Species List)

Species	Status
Virginia Opossum	*
Shrews	
Masked Shrew	*
Smoky Shrew	*
Common Water Shrew	sc
Hairy-tailed Shrews	
Moles	
Hairy-tailed Mole	*
Star-nosed Mole	*
Bats	
Little Brown Bat	*
Northern Long Eared Bat	*
Eastern Red Bat	migrant
Hoary Bat	migrant
Silver-haired Bat	migrant
Eastern Pipistrelle	*
Big Brown Bat	*
Hares and Rabbits	
Eastern Cottontail	*
New England Cottontail	*
Snowshoe Hare	*
Squirrels & Marmots	
Eastern Chipmunk	*
Woodchuck	*
Eastern Grey Squirrel	*
Red Squirrel	*
Northern Flying Squirrel	*
Southern Flying Squirrel	*
American Beaver	*
Mice, Rats, Voles	
White-footed Mouse	*
Deer Mouse	*
Norway Rat	*
House Mouse	*
Southern Red-backed Vole	*
Meadow Vole	*
Woodland Vole	*
Common Muskrat	*
Southern Bog Lemming	sc
Meadow Jumping Mouse	*
Woodland Jumping Mouse	*
Common Porcupine	*
Foxes and Wolves	
Coyote	*
Red Fox	*
Common Gray Fox	*
Black Bear	*
Common Raccoon	*
Weasels, Minks & Otters	
Fisher	*
Ermine	*
Long-tailed Weasel	*
American Mink	*
Northern River Otter	*
Cats	
Cougar (unverified sightings)	e
Bobcat	*
Deer and Moose	
White-tailed Deer	*
Moose	migrant

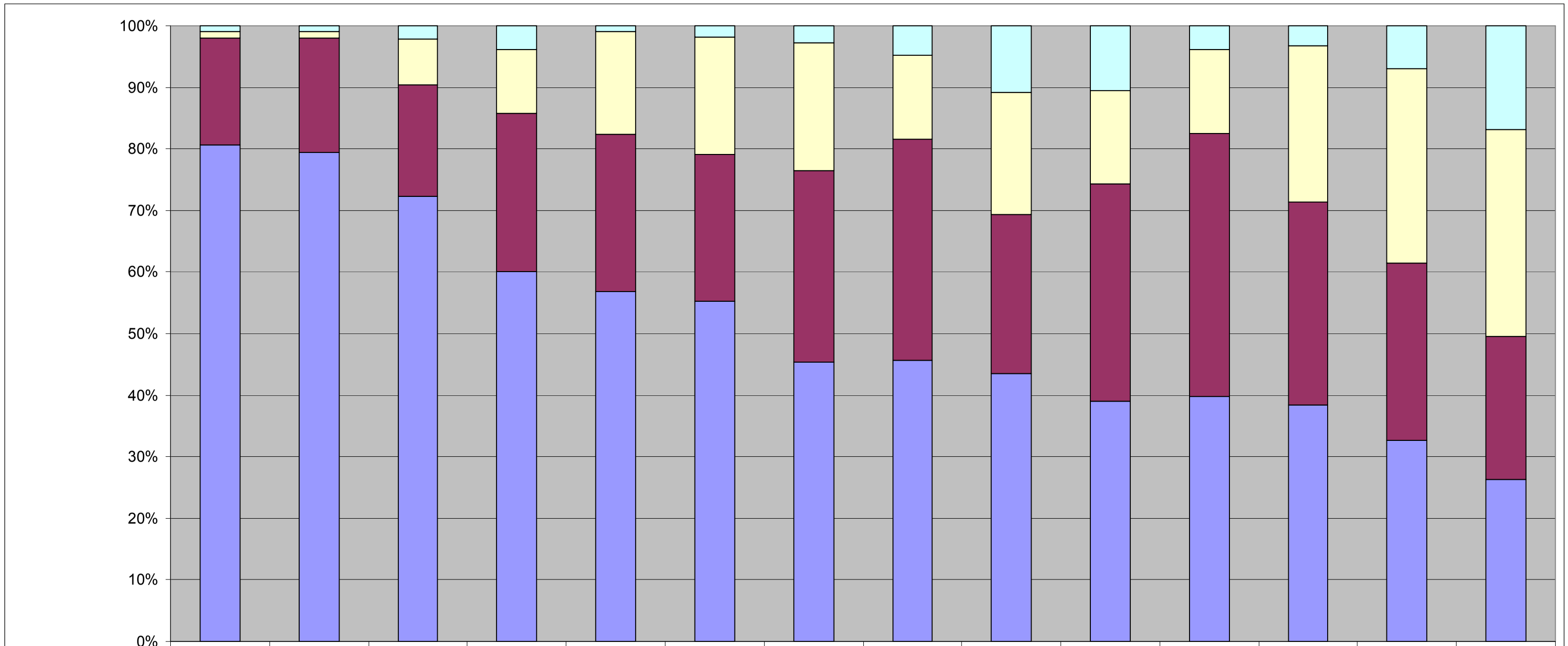
* - Likely to live in Leverett
sc – special concern
e - endangered

Based on Mass Wildlife's State Mammal List 1999

Appendix D: Reptiles and Amphibians of Leverett (Species List)

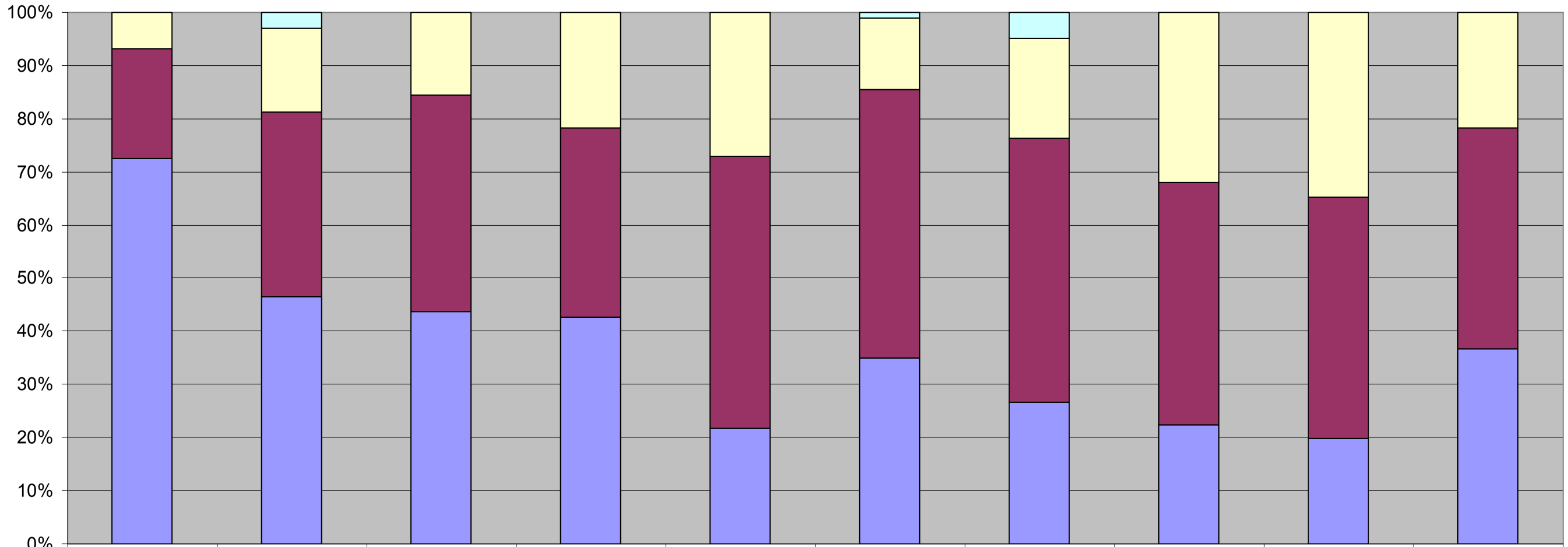
Species	**Status**
Mole Salamanders	
Jefferson Salamander	sc
Spotted Salamander	sc
Marbled Salamander	t
Newts	
Eastern Newt	*
Lungless Salamanders	
Northern Dusky Salamander	*
Eastern Red-backed Salamander	*
Four-toed Salamander	*
Spring Salamander	*
Northern Two-toed Salamander	*
True Toads	
American Toad	*
Fowler's Toad	*
True Tree Frogs	
Spring Peeper	*
Green Tree Frog	*
True Frogs	
American Bullfrog	*
Green Frog	*
Pickeral Frog	*
Northern Leopard Frog	*
Wood Frog	*
Snapping Turtle	*
Eastern Musk Turtle	*
Pond Turtles	
Painted Turtle	*
Spotted Turtle	sc
Wood Turtle	sc
Eastern Box Turtle	sc
Harmless Snakes	
Eastern Racer	*
Ringnecked	*
Eastern Ratsnake	e
Eastern Hognosed Snake	*
Milksnake	*
Northern Watersnake	*
Smooth Greensnake	*
DeKay's Brownsnake	*
Red-bellied Snake	*
Eastern Ribbonsnake	*
Common Gartersnake	*

Appendix E. Preserve the rural character of the town



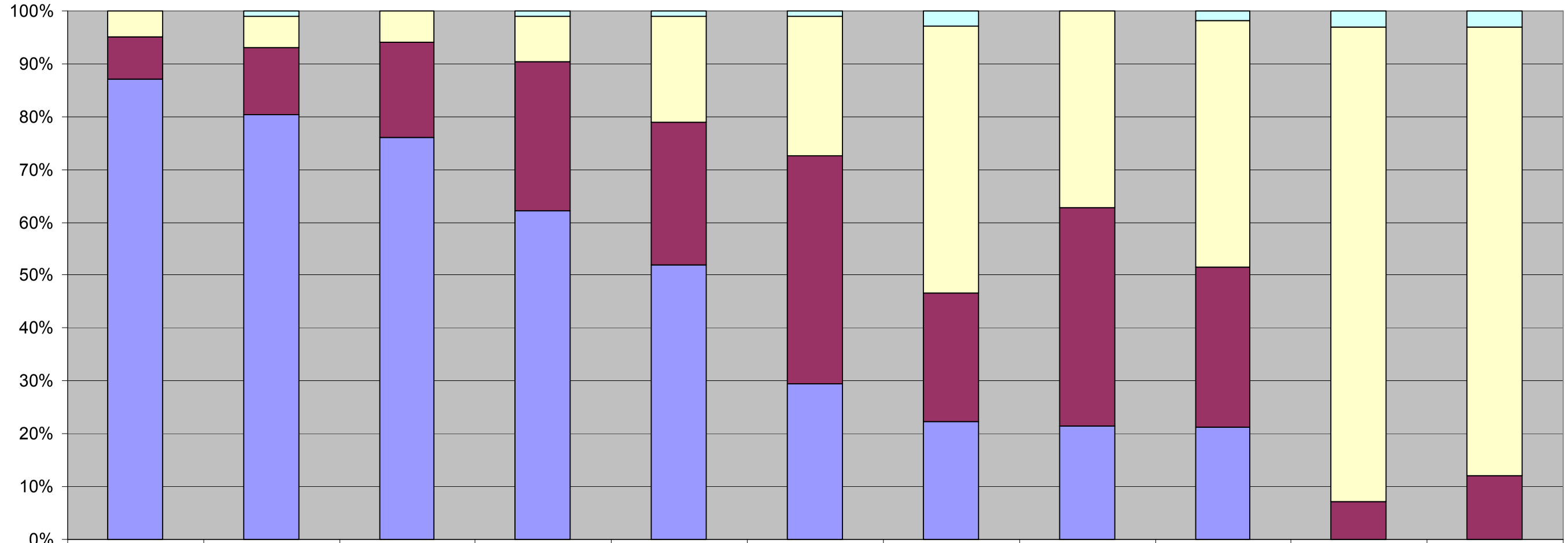
	First Congregational Church	Scenic vistas	Forests	Mill sites	Leverett Family Museum (old	Historical Society (N. Leverett)	Moore's Corner Church	Leverett Crafts and Arts Center	Town Hall	Lead mines	N. Leverett Baptist Church	Town Pound (stone enclosure	Peace Pagoda	Charcoal kilns
I don't know	1%	1%	2%	4%	1%	2%	3%	5%	11%	10%	4%	3%	7%	17%
Low Importance	1%	1%	7%	10%	17%	19%	21%	14%	20%	15%	14%	25%	32%	34%
Medium Importance	17%	19%	18%	26%	25%	24%	31%	36%	26%	35%	43%	33%	29%	23%
High Importance	81%	79%	72%	60%	57%	55%	45%	46%	44%	39%	40%	38%	33%	26%

Appendix F. Improve public education concerning recreational opportunities, natural resources and open space



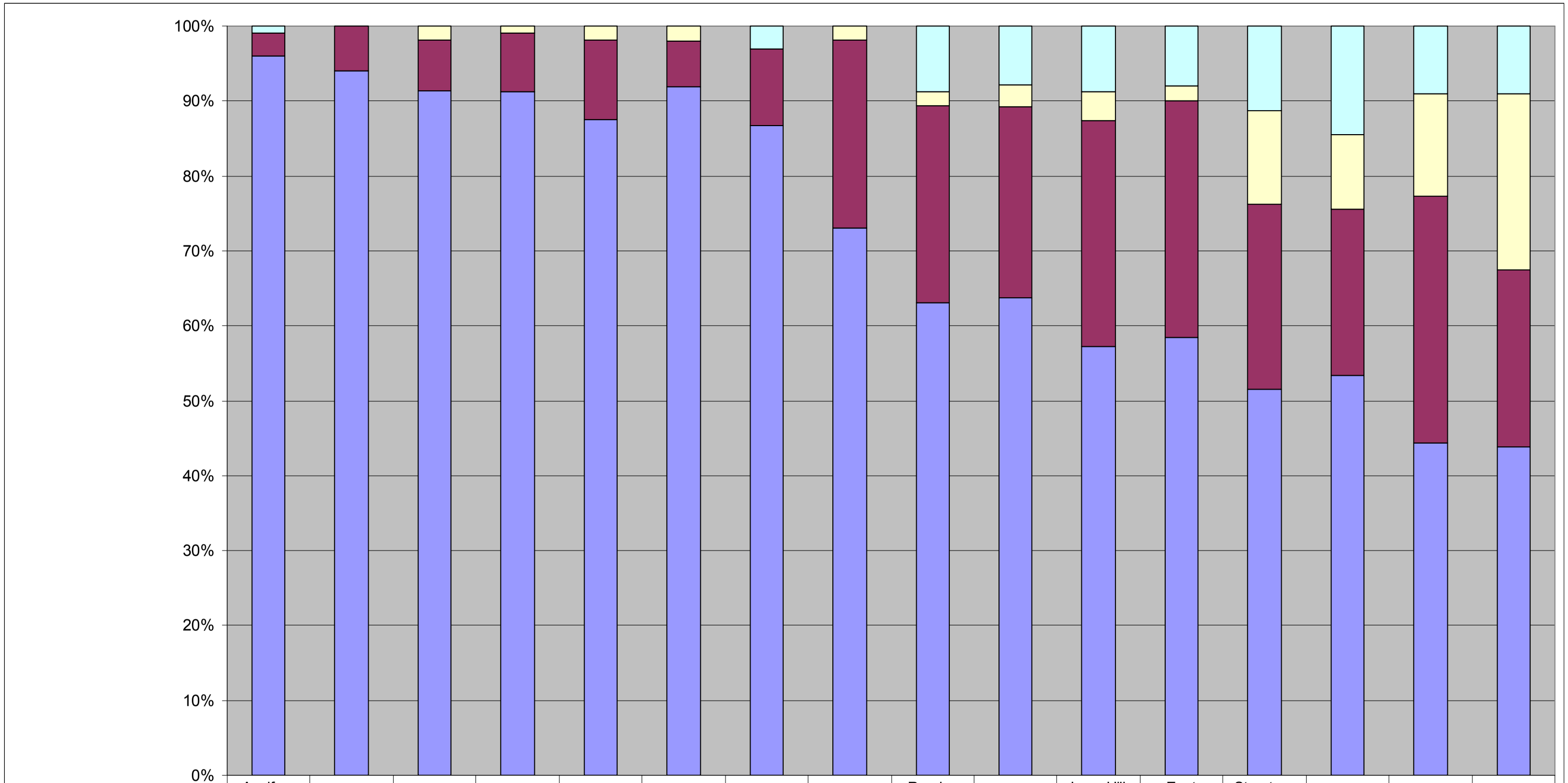
	Maps/trail guides	Outdoor recreational facilities	Newsletters	Group walks/hikes	Public meetings	Signs/kiosks	Informational space at Town Library	Land-use flyers/pamphlets	Public workshops	Town website
Importance to Me Don't Know	0%	3%	0%	0%	0%	1%	5%	0%	0%	0%
Importance to Me Low	7%	16%	16%	22%	27%	14%	19%	32%	35%	22%
Importance to Me Med	21%	35%	41%	36%	51%	50%	50%	46%	46%	42%
Importance to Me High	73%	47%	44%	43%	22%	35%	27%	22%	20%	37%

Appendix G. Provide wider recreational uses of the town's natural resources



	Walking	Observe nature	Hiking	X-country skiing/snowshoeing	Boating (kayaking/canoeing)	Ice skating	Hunting/Fishing	Climbing	Mountain biking	Off-road vehicles	Snow-mobiling
Importance to Me Don't Know	0%	1%	0%	1%	1%	1%	3%	0%	2%	3%	3%
Importance to Me Low	5%	6%	6%	9%	20%	26%	50%	37%	47%	90%	85%
Importance to Me Med	8%	13%	18%	28%	27%	43%	24%	41%	30%	7%	12%
Importance to Me High	87%	80%	76%	62%	52%	29%	22%	22%	21%	0%	0%

Appendix H. Protect and preserve natural resources and open space



	Aquifers (drinking water)	Rivers/streams	Rattlesnake Gutter	Wetlands	Leverett Pond	Wildlife habitat	Biological diversity	Brushy Mountain	Roaring Brook Conservatio	4-H Forest	Long Hill Natural Area	East Leverett Meadow	Structure height restrictions	Cluster zoning	House size lot size ratio	Large lot zoning
Importance to me Don't know	1%	0%	0%	0%	0%	0%	3%	0%	9%	8%	9%	8%	11%	14%	9%	9%
Importance to me Low	0%	0%	2%	1%	2%	2%	0%	2%	2%	3%	4%	2%	12%	10%	14%	24%
Importance to me Med	3%	6%	7%	8%	11%	6%	10%	25%	26%	25%	30%	32%	25%	22%	33%	24%
Importance to me High	96%	94%	91%	91%	88%	92%	87%	73%	63%	64%	57%	58%	52%	53%	44%	44%