TOWN of SHUTESBURY

Open Space and Recreation Plan Update 2012 – 2019

Special thanks to our dedicated editor, Susan Steenstrup, whose perseverance and skill turned many years of rewrites and updates into this professional plan.

Cover Photo: Ames Pond as viewed from the overlook on Mt. Mineral, fall 2004.

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SECTION 1: PLAN SUMMARY

The Shutesbury Open Space and Recreation Plan Update (2012-2018) reflects the landscape vision and open space priorities for the town – both conservation and recreational. The purpose of this plan is to update the town's 2000-2005 Open Space and Recreation Plan, placing an emphasis on retaining the town's rural character. This document results from a multi-year effort to obtain the most current information on the town's numerous resources and produce a series of maps and appendices which provide a visual representation of the town's land-use patterns and natural resources. A number of factors contributed to the need to update the town's previous plan including:

- The shift from increased residential development in the early 1970s to a leveling off of the population in recent years (the current population is 1,800 residents);
- The recent acquisition of open space by the town, affording opportunities for conservation or mixed conservation and recreation;
- An expressed desire by some of the town's residents for a new, multi-use library which would offer the chance for recreational opportunities and meeting space that are currently absent in the town;
- An increased interest in the town (as well as nearby towns) in investing in renewable energy (i.e., wind, solar power and small biomass) and greater self-sufficiency in locally-grown produce and local agriculture;
- A recognition of the contribution which the large, contiguous forested tracts in Shutesbury make towards carbon dioxide uptake and carbon sequestration;
- The recent conversion of large, forested areas from partially-protected Chapter 61 lands to lands permanently-protected via conservation easements;
- An increased use of Lake Wyola as a residential and recreational area;
- An increased interest in recreational infrastructure to support a broader array of recreational opportunities, including those for residents with disabilities;
- A framework for future residential development based on the zoning bylaw enacted in 2008, and;
- Enactment of a local bylaw to adopt the state's Community Preservation Act (CPA) to provide funding opportunities for affordable housing, land conservation, and historic preservation.

This plan update provides information on important natural features of the town, including soils, geology, surface water and groundwater. This plan also provides a fairly-detailed ecological inventory of the town, due to the town's numerous habitat types and related biological diversity. Other sections of this plan provide a brief description of the town's history, recent and current population trends and a description of lands of conservation and recreational interest**.** Section 5 describes 19 unprotected lands of con-

servation and recreation interest, 12 of which are publicly-owned and 7 of which are privately-owned or owned by non-profit groups.

The town of Shutesbury is currently 87% forested – a natural-resource characteristic which most residents consider its main visual and aesthetic attribute. Pasture and cropland constitute less than 1% of the town's land surface. A significant portion (81%) of open space in the town is under permanent, limited or temporary protection (as documented in Section 5). Due to the large amount of Chapter 61 land in the town, Appendix A has been included to provide landowners with additional details concerning the Chapter 61, 61A and 61B laws. A matrix is included in Appendix A which lists the main provisions of these laws, including landowners' responsibilities for compliance and the town's right of "first refusal" for any lands which may be sold or converted to a non-conforming use.

Only 6% of Shutesbury's land cover is devoted to residential dwellings (with the highest density around Lake Wyola) and opportunities for large-scale development are limited by the town's geology, soils and topography, which restrict the siting of septic tanks and soil absorption systems. Despite the seemingly-low development pressure, the residents of Shutesbury have placed a very high value on the town's rural character and support measures to conserve land on a permanent basis when opportunities occur. In addition, although urban sprawl does not seem to loom on the horizon, other forces threaten to destroy acres of contiguous forest, if left unchecked. Therefore, the town must be vigilant in its oversight of potential invasive flora and fauna, ward against the planting of non-indigenous species and be aware of the risk of disease to trees due to warming trends and the influx of several pest insect species.

The purpose of this plan is to identify the town's most important scenic, environmental, open-space and recreational resources, as well as its open space and recreational needs. The following listing of recommended actions is broad; a complete listing of the goals, objectives and recommended actions are contained in Sections 8 and 9:

(1) Conservation of the largest blocks of contiguous, forested land representing the Commonwealth's forest cores and 1% and 10% largest interior forest blocks;

(2) Protection of key wetlands, rivers and tributaries and associated ecosystems to ensure viable habitat, biodiversity and wildlife corridors;

(3) Enhancement of existing recreational activities and increasing recreational opportunities;

(4) Developing better working relationships with the Conservation Commission and area land trusts to achieve mutual conservation goals;

(5) Engagement with town boards and committees to preserve the town's resources and achieve:

-- permanent protection of lands in Shutesbury which are part of the watersheds for the Town of Amherst's two public surface water supplies;

-- development of a local Heritage Landscape Inventory;

(6) Prioritizing for protection open fields and other non-forested areas, important water features (such as waterfalls, springs, wetlands and vernal pools), areas of high visual and aesthetic value, unique historical and archeological sites, and areas of high wildlife habitat diversity and value or rare species habitat;

(7) Increasing awareness of the types of recreation available to Shutesbury residents on protected state and municipal lands; and,

(8) Encouraging good stewardship by all town residents to maintain the ambient environmental quality of Shutesbury.

SECTION 2: INTRODUCTION

A. STATEMENT OF PURPOSE

Shutesbury last updated its Open Space and Recreation Plan in 2000. The need for an updated plan became evident as the town grew and there was more discussion of recreational needs, and consideration of open space protection. The town has acquired land near the town center for future municipal use, and there is potential for recreational facilities behind the fire station and at the elementary school. Completion of the Master Plan in 2004 and recent "Open Space Design" changes to Shutesbury's zoning bylaw in spring 2008 have encouraged residents to consider and discuss how they want the town to develop and look in the future. The development of a new Open Space and Recreation Plan will allow residents and officials to work together to chart a course into the future for recreation and natural resource protection decision-making.

B. PLANNING PROCESS AND PUBLIC PARTICIPATION

The 2000 Open Space and Recreation Plan, which expired in 2005, was a useful document that provided a good basis for the update. It was frequently consulted, along with sections of the 2004 Master Plan. To produce an updated plan, members of the Recreation and Open Space Committee (Liz Lacy, Janice Stone, Paul Lyons, Graeme Sephton, Dan Lass and Sue Steenstrup) started holding public meetings in 2005 to generate interest and discuss ideas for the new plan. The first meeting on the update to the 2000 Open Space and Recreation Plan was held on April 14, 2005. Subsequent meetings in 2005 were held in May, June, July and September. These meetings were useful to determine the range of interests town residents had for recreation and open space. After this informal information-gathering process, a survey was drafted by Janice Stone, based on good examples from nearby towns, but with questions directed towards Shutesbury's particular interests and concerns. The survey was distributed with the town newsletter to 875 households in January 2006, with a requested return deadline of March 1, 2006. Copies were also made available at the post office, Town Hall and library, as well as on the town's web site. A copy of the survey is included in the Appendix B and the compiled comments are contained in Appendix C. The survey consisted of 17 questions on five (5) pages. Completed forms could be mailed in or dropped off at Town Hall. A total of 185 responses were received, representing a response rate of 21%.

Janice Stone compiled and Sue Essig analyzed the results of the survey by hand tally. A summary and analysis of the responses is included in Appendix D. Original returned surveys were given to the Town Clerk for storage once the results had been tallied. In addition to answers to specific questions, respondents provided a wealth of open-ended feedback on a wide variety of topics related to open space and recreation. The Town Clerk (Leslie Bracebridge) and Assistant Town Clerk (Joan Hanson) transcribed all the narrative feedback from each individual survey into an organized document that provided useful input to the Recreation and Open Space Committee.

After reorganization of the Recreation and Open Space Committee into two separate committees in 2007, the Open Space Committee began, in earnest, to update the information and complete the plan. With an expanded membership (Janice Stone, Sue Essig, Veronica Richter, Sue Steenstrup, Joanne Sunshower, Jeff Lacy, Geoffrey Rogers and Dan Hayes), they started meeting monthly in Town Hall, with meetings posted on the Town Hall bulletin board and eventually on the calendar on the town's web site. A web page for the Open Space Committee was created on the town's web site, and included the mission statement, list of committee members, meeting schedule and a link to a copy of the old plan. Sue Steenstrup, with some assistance from Geoffrey Rogers and Jeff Lacy, began a comprehensive update and expansion of Section 4 of the previous plan (*Environmental Inventory and Analysis).* The decision was made to substantially increase the scope and detail of the environmental information in this section of the plan, not only to serve the purposes of the Open Space and Recreation Plan, but to serve as an up-to-date resource for the town on environmental issues and regulations for a number of years to come. Sue Essig and Veronica Richer began a review of Assessors' lot information in order to update Section 5 (*Inventory of Lands of Conservation and Recreation Interest*). Janice Stone began assembling and updating Massachusetts Office of Geographic Information (MassGIS) mapping information for the town, while Joanne Sunshower began to collect information on population statistics and regional socioeconomic information and trends.

In 2008, the Committee developed a consistent membership of Sue Essig, Liz Lacy, Sue Steenstrup, Veronica Richter, Joanne Sunshower, and Janice Stone. Liz and Janice had participated in the compilation of the 2000 Open Space and Recreation Plan, and Janice with the 1995 Open Space and Recreation Plan, as well. Liz assembled information on properties of recreational interest in town and drafted portions of the text for Section 5. In April 2008, the Committee held a Public Informational Forum on the status of the Open Space and Recreation Plan and the results of the survey. The same month, the North Quabbin Regional Landscape Partnership held a Conservation Forum in Shutesbury, to explain conservation planning and the benefits of conservation restrictions (CRs). The Committee continued to work on updating the protected lands parcel list, land-use and other maps, and the main chapters. The Open Space Committee also met with the Historical Commission in September 2008, to discuss conducting a Heritage Landscape Inventory of important landscapes with cultural and historical features, and to determine what these areas might be in town. The town chose not to pursue the state program at that time, due to short notice and both the Committee and the Historical Commission being too busy with other work to take the lead on it.

In early March 2009, the Committee held a working group, open space planning meeting with representatives from The Kestrel Trust, a local land trust, The North Quabbin Regional Landscape Partnership, and the Conservation and Open Space Planner for the largest private landowner in town, a local lumber company. The purpose was to discuss open space planning from a regional, as well as local perspective, to guide the committee in their open space and recreation plans. Members learned about regional

projects that might help their own efforts, and discussed Shutesbury open space issues, as well.

The committee had originally hoped to have a draft of the plan ready for Annual Town Meeting, first in Spring 2009 and then in 2010, however, family issues, work commitments and/or other volunteer commitments (often service on other town committees) of some members of the Committee from late 2008 onward caused irregular attendance at meetings and delays in completing work assignments, resulting in the committee's inability to achieve a quorum, coordinate and/or distribute work assignments and keep things moving forward on a reasonable schedule. What slowed the plan completion process even more were delays in completing the Inventory of Lands of Conservation and Recreation Interest (Map 7) and assembling that parcel information for protected lands and town lands into the required tables. This was because of the difficulties reconciling discrepancies between Assessors' information and MassGIS data regarding protected open space parcels and their acreage, and updating or creating new digital information for the maps. Many of the discrepancies required finding and reading the deeds from the Registry of Deeds, to determine the protection statuses, sizes and shapes of the restricted or otherwise-protected parcels. Two examples of this were some Quabbin Watershed Lands and Amherst Watershed and Conservation Lands. Another example was the huge Brushy Mountain CR that was established 2011. The digital parcel data was not available for a year, and then all the parcels in the CR in Shutesbury were labeled with the same acreage (3,486), which was the total acreage for the CR covering parcels in both Leverett and Shutesbury. This made it very difficult to determine acreage remaining outside the CR for parcels that were split.

Other map layers also needed updating, and had to be done by the Committee. The existing land-use data layer was old (2001) and not entirely correct. In 2009, Janice reinterpreted it with the most recent orthophotos available at the time (2005). She also classified the forest into three categories (hardwood, softwood, and mixed) since it was the most important land cover for the town. The Chapter 61 digital data layer from MassGIS was old (assumed to be from the 1990s) and no longer correct, which led to the Committee members spending years assembling the information, and updating it as it changed each year. This effort was made more difficult by the unusual way blocks of Chapter 61 properties were lumped together in the Assessors' database ("z-lots"). The z-lots combined many (up to 53) parcels under one parcel label, hiding individual acreages and sometimes with different listings of which parcels were included in each "z-lot".

Other data layers that had to updated more than once, because of changes in the information over the course of producing this plan, included open space, town parcels, zoning (due to major changes in 2009), and Natural Heritage and Endangered Species (NHESP) polygons. When work on the plan first started, the NHESP polygons were just Estimated and Priority Habitat polygons. They were replaced by the first BioMap series in 2009, and then by BioMap 2 in 2011, with 13 different data layers. A map with trails should have been easy, but although MassGIS provided a trails data layer, it did not include local trails on conservation land, nor the new New England National Scenic

Trail, because it was to be re-routed in Shutesbury and the old Metacomet & Monadnock (M&M) Trail discontinued. The trail information was digitized by hand from available maps to create the information on our *Unique Features Map* (Map 5).

From summer 2009 to January 2012, the remaining core group of Janice Stone, Sue Essig, Veronica Richter and Sue Steenstrup wrote the majority of the plan and created and assembled accompanying maps and appendices. Janice Stone spent considerable time during the latter half of 2011 working with the North Quabbin Regional Landscape Partnership and the Franklin Regional Council of Governments' Planning Department developing and perfecting the required and optional maps needed for inclusion in the plan. Martina Carroll, from the town's Americans with Disabilities Act (ADA) Committee, provided the information for Appendix F.

After slow, but steady progress, the Committee created a draft of the entire plan for distribution to the various town boards and committees, interested residents, landowners, public agencies, and non-profit organizations in January 2012. Over 33 people received paper or electronic (CD) copies of the draft for their review. Those receiving copies included the Conservation Commission, the Select Board, the Planning Board, the Town Center Committee, the ADA Committee, the Board of Health, the Water Resources Committee, the Historical Commission, the Department of Conservation and Recreation Forests and Parks and Water Supply Protection Divisions, Cinda Jones (Cowls Lumber), the Lake Wyola Association, the Kestrel Trust, the North Quabbin Regional Landscape Partnership, and the Franklin Regional Council of Governments Planning Department. It was also available on the town's web site. Reviewers were given four weeks to submit comments, but the comment period was extended by public request. Comments were then discussed and incorporated into the revised plan, where appropriate.

Reviewing comments on the draft plan and researching answers occupied the Committee's time from mid-2012 through mid-2014. Some information presented in the draft plan had promoted heated discussions among some segments of the community or generated questions and requests from members of other town committees. These issues required subsequent meetings and investigations to flesh out the issues and address all concerns to the degree possible within the scope and purpose of the Open Space and Recreation Plan. Progress was again slowed by the Committee's frequent inability to get a quorum, because of the job and personal commitments of this volunteer committee's members and the inability to obtain comments from some of the groups that the Massachusetts Executive Office of Environmental Affairs requires comments from prior to granting approval of Open Space and Recreation Plans. Team "burnout", after many unpaid hours of work by the volunteer committee members, also played a role.

After the plan was revised, based on comments received during the first public comment period, a second public comment period was established, beginning in February 2015 and running for four weeks. Comments from the second public comment period were incorporated into the final revised plan, as appropriate. The final

revised plan was submitted to the Massachusetts Executive Office of Energy and the Environment's Division of Conservation Services (DCS) for review and approval. The Shutesbury Open Space and Recreation Plan was approved by Massachusetts' Executive Office of Energy & Environmental Affairs (EOEEA) on April 21 2015, for use through March 31, 2019.

SECTION 3: COMMUNITY SETTING

A. REGIONAL CONTEXT

The town of Shutesbury is a rural community within Franklin County. The southern portion of the town borders other small towns in the Five-College Area, including Pelham and Amherst. The northern portion of the town is adjacent to the boundaries of Leverett and Wendell, also both very rural communities, and contains the majority of the Lake Wyola watershed (Map 1). At the start of 2009, the town's population consisted of 1,800 residents within a total land area of 27 square miles or 17,408 acres. Despite a gradual growth in population from the 1970s into the 1990s, the town's population growth has leveled off during the last 20 years. Shutesbury continues to have a very low density of population relative to its geographic size.

Located in the northeastern portion of the Pioneer Valley region, Shutesbury is one of the hill towns on the eastern flank of the Connecticut River Valley and stretches 6 miles from north to south and the same distance from east to west at its widest point (see Map 1). The eastern section of town contains a portion of the Quabbin Reservoir's watershed, the main source of municipal water for the City of Boston – precluding commercial and industrial development in this large portion of the town. Unlike several of the surrounding towns, the elevation of Shutesbury, 1,225 feet at the benchmark in the center of town and 1,305 feet at the highest point, distinguishes it as an insular area of steep terrain when compared with several of the immediate surrounding towns.

Similar to other towns in Western Massachusetts, Shutesbury has witnessed a conversion from an agrarian lifestyle to a largely-residential community whose residents commute elsewhere for their livelihood. Due to the proximity of five major colleges, much of the population growth that has occurred has resulted from an influx of young professionals employed by these institutions, along with their families. Some of the newer residents have also been drawn to the area by employment at elementary and secondary schools. Although a number of multi-generational families continue to live in town – engaged in forestry and agricultural activities – this percentage of the population has decreased during the past three decades.

B. HISTORY OF THE COMMUNITY

The town of Shutesbury is commonly referred to as the "Roadtown" Community, a term derived from its original founding and very important role in the development of an historic transportation corridor. During the early portion of the eighteenth century, in the state's colonial era, a petition was filed by colonists in Lancaster, Massachusetts, to the governing body of the Massachusetts Bay Colony, to gain transportation access routes to Springfield and Hartford to provide markets for their goods. As compensation for their labor in constructing the road, the petitioners requested land.

The General Court for the Governing Body ordered a survey of a 6-square-mile tract of land along the requested route and granted the request for land subject to the following

future population, housing, agricultural and road-width requirements: (1) within 4 years, 60 families must have settled there; (2) each family must build an 18-foot square house with 7-foot high ceilings; (3) each settler must clear 4 acres for crops and 4 acres for English grass; (4) a meeting house must be built and a minister found to settle in the town; and, (5) the constructed road must be wide enough and smooth enough to be used for carts.

A final grant of the land was made to the 95 original petitioners on April 17, 1735 and signed into law on the subsequent day by Governor Belcher. Committees were formed to delineate lots and to clear and maintain the road. In addition to their labor, each family was required to pay 3 English pounds.

The tract of land granted by the General Court was larger than 6 square miles. It was actually 10 miles long (north-south) and nearly 6 miles across (east-west), including a large portion of what is now Wendell and a small part of New Salem. Because the settlement was concentrated along the road and the original settlers had constructed the road, the settlement was designated as *Roadtown*.

An important feature of the early ruling was that the governing committee for the town designate approximately 500 acres for the use of Governor Belcher. This acreage was referred to as "the Governor's Farm" and was centrally located to the south of the newly-constructed road. The Governor then deeded to the town 4 acres of land along the road "for the building of the meeting house and schoolhouse, and for a burying place and training field – "in perpetuity." The remainder of the 500 acres was divided into lots ranging in size from 40 to 60 acres. Lots were assigned to the families through a drawing, with some families receiving more than one lot.

The first lot was settled in 1739. Land was then offered for a sawmill, corn mill, gristmill and development of a meetinghouse. In 1761, the town was officially incorporated as Shutesbury to honor Samuel Shute, who had been the Governor of the Massachusetts Bay Colony from 1716 to 1723.

During the period from 1723 to 1860, school districts were established, the northern end of Shutesbury was apportioned to Wendell, and land was purchased for a cemetery. In 1811, a subscription library, called the social library, was established by residents and housed in a jelly cupboard that travelled around to the homes of subscribers. The free public library was established at Town Meeting in 1894, and the M.N. Spear Memorial Library was completed in 1902 at a cost of $1,547.61, bequeathed by Mirick N. Spear. A Methodist church was built in 1851 and the Hearse House was built in 1858.

Throughout the eighteenth and nineteenth centuries, high-flowing streams provided power and water for a variety of small mill and farming operations. Shutesbury prospered and became self-sufficient, producing its own lumber, food, clothing, shoes and hardware. This prosperity and self-sufficiency continued into the 20th century, especially due to the abundant forest resources that allowed for continuous logging activities and downstream shipping. Although farming activities were minimal, products such as corn, tobacco and butter were produced for commercial use, and apple and pear orchards were cultivated and maintained. As logging operations cleared areas for fields (Map

A1), the town's residents began haying activities and growing rye, potatoes and oats. Sawmill operations, however, were the predominant economic activity during the nineteenth century, with numerous sawmills constructed on the various waterways in town, adjacent to gristmills and cider mills. In the mid-1800s, 10 water-powered sawmills were producing lumber, railroad ties, shingles, barrel staves, laths and components for chairs and other wood products.

During the first part of the twentieth century, the town's infrastructure developed, as telephone lines were erected along the main road corridors. In 1906 and 1907, New England Telephone and Telegraph of Massachusetts started erecting poles for their wires, and the Connecticut River Transmission Company was granted permission to run wires to private residences. In 1929, Town Meeting voted to contract with New Salem Electric Company for 15 street lights, and appropriated $200 to wire the Town Hall (then located at 12 Wendell Road), the Library and the Center School (which accommodated 24 students).

In 1920, Shutesbury also had three other active schools (each consisting of one-room): West (with18 students), South (with 8 students), and Pratt Corner (with 6 students). In his 1934 Annual Report, School Union Superintendent Edwin Harriman described the Center School as being "…*far from satisfactory. The lighting facilities are poor, the ceilings being too low to allow windows of proper size to be installed. We ought to have a building with 2 classrooms, 21 X 30 feet by 12 feet high, preferably on the ground floor, and provided with furnace heat, running water and sanitary toilets*."

In 1934, the Metropolitan District Commission (MDC), the agency responsible for the construction of Quabbin Reservoir, paid the town $3,600 for the Town Farm property. Soon thereafter, in 1935 and at later Town Meetings, the town began planning for construction of a new two-room school in the town center, a new machinery building for highway and fire equipment, and a "Ladies" Rest Room at the (1829) Town House.

The human need for clean, pure water significantly influenced what Shutesbury has become. While the Metropolitan District Water Commissioners were buying up the eastern one-third of Shutesbury, the Amherst Water Commissioners were buying up the southwestern section of Shutesbury, considerably reducing the size of the footprint that would remain under the town's ownership and control. On September 3, 1930, Town Meeting approved relocation of a part of East Leverett Road at Pratt Corner (the remaining portion has since been renamed January Hills Road) for the creation of Atkins Reservoir by the Amherst Water Company.

The creation of the Quabbin Reservoir brought an immediate influx of functional, municipal capital funds, and also major and lasting change for Shutesbury. In 1935, Town Meeting voted to "*do all things reasonable to ensure the building of a first-class connecting road between Shutesbury Centre and the Daniel Shays Highway…with no cost to the town*..." and to discontinue a total of 1,150 feet of Cornwell Road (comprising one segment on each side of the Daniel Shays Highway). Although the Town of Shutesbury did not meet its demise as a result of the construction of Quabbin Reservoir (in contrast to the four other towns which we frequently hear about), our town did lose at

least 13 homes/major farms and mill properties. In addition, some of Shutesbury's best farming soil was in the Swift River Valley portion of the town that was purchased by MDC. One can still walk the remnants of Shutesbury's River Road and Enfield Road, no longer on Shutesbury's current list of roads, and see foundations, wells and other signs of homes and mill sites that were abandoned. Even more evidence of Shutesbury's lost potential lies below the surface of Quabbin Reservoir. The losses of many families and businesses of Shutesbury, Pelham and other surrounding towns went virtually unrecognized by most people, due to the more dramatic losses of the four entire towns of Enfield, Dana, Greenwich, and Prescott. However, the Shutesbury Historical Commission recognizes the sacrifices made by Shutesbury's families, despite the infrastructure improvements and monetary gains provided by the creation of Quabbin Reservoir.

Shutesbury also had economic opportunities from tourism, based on the discovery of mineral springs at Mount Mineral (which invalids visited throughout the nineteenth century). Several hotels were built in the late 1890s, and during the early twentieth century, the development of small cottages around Lake Wyola attracted people to town. By 1940, more than 60 new cottages at the lake were constructed by families from Greenfield, Springfield, Chicopee and Holyoke.

During the 1940s and 1950s, Town Meeting approvals provided funding for the purchase of land for a new school, establishment of a Fire Department and Police Department, and in 1966, the dam and water rights were acquired for Lake Wyola. Gradual expansion of town occurred during the last decades of the twentieth century and the early decades of the twenty-first century, with the development of additional roads and an influx of new residents.

C. POPULATION CHARACTERISTICS

During the period from 1740 to the start of the American Revolution, additional citizens of the Massachusetts Bay Colony moved to Shutesbury. During the period from 1765 to 1820, Shutesbury grew by 300 percent, from 339 inhabitants to more than 1,000 (Shutesbury Education Foundation, 2000). Shutesbury's population rose to 1,029 residents in 1820. A subsequent population decline commenced, resulting in only 614 residents by the 1870s and progressing well into the twentieth century. By 1940, Shutesbury's population consisted of only 191 residents. Numerous logging and sawmill operations and agricultural activities were the economic assets of the town's residents. To a lesser extent – residents also manufactured boots, shoes, baskets, rakes, brooms and palm-leaf hats (the latter for a major market in Amherst). Taverns and hotels, together with the town's spring and mineral waters, attracted residents of the Connecticut River Valley to visit the town.

In the 1860s, 10 logging companies operated in Shutesbury - this was reflected in the amount of forest cover, which was merely 20% in 1880, in contrast to the current coverage of 86%. A decline in forestry operations accompanied the decline in population that began in the latter part of the nineteenth century in Shutesbury. In addition to forestry operations, agricultural activities also severely declined; 11,000 acres of the town were

dedicated to agricultural production in 1875, with a subsequent decline to 4,000 acres by 1925. The amount of agricultural land declined even further in 1927, when the Metropolitan District Commission took the land in the eastern part of town for the creation of Quabbin Reservoir. Literature dealing with the population trends in western Massachusetts cite the "transportation and communication" developments, as well as the expansion of the University of Massachusetts, originally the Massachusetts Agricultural College (established in 1863), as the dominant socioeconomic factors in both increasing the population of Shutesbury during the twentieth century and shifting the population from citizens engaged in industrial and agrarian activities to citizens employed by the university or in service-related work. Shutesbury became an area from which people commuted to work – rather than in which they worked the land in forestry or agriculture. Shutesbury's population would remain relatively small until the 1970s and 1980s, when it started to grow again.

The 2010 U.S. Census lists a population of 1,771 for Shutesbury. This translates to a population density of 67 people per square mile, which is very low by state standards and reflects the rural character of the town. The median age in 2010 was 45.6 years old, with 42.5% of the population having ages between 45 and 64 years old. The distribution of ages in 2010 is shown in the table below.

Age Group	Total in Town in 2010
Under 5 years	82
5-19 years	347
20-44 years	438
45-64 years	751
65 and over	153

As more of the population reaches retirement age, they may spend more time in outdoor recreation, such as hiking and fishing, but may also require more facilities that are accessible to persons with disabilities. The town is fortunate to have the Carroll A. Holmes Recreation Area (a state park) at Lake Wyola, which does have accessible facilities for persons with disabilities. The one-room town library and the town hall also provide access for persons with disabilities, although are limited in the space or programs they can provide. The elementary school is also accessible to persons with disabilities and might be the most likely venue for senior activities, except it is only available on the weekends, when school is not in session.

U.S. Census Bureau's American Community Survey for 2013 estimates that the median income in 2013 was $69,722 and approximately 8.4% of Shutesbury's workers had an income below the poverty level. In 2013, Shutesbury's adult population was composed of the following races: White (92.8%), Hispanic/Latino (2.8%), African American (0.3%), Native American (0.2%), Asian (1.2)% and mixed race (2.7%). In Massachusetts, Environmental Justice (EJ) is based on the principle that all people, regardless of

income, ethnicity, gender or disability have a right to be protected from environmental pollution, and to live in and enjoy a clean and healthy environment. In Shutesbury, all residents have equal access to the open space and recreational areas, and the clean and healthy environment that exists throughout town. The town has no EOEEA-designated EJ areas.

D. GROWTH AND DEVELOPMENT PATTERNS

Patterns and Trends

As a hill town in eastern Franklin County, Shutesbury's historically-rural development patterns have been strongly tied to its topography. With elevations over 1,000 feet, Shutesbury's cooler climate and poorer soil conditions did not support the intensive agriculture that provided communities within the Connecticut River floodplain a foundation for larger populations. From the late 1700s through the 1800s, Shutesbury's upland terrain provided conditions suitable for mills and wood production. Streams, brooks, and ponds, carrying water that flowed off the highland divide between the Connecticut and Swift River basins provided power for sawmills and corn mills. (Map A2). The town's forests helped to fuel these local mills as well as others in Greenfield. Shutesbury was Franklin County's highest producer of broom handles in 1845 (Shutesbury Master Planning Committee, June 2004).

The current land-use patterns in Shutesbury (Map C) greatly reflect its recent history and follow historic land-use trends in the region. Like other upland, hill town communities in the region, Shutesbury's population experienced a decline in residents from the early 1800s to the early to mid-1900s. A large influx of new residents seeking good schools and nearby job opportunities caused Shutesbury's growth to increase rapidly between 1970 and 2000 (Shutesbury Master Planning Committee, 2004).

The figures listed in Table 1 (below) indicate rapid population growth during the 1970s and 1980s, with a declining growth rate in the 1990s and the first decade of the twenty-first century. These figures are based on U.S. Census Survey data from surveys conducted every 10 years.

Table 1. Shutesbury's Population and Percent Change in Population from 1970 to 2010

	1970	1980	1990	2000	2010
Population	489	1040	No census conducted	1621	1771
% Change from Previous Measured Year	**N/A**	**113% increase**		**59% increase**	**9% increase**

(Source: U.S. Census data from 1970, 1980, 2000 and 2010.)

The 2000-2005 Shutesbury Open Space and Recreation Plan predicted a population increase to 2,937 residents, based on population trends determined by the Massachusetts Institute for Social and Economic Research (MISER) during August 1999 (Shutesbury Open Space Planning Committee, 2000). Subsequently, the Town of Shutesbury issued its Master Plan in 2004. Based on the large increase in population from 1970 to 1998, it was projected that the town's population would increase to 2,600 by the year 2025, resulting in a net gain of 800 residents and an estimated 320 new dwelling units constructed. These estimates were based on an assumption that the past two decades of growth would continue, due to anticipated future job opportunities within both Franklin and Hampshire Counties. Although the expansion of the University of Massachusetts and the development of Hampshire College during the 1970s (both in the Town of Amherst) did result in population increases, the largest degree of development occurred within the southwestern portion of Shutesbury, closest to Amherst. Larger, single family residences characterized this growth, with a greater density of population growth immediately adjacent to the Town of Amherst's surface water supply, Atkins Reservoir.

The above projections have not been met, and the slower rate of growth is consistent with trends published in 2006 for most of Western Massachusetts (Daily Hampshire Gazette, July 8, 2008). Many factors have likely contributed to the reduction in population growth from that previously forecasted. Probable factors leading to the leveling off of population growth include:

1) An increase in transportation costs to this rural community, coupled with the lack of public transportation from Shutesbury to either the Amherst area or the Town of Greenfield. Only 14.9% of Shutesbury's residents work in town, with less than 1% involved in forestry or mining activities, and the largest portion of the remaining residents with town-based employment working at the elementary school;

2) A lack of housing accommodations for middle- and lower-income families, coupled with a large increase in the average property tax in Shutesbury;

3) A general reduction in families with children entering the town's elementary school, as the "baby-boomer" generation has aged beyond child-bearing years; and,

4) A lack of technological infrastructure in town (i.e., no high-speed Internet access) or cell phone reception, which has reduced opportunities for home-based businesses, the capabilities of students to obtain information required for school work and the ability of residents to communicate in an era in which Internet access has become essential for communication.

The reduction in the school-aged population in Shutesbury reflects a general trend across Western Massachusetts. Numerous discussions have been ongoing both within and between many towns concerning reduced school budgets, reduced school enrollment, potential school closures and regionalizing existing schools. Many town budgets show an increased percentage of available funds being allocated to the school

systems, thereby increasing the per capita cost of elementary and middle school education and reducing the availability of town funds for other services and capital infrastructure.

Infrastructure

Shutesbury has 42 miles of roads, according to the Massachusetts Department of Revenue's February 16, 2011 report titled *At a Glance Report for Shutesbury*. According to the Pavement Management Study Scenario 2 by the Franklin Regional Council of Governments (June 2004), there are 31 miles of town-maintained roads; 15 miles of paved roads and 16 miles of gravel roads (Map D). The paved roads are Route 202 and most of the main routes through town (Leverett Road, part of Cooleyville Road, part of Wendell Road, Locks Pond Road, Lake Wyola Road, Pelham Hill Road, West Pelham Road, January Hills Road, and Weatherwood Road). Route 202 is a north-south trending state highway that runs along the eastern side of town and is a major transportation route for traffic traveling from the area to points to the north and east (such as Boston). There are a number of private gravel roads, especially around Lake Wyola, and a few gravel roads in the Quabbin watershed lands maintained by DCR. There are no bicycle lanes or sidewalks in town, but the roads are frequently used by both bicyclists and pedestrians, and occasionally by those riding horses.

There are six public water supply wells in town, with most homes being on private wells. There is no municipal sewer service in Shutesbury, which means that everyone has a private septic system to maintain. The Board of Health does a careful job of making sure new septic systems and wells are properly separated from one another. There has been discussion over the years about constructing a small community wastewater treatment plant in the area of Lake Wyola to service the dense development of cottages and year-round houses around the lake that have shallow wells and are located on poor soils with a high water table. An additional small community wastewater treatment plant is under consideration for the center of town. The feasibility and success of such community systems would be dependent on finding areas suitable to construct soil absorption fields and on the continued vigilance of participating residents in maintaining their pumps. There is more discussion on sewage disposal issues in Section 4 (*Environmental Challenges*).

Long-Term Development Patterns

The bedroom community that Shutesbury is today is in stark contrast to the cottage-industry rich, farming and forestry community that it was in the late nineteenth and early twentieth centuries. There are no formal shops, restaurants, gas stations, industries, etc., and only a handful of town-based businesses: such as a car repair shop; a law office; a small gravel-mining operation/junkyard; a children's summer camp and conference center (Pine Brook); a small facility offering a ropes course, teambuilding programs and children's summer camp (Morse Hill); the Shutesbury Athletic Club; and, of course, the Saturday Farmer's Market. Most people travel considerable distances out of town to get to work every day. This change in Shutesbury's industries and

businesses, and in the occupations of its residents, is reflected in the data from U.S. Census Bureau's American Community Survey for 2013. The U.S. Census Bureau estimates that in 2013, 88.7% of the residents commuted to work (with a mean commute time of 28 minutes), 9.1% of the population worked at home and the remaining 2.2% are employed as town employees (i.e., at Town Hall, the Highway Department, the Library or the Shutesbury Elementary School).

The Master Planning Committee developed and approved land-use and zoning goals in January 2002. The Land-Use and Zoning chapter included an evaluation of ways Shutesbury's land-use and zoning policies could be revised to better support the town's goals and vision for its future. The Master Plan proposed creating new zoning districts, including a Town Center District; a Water Supply Protection Overlay District for the Atkins Reservoir, Dean Brook and Nurse Brook Sub-Watersheds; a Forest Conservation Overlay District; and a Lake Wyola Sub-Watershed Overlay District. After a long process of drafting the bylaw and responding to public and private concerns about the impact on land use and values, the Water Supply and Watershed Protection Districts for Atkins Reservoir and Lake Wyola were not included, although there is a Lake Wyola District. The new Town of Shutesbury Zoning Bylaw (a.k.a. the Open Space Design Zoning Bylaw) was approved in 2008 and put into effect in 2009 (Map 3). The Open Space Design component of the bylaw (Article V) changed the zoning from one Residential-Agricultural District for the whole town to zoning that contains four districts (Forest Conservation, Roadside Residential, Town Center and Lake Wyola) with "a conservation component, ensuring that every new development project that otherwise would be a conventional subdivision will result in the permanent preservation of at least 65% to 80% of the land as open space" (Town of Shutesbury web site "Understanding Open Space Design"). The purpose of the new zoning is described in Section 1.1 of the bylaw as "protection of large contiguous tracts of forest land to maintain commercial forestry as a viable agricultural activity; the protection of water in the watersheds that supply drinking water to Amherst, Massachusetts, the Boston metropolitan area, and the Town of Shutesbury; the maintenance of a rural road system that includes many miles of unpaved roads; the protection of significant wildlife habitat in a healthy forest ecosystem; the allowance for mixed-use development in the Town Center area; the diversification of available housing types; greater affordability in housing; economic opportunities for residents including home-based businesses; and the clustering of residential development in compact settlements leaving large areas of open space undeveloped" (Shutesbury Planning Board, 2008).

SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS

A. GEOLOGY, SOILS AND TOPOGRAPHY

Geology

Bedrock Geology

The Bedrock Geologic Map of Massachusetts (E-an Zen, et al., 1983, published by the United States Geologic Survey) indicates that the bedrock of Shutesbury lies east of the Triassic-aged Connecticut Valley Border fault, and most of town is underlain by the rocks of Pelham Dome. The Pelham Dome consists of the Proterozoic Z-aged metamorphic gneisses, schists, amphibolites and quartzites of the Dry Hill Gneiss and Mount Mineral Formation. Originally sedimentary rocks, these formations were transformed by the high pressure and temperature conditions associated with the collision of the Earth's tectonic plates. A portion of the Bronson Hill Anticlinorium (a large fold in the Earth's crust) underlies the eastern edge of town along the West Branch of the Swift River and Quabbin Reservoir. The Bronson Hill Anticlinorium contains the gneisses and amphibolites of the Fourmile Gneiss and Monson Gneiss (of Ordovician, Cambrian or Proterozoic Z age), the schists and amphibolites of the Partridge Formation (Middle Ordovician age), and the schists and phyllites of the Littleton Formation (Lower Devonian age). In the southeastern corner of town, the older rocks of the Bronson Hill Anticlinorium are intruded by Jurassic-aged diabase dikes and sills (formations associated with volcanic events). Map 4A provides a simplified, generalized depiction of bedrock geology in Shutesbury. On Map 4A, the units from the *Bedrock Geologic Map of Massachusetts* have been grouped together, based on similarities in predominant mineral composition, origin (volcanic, intrusive igneous or metamorphic) or, in some cases, similar structural characteristics/integrity. For example, on Map 4A, most of Shutesbury is represented as being underlain by a unit identified as "granite, other." This rock material actually consists of the metamorphic gneisses and quartzites of the Pelham Dome and Bronson Hill Anticlinorium rather than units of intrusive volcanic origin, such as granites. Most information concerning geologic history and specific unique mineralogies is not represented on this simplified map, however, this is the only map that is currently available in a digitized form for Shutesbury. In addition, this more simplified map is more readily understandable to non-geologists.

Surficial Geology

Detailed surficial geologic mapping for Shutesbury was done in 1978 by Janet Radway Stone and presented in a preliminary map entitled *Preliminary Map of Surficial Deposits in the Shutesbury Quadrangle, Massachusetts* (United States Geological Survey (USGS) Open File Report 78-285). At the same time, Ms. Stone also mapped the northernmost section of Shutesbury that is located in the Wendell quadrangle. Much more recently (in 2010), the results of this mapping effort have been published in a document entitled *Surficial Geologic Map of the Heath-Northfield-Southwick-Hampden*

24-Quadrangle Area of the Connecticut Valley Region, West-Central Massachusetts. However, the original preliminary map for the Shutesbury Quadrangle still contains the most detailed, Shutesbury-specific descriptions of the surficial geology. The surficial geology in Shutesbury consists mostly of glacial till that blankets the bedrock in a layer ranging from 0 to 50 feet in thickness (Map 4B). However, bedrock has been estimated to be less than 10 feet from the surface at numerous locations on the higher, steeper hills, particularly those in the eastern half of town. In this section of town, bedrock is present at the surface in numerous outcrops and ledges.

Glacial till is a non-sorted, non-layered mixture of materials of all grain sizes: clay, silt, sand, pebbles, cobbles and boulders. The till is light gray, loose and extremely sandy, with few stones and boulders. However, in some areas, the looser till is underlain by a darker, fine-grained compact till. The till layer is generally thicker on the northern and western sides of hills and thinnest or absent on the southern and eastern sides of hills.

The sorted, layered deposits of glacial stratified drift (consisting of gravel, sand, silt and clay deposited by glacial meltwater streams) are found mainly in and along principal stream valleys and basins where they overlie till. Stratified drift deposits are found along the West Branch of the Swift River and Baker Brook, and around Ames Pond, Lake Wyola and Atkins Reservoir. These deposits in Shutesbury are much thinner than they are in the Connecticut Valley, therefore, opportunities for gravel mining operations are relatively limited in town, as opposed to areas in towns such as Sunderland, where thick kame and deltaic deposits exist. The sands and gravels found in the Dean Brook Valley, the Roaring Brook Valley, Dudleyville Marsh, Moore's Corner Basin, and the South Brook Valley are lacustrine deposits that formed in temporary small glacial lakes and ponds. These deposits become finer in grain size with depth. The sand and gravel deposits in all of these areas range from 0 to 50 feet in thickness.

The remaining surficial geologic deposits are modern stream alluvium and swamp deposits. Modern alluvium is found in the major valleys, such as Roaring Brook and the West Branch of the Swift River and consists of a range of grain sizes from well- to poorly-sorted gravel to sand and silt, with variable amounts of organic matter. Swamp deposits are found in minor amounts around Dudleyville Marsh, Lake Wyola, and Baker Reservoir, and in other scattered isolated areas. Swamp deposits are usually less than 10 feet thick and consist of dark, decomposed organic matter that is interlayered with sand, silt and clay. Map 4B provides a generalized depiction of glacial deposits in Shutesbury. The map units from the *Preliminary Map of Surficial Deposits in the Shutesbury Quadrangle, Massachusetts* have been combined somewhat on Map 4B, because some of the detail in the preliminary map has been lost at the smaller scale allowed in maps available from the MassGIS, and a more simplified map is more readily understandable to non-geologists. This map is all that is currently available in digitized form for Shutesbury.

Soils

Soils in Shutesbury owe their characteristics to the glacial deposits from which they were derived. All information on the soils in Shutesbury was obtained from the 1967 U.S. Department of Agriculture, Soil Conservation Service publication titled *Soil Survey, Franklin County, Massachusetts*. Although all but two soil surveys for Massachusetts had been updated in recent years, the update for Franklin County (including Shutesbury) was not available at the time of plan writing. In addition, mapped soils information for Franklin County was not available in digital format from the Mass GIS database (as of early 2012, when the plan was issued for review and public comment). The 2000 soils map from the previous Shutesbury Open Space and Recreation Plan was used here (Map 4C). Most soils in Shutesbury are shallow-to-bedrock, contain stones, and either are poorly-permeable or saturated, or are highly permeable, yet contain a nearly-impermeable, fragipan layer close to the surface. All of these characteristics make them less-than-ideal candidates for housing uses (including standard septic system installations), and better suited for forests, pasture, and, in some cases, crop land (Map 4C). The Natural Resources Conservation Service (NRCS) has classified all but 143 acres or 0.8% of the land in Shutesbury as containing soils having severe limitations for building, including the construction of septic system absorption fields. Excessively-slow or excessively-fast percolation rates, steep slopes, shallow depths to bedrock, the presence of abundant stones and shallow depths to the water table are the reasons for the NRCS classification of "severe limitation." While, in most cases, these problems can be overcome by constructing raised-bed or oversized leach fields, the need for these measures may limit the extent of future development in town.

NRCS has classified approximately 670 acres or 4% of the land in Shutesbury as having Prime Farmland Soils, on the basis of having optimum drainage, permeability and moisture-holding capacity, temperature, length of growing season, slope and pH; acceptable salt and sodium content, and a minimal number of stones. Prime Farmland Soils have the best combination of physical and chemical characteristics for producing an economically-sustained, high yield of food, feed, forage, fiber and oilseed crops when managed according to acceptable farming methods, including water management. Such soils are not excessively erodible or saturated with water for a long period of time and do not flood frequently (U.S. Department of Agriculture (USDA) Soil Conservation Service, 1993). In Shutesbury, these are generally Merrimac, Sudbury, and Scituate soils. An additional 3,474 acres or 20% of the land is classified as having Farmland Soils of State and Local Importance, due to their possession of most, but not all, of the same characteristics as the Prime Farmland Soils. For example, these latter soils often contain a greater number of stones or lie on terrain having greater slopes. Almost all of the farmland soils are presently forested. Many are sandy, stony, and/or sloping, and are better suited for orchards, vineyards, hay, or pasture than high-yield cropland.

The Commonwealth has also mapped Prime Forestland, based on soil productivity and wetness characteristics. Potentially-forested land was classified into nine categories established by the U.S. Department of Agriculture: Prime I, II and III, Prime III wet, Statewide Importance and Statewide Importance wet, Local Importance and Local Im-

portance wet, and Unique. Aspect, land cover, slope and hydrology were also considered in the mapping. The top three categories of productive forest land were called Prime I, II and III. Prime I, II, and III Forestland Soils occupy 12,352 acres or 72% or the total land area in Shutesbury and support production of white pine wood fiber at a rate greater than 85 cubic feet per acre per year, and northern red oak wood fiber at a rate greater than 40 cubic feet per acre per year. These soils are important for commercial forest management. Prime I and II Forestland Soils are found mostly in the Connecticut River Watershed west of Wendell Road, while Prime III Forestland Soils are found in the Chicopee River Watershed. Prime I Forestland Soils are comprised mainly of Ridge-bury Soils and cover 690 acres or 4% of the land in Shutesbury. Prime II Forestland Soils cover 3,412 acres or 20% or the land surface and are composed of Gloucester, Sudbury and Merrimac soils (Shutesbury Master Planning Committee, 2004).

The primary soil association in town is the Shapleigh-Gloucester-Essex Association. These soils are widely distributed and occur at elevations ranging from 500 to 1,200 feet on forested, rolling, stony and rocky hills. They are shallow to deep, well-drained soils that formed in the sandy, stony glacial till of the uplands. These droughty, rocky, low-fertility soils are more suitable to forestry uses than to farming. In Shutesbury, this soil association is represented by Shapleigh, Essex, Gloucester, Scituate and Ridgebury soils.

Shapleigh Soils are widely distributed throughout town and are found on the tops of the major, higher elevation ridges and hills, including Morse Hill, Ames Hill, Mount Mineral, Beech Hill, and in the January Hills. They are also found in certain areas along Atherton Brook, Nurse Brook, Osgood Brook and Town Farm Brook. Shapleigh Soils are shallow, excessively-drained to somewhat excessively-drained soils occurring on steeper slopes (15 to 60%) that contain many rocky ledges or outcrops and where the depth to bedrock is generally less than 2 feet. These soils are fine sandy loams that are moderately- to rapidly-permeable, but have low moisture-holding capacity due to their shallowness. They are also low in organic content, extremely- to moderately-acidic and subject to erosion. Due to their droughty nature, these soils are not good for agricultural uses and are mostly covered with forest or pasture. These soils are also poor for siting septic systems and for constructing building foundations, due to the shallow depths to bedrock and the steep slopes.

Essex Soils are widely distributed throughout the eastern two-thirds of town. They are found on the side and lower slopes of the steeper, higher-elevation ridges and hills, and in some of the flatter lowlands between hills, including the areas in the northeastern corner of town, east of West Pelham Road, east and west of Wendell Road, east of Town Farm Brook, along Rocky Run, and southwest and northeast of Lake Wyola. These are deep, well-drained, sandy loams and loamy sands containing some stones and boulders that occur on slopes ranging from 15 to 45%. Although these soils are moderately- to rapidly-permeable and have a high moisture-holding capacity, they also have a compact, fragipan layer at 1.5 to 2.5 feet which restricts root growth and the vertical movement of water due to its low permeability. The fragipan layer also has a low-moisture-

holding capacity. Bedrock in these areas ranges from depths of only 3 feet to up to 20 feet, but high groundwater is relatively shallow, existing at depths of 3 to 5 feet below the surface. These soils have a very low organic content and are strongly- to slightly-acidic. They are good for the following uses: forest, pasture, dairy farming and orchards. However, if these soils are under cultivation, erosion control measures need to be put in place. The presence of the fragipan layer and the steep slopes on which these soils often occur make them poor for siting septic systems and building foundations.

Gloucester Soils occur on slopes ranging from 8 to 25% and are found on the upper slopes of some of the major ridges and hills in town, such as in the January Hills area, on Poverty Mountain, in The Plains, in the area along the Leverett border extending from The Plains north past the Dudleyville Marsh, around Atkins Reservoir, in the area southeast of Mount Mineral, in an area straddling the intersection of Locks Pond Road and Wendell Road, and along Pelham Hill, West Pelham and Baker Roads. These soils are well-drained to excessively well-drained, fine sandy loams underlain by loamy sands that contain many stones and boulders. The substratum of these soils is often firm to very firm at depths ranging from 2.5 to 5 feet. They have slow to moderately-slow permeability and low organic content and are extremely- to moderately-acidic. Bedrock lies at depths of 3 to 20 feet and high groundwater ranges in depth from 3 to 5 feet below the surface. These soils can be used to grow row crops and forage crops and for orchards, but are droughty, so irrigation is required. These soils also can be subject to erosion when under cultivation. The stoniness of these soils and the steeper slopes on which they occur make these soils poorly suited for the construction of septic systems and building foundations.

Scituate soils are found on some of the lower slopes of ridges, in some river valleys and in some of the flatter areas between rolling hills in town, including The Plains, the area between Montague and Locks Pond Roads, and areas along Nurse Brook, Roaring Brook, Baker Brook, Dean Brook, Town Farm Brook, Atherton Brook, Adams Brook, and Osgood Brook. These well-drained, deep, fine sandy loams occur on 3 to 15% slopes. A fragipan layer exists at 1.5 to 2.5 feet. Above the fragipan layer, the soil is moderately- to rapidly-permeable and has a high to moderate moisture-holding capacity. Scituate soils are strongly- to moderately-acidic. Bedrock in these areas ranges in depth from 3 to 20 feet below the ground surface and high groundwater is very shallow, at a depth of 1.5 feet. Due to the high water table and the presence of the fragipan layer, these soils remain saturated until late spring, hence, drainage is required in order to grow corn, silage, and hay or to use areas underlain by Scituate soils for pasture. Under cultivation, erosion controls are necessary and stones must also be removed to make the soils suitable for planting crops. These soils are also suitable for forest uses, however, they are not suitable for the construction of septic systems or building foundations, due to the presence of the high water table, fragipan layer and steeper slopes.

Ridgebury soils are found along the valley floors and at the headwaters and tributaries of Dean Brook, Nurse Brook, Baker Brook, Roaring Brook, Rocky Run, Town Farm

Brook, Cobb Brook and Osgood Brook. Ridgebury soils are also found in a north-south strip lying east of Dudleyville Marsh and Morse Hill, along Tyler Brook and along the portion of the West Branch of the Swift River that lies north of Mount Mineral Road. Ridgebury Soils are poorly-drained, deep, fine sandy loams. These soils are strongly- to moderately-acidic, have moderate to high organic content and contain stones and boulders. Soils closer to the surface are moderately- to rapidly-permeable and have a high moisture-holding capacity, but a fragipan layer is present at depths of 1 to 2.5 feet. High groundwater is present at or very near the surface, to a maximum depth of 1 foot, so these soils remain saturated for 7 to 9 months of the year. Bedrock ranges in depth from 3 to 20 feet. These soils are not suited to the construction of septic systems or building foundations, due to the shallow groundwater and the presence of the fragipan layer, but may be used to grow silage or hay, if drainage is provided. These soils also support the growth of forests.

The Hinckley-Merrimac Association soils are much less abundant than the Shapleigh-Gloucester-Essex Association soils and occur at elevations ranging from 500 to 700 feet. These soils are droughty to somewhat droughty, sandy and gravelly soils that are found on nearly-level to gently-sloping terrain. These soils formed on outwash plains and on stream terraces in deep deposits of sand and gravel and are most suitable for housing, forestry, dairy farms and truck farms. This soil association is represented by Hinckley, Merrimac and Sudbury Soils. The related Hinckley-Windsor-Merrimac Association is represented by Hinckley, Merrimac, Carver, Walpole and Wareham, Windsor, and Scarboro soils in Shutesbury. These latter soils occur at elevations ranging from 130 to 350 feet on terraces separated by short, steep escarpments. These soils are droughty and somewhat sandy and have formed in deep, sandy and gravelly deposits, such as those deposited by glacial meltwater streams. These latter soils are most suitable for housing and agriculture.

Hinckley soils are found mainly in the upper and lower portions of valleys in the northwestern, eastern, west-central, and southwestern sections of town. These soils are found along Tyler Brook, Roaring Brook, Dean Brook, the upper portion of the West Branch of the Swift River east of Beech Hill, the lower one-third of the West Branch of the Swift River and a portion of its main tributary, the upper portion of Osgood Brook, and the lower portion of Atherton Brook. Hinckley soils are also found around the eastern, southern, and western edges of Ames Pond; along the western and eastern edges and northeast of Lake Wyola; north of Atkins Reservoir; west of Wendell Road at Carver Road; and along the western shore of Quabbin. They are excessively-drained, coarse-textured, sandy and gravelly, sandy loams that occur on slopes ranging from 3 to 35%. They are rapidly-permeable, have a low moisture-holding capacity and are moderately- to very strongly-acidic. A gravelly, cobbly substratum is present at depths of 1 to 1.5 feet, bedrock is present at depths greater than 10 feet, and high groundwater is present at depths from 3 to 5 feet below the surface. These soils support forests that provide good wildlife habitat and are also well suited to building foundation and septic system construction if the slopes are not too great. However, irrigation and erosion controls are needed to grow crops or hay, or for use as pasture land.

Merrimac soils are limited in distribution in Shutesbury. The largest acreage of Merrimac soils is found along the West Branch of the Swift River and its major tributary in the northeastern one-third of town. Merrimac soils are also found south and northeast of Atkins Reservoir, along the portion of Dean Brook that is located east of Pratt Corner, and in the area between Ames Pond and the Footit Bog. These soils are fine sandy loams or sandy loams that are found on slopes ranging from 3 to 15%. They are excessively well-drained, moderately- to rapidly-permeable, and extremely- to moderately-acidic. These soils have low moisture-holding capacity and a low organic content. A coarse sand or gravel layer is present at depths ranging from 1.5 to 3 feet, bedrock is present at depths greater than 10 feet, and high groundwater is present at depths from 3 to 5 feet or more below the ground surface. These soils are usually good for housing and septic system uses and good for intensive farming of tobacco, corn, forage, alfalfa and truck crops.

Sudbury soils are found only on nearly-level terraces near fast-flowing streams along the West Branch of the Swift River, Roaring Brook, Adams Brook, Dean Brook, the Sawmill River, South Brook, and at the northwestern edge of Lake Wyola. These soils are moderately well-drained, fine sandy loams that are underlain by gravel and cobbles at depths of 2 feet. Bedrock is found at depths greater than 10 feet and high groundwater is 1.5 to 2 feet below the surface in winter and early spring. The seasonal shallow groundwater table makes these soils poor locations for the construction of septic systems and building foundations, and drainage is needed for growing row crops. However, these soils are well suited for growing hay or as pasture, without any drainage requirements.

Carver soils are found on 3 to 25% slopes in isolated patches along valleys and in lowlands in the following areas: north of Atkins Reservoir, northwest and west of Lake Wyola, southwest of Mount Mineral, and along Dean Brook, Roaring Brook and Baker Brook. These soils are excessively-drained, loamy coarse sands that are underlain by coarse sands at depths of 1.5 to 2 feet. They are rapidly-permeable, have a low moisture-holding capacity and are moderately- to strongly-acidic. Plant nutrients leach rapidly and organic matter is quickly depleted from these soils and they are subject to wind and water erosion, when present on unprotected slopes. Bedrock is found at a depth of 20 feet and high groundwater is found at depths greater than 5 feet. On steeper slopes, these soils are poorly suited to the construction of septic systems and building foundations. Irrigation is needed to grow truck crops, tobacco, corn and alfalfa. These soils support forests that provide good wildlife habitat, but few trees of commercial value grow naturally on them.

Walpole and Wareham soils are very limited and scattered in distribution in Shutesbury. These soils are found in the low-lying areas north and west of Atkins Reservoir, on the Leverett border south of Roaring Brook, along Roaring Brook west of the intersection of Montague Road and Leverett Road, along Dean Brook just east of Pratt Corner, in the area between the northeastern corner of Lake Wyola and the northwestern end of Ames Hill, and along a portion of the main tributary to the West Branch of the Swift River that lies north of the border with New Salem. These soils are deep, poorly-drained, fine

sandy loams that formed in depressions or gently-sloping areas on glacial outwash or stream terraces. They are underlain by silt, clay, sand or sand and gravel at depths of 1.25 to 3 feet. They are moderately- to rapidly- permeable, have a moderate to high moisture-holding capacity, have a moderate organic content and are strongly- to slightly-acidic. Bedrock is found at depths greater than 10 feet and groundwater is found at or near the surface (to a depth of 1 foot) for 7 to 9 months of the year. Because they are so poorly-drained, these soils are unsuitable for the construction of septic systems or building foundations or for growing row crops. However, they are good for growing hay and for pasture land and support the growth of forests.

Windsor soils are found in just one area of town in the lowlands between Mount Mineral and Ames Pond. These soils are excessively-drained, droughty, loamy fine sands that consist of 2 feet of loamy fine sand over sand. Gravel may be present at depths of 4 to 5 feet. Bedrock lies at depths of more than 10 feet and high groundwater lies between 3 and 5 feet below the surface. These soils are rapidly-permeable and have a low moisture-holding capacity, so they require irrigation and the addition of fertilizer and lime for growing truck crops, tobacco, corn and alfalfa. They also support forest and provide wildlife habitat. Windsor soils are also suitable for the construction of septic systems and building foundations.

Scarboro soils are found only in a few, small, low-lying areas north and southeast of Atkins Reservoir, and northwest and southeast of Lake Wyola. These soils are rapidly-permeable, but very poorly-drained, fine sandy loams that have formed in glaciofluvial plains and terraces or in low, flat areas. They consist of 1 foot of sandy loam or fine sandy loam underlain by 1 foot of sand to sandy loam, which is, in turn, underlain by sand and gravel. Bedrock is present in these areas at depths exceeding 10 feet. The high water table is at the surface for most of the year, making these soils unsuited to the construction of septic systems or building foundations. If drainage is provided, Scarboro soils may be used for pasture or growing hay, however, fertilizer and lime must be added. In the absence of drainage, these soils will support forest and limited grazing, and provide wildlife habitat.

There are also a few other types of soils found in very limited distribution and abundance in town. Muck soils are found at and northeast of the Footit Bog, and at the headwaters of Tyler Brook, Rocky Run, and Roaring Brook. Peat soils, indicative of acidic bog conditions, are found in the following areas: south of Baker Reservoir, between Atherton Brook and Cobb Brook in the southeastern corner of town, at the southern end and northeast of Dudleyville Marsh, at the southeastern edge of Lake Wyola, at the northeastern edge of Ames Pond, and at the headwaters of Osgood Brook, Camel Brook, and the West Branch of the Swift River. In addition, a single small area of Agawam soils is found north of Dudleyville Marsh, and the Adams Brook Valley contains small areas of Ondawa, Podunk and Rumney soils. All of these soils are fine, sandy loams.

Topography

The topography of Shutesbury (Map 5) has been shaped throughout geologic history by a series of tectonic, glacial and erosional events. Shutesbury is located in the hills east of the Connecticut River Valley and elevations vary from 350 feet above sea level in the southwestern corner of town near Atkins Reservoir, to over 1,000 feet in the January Hills area, to 1,225 feet at the Town Center, to a maximum of 1,305 feet at a location 2 miles north of the town center on Wendell Road. A north-south trending ridge occupies the eastern half of town and slopes gently north to Lake Wyola and gently south to Pelham. This ridge creates the watershed divide between the Connecticut River Watershed on the west and the Chicopee River Watershed on the east. Along the entire eastern side of this ridge, the elevation drops 500 feet to the West Branch of the Swift River and Quabbin Reservoir. This area contains many brooks, streams and marshy areas which are part of the headwaters of the Quabbin Reservoir, including the West Branch of the Swift River, Cobb Brook, Atherton Brook, Camel Brook, and Rocky Run. In the northeastern section of town, between Macedonia and New Boston Roads, this ridge splits into two north-south trending ridges. From this steep, eastern ridge, the land slopes continuously and more gradually to the west. The central section of town contains areas of flats and gentle, rolling hills that slope to lower elevation areas at both the northern and southern sections of town. Lake Wyola and Ames Pond are found in the northern section and Baker Reservoir is found in the southern section. The western section of town contains more pronounced hills, including The Plains and January Hills. Roaring Brook, Dean Brook, Nurse Brook, Adams Brook, drain this area of town, flowing west towards the Connecticut River. Atkins Reservoir is located at the extreme southwestern corner of town. The topography of Shutesbury is characterized by hills averaging 400 feet in elevation and steep-sided stream valleys in the eastern and western sections of town.

B. LANDSCAPE CHARACTER

Shutesbury's landscape is largely composed of steep, heavily-forested ridges that slope to the east in the eastern part of town, rolling, wooded hills and flats in the central and western parts of town and abundant interspersed areas of forested and non-forested wetlands. Forested areas (in both uplands and wetlands) cover approximately 90% of the town's acreage and a high percentage of this land is contained in protected watershed lands associated with the Quabbin Reservoir, the 729-acre Shutesbury State Forest, the 40-acre Lake Wyola State Park, and several town-owned conservation areas (including South Brook). The protected Quabbin Reservoir lands provide fishing, nature-watching and hiking opportunities, as well as some archeological resources that are remnants of several former towns that had to be abandoned in the 1930s to allow the construction of Quabbin Reservoir. Wetlands cover approximately 6% of the land surface and pasture and crop land occupies less than 1% of town. Two long-distance trails traverse the southwestern corner of town: the Robert Frost Trail and a section of the Metacomet-Monadnock Trail (Map 5). These trails, as well as a number of others on both town- and privately-owned land, provide hiking, nature-study, mountain biking, cross-country skiing, snowshoeing and snowmobiling opportunities.

Residential development is currently limited to approximately 5.5% of the town's surface area. Because of the large areas of protected open space that occupy the eastern half of town, residential development is concentrated in the western half of town in the following areas: in the town center (an area that possesses an authentic and increasingly rare old New England charm), around Lake Wyola (an area having the highest residential density), in the January Hills area and along the following major roads: Leverett, Wendell, Locks Pond, Montague, West Pelham, Pelham Hill, and Baker.

Guiding and directing growth to those areas most suitable for development, while protecting forest and wetland areas, is an important step in realizing the goal of desirable growth, while at the same time protecting and preserving open space and natural resources. Most of Shutesbury's rural town roads are lined with stone walls and forest, with occasional houses. The scenic nature of these roads is one of Shutesbury's most important assets and contributes greatly to the town's appealing rural character, an attribute that seems to be very important to current residents (as indicated in the 2006 Open Space and Recreation Survey) as well as in attracting new residents. Designation of some or all of the town's byways as Scenic Roads (under the Public Shade Tree Act (MGL Ch. 87 §1) and the Scenic Roads Act (MGL Ch. 40 § 15C)) could, in part, help to guarantee the long-term maintenance of Shutesbury's rural character, although paving and widening are issues of continued debate.

The town has 10 fully- or partially-paved roads, including the continuous stretch of Leverett, Cooleyville and Prescott Roads and state highway Route 202, that is located in the eastern section of town. The remaining roads are well-maintained dirt roads (Map D).

In 2008, MassHighway (now MassDOT, Highway Division) completed a major road improvement project through the middle of town, including a good portion of Leverett, Cooleyville and Prescott Roads. This project was part of a special new program called the "Footprint Road Project" which allowed the community to upgrade these major roads without having to widen them to meet current state standards, which would have created an uncharacteristically-wide road through the most historic section of town. Without this special program to maintain the narrow width of the existing roads, it is very doubtful that residents would have approved the project. The work included significant changes to the road drainage, the addition of asphalt curbing, and the leveling off of some of the road near the Town Common to improve visibility and safety.

C. WATER RESOURCES

Surface Water

Shutesbury benefits from a diversity of water bodies, streams and wetlands that provide wildlife habitat, contribute to public water supplies, provide recreational opportunities, and enhance the town's aesthetics and natural landscapes (Map 6). The town's residents clearly consider the protection of water resources as being a high priority, as is evidenced in responses given to the town's 2006 Open Space and Recreation Survey.

When asked, in Question 1, how important air/water quality was in their decision to live in Shutesbury, 124 out of 181 respondents (or 68.5%) rated it "very important." Similarly, in response to Question 2, when asked how they felt about protecting a number of different natural, historic, and scenic resources, 146 out of 183 respondents (or 79.8%) rated it "very important."

During the town's early development, water was used to power the many small mills which operated in Shutesbury. The mills have since disappeared, but the water still serves as a valuable resource for the people of Shutesbury, Amherst, and others as far away as Boston. Two public agencies now have direct interests in maintaining the high quality of water in the Quabbin Reservoir and Atkins Reservoir. Large areas of town are owned and maintained as protected watersheds by the Division of Water Supply Protection of the Massachusetts Department of Conservation and Recreation (DCR) and the Town of Amherst. In addition to three large lakes, there are several ponds, numerous beaver impoundments and a number of streams in Shutesbury.

Surface water in the western half of town is part of the Connecticut River Watershed, drains to the west, and is composed of the Adams Brook Sub-watershed, the Sawmill Brook Sub-watershed, and the Roaring Brook Sub-watershed, as well as a small section of Amethyst Brook that drains south into the Fort River in Amherst. This small section of Amethyst Brook is located in the south-central section of town just north of the border with Pelham, and is tributary to a public water supply for the Town of Amherst, the Hawley Hill Intake (which is located in Pelham). The headwaters of Amethyst Brook contain both forested and non-forested wetlands. Surface water in the eastern half of town is part of the Chicopee River Watershed, drains to the southeast, and is composed of the Swift River Sub-watershed. Within these sub-watersheds, the Sawmill River, Roaring Brook, Dean Brook, Nurse Brook, Adams Brook, the West Branch of the Swift River, Atherton Brook, Camel Brook, Cobb Brook and Amethyst Brook have been designated by the Massachusetts Department of Fish and Game (DFG) as cold-water fisheries and are considered to be high-quality trout streams.

Connecticut River Watershed

Adams Brook Sub-watershed

The Adams Brook Sub-watershed is located south of Leverett Road and west of Pelham Hill Road and covers 3,721 acres or 21% of town. Adams Brook, Dean Brook and Nurse Brook are the three main tributaries. Many forested and non-forested wetlands are located at the headwaters to these brooks. Baker Brook is tributary to Dean Brook and feeds into Baker Reservoir, a 2.7-acre man-made pond that was created in the 1890s and is located on the southern side of Baker Road. It has an associated 22-acre wetland, consisting of both forested and non-forested areas (covering approximately 21 acres and 1.3 acres, respectively). Old records describe some unusual wetland plants inhabiting the southern shore, such as wild calla, closed gentian, swamp azalea, rhodora, round-leaved sundew, and black tupelo.

Nurse Brook feeds into Atkins Reservoir, a 48-acre water body that is located in the southeastern corner of Shutesbury along Cushman Road. The site of the former Atkins Pond, the reservoir was developed in the 1930s as a surface water drinking water supply for the Town of Amherst. The reservoir has a watershed of approximately 6 square miles, a surface area of 51 acres, a storage capacity of 200 million gallons, and an estimated safe yield of 1.2 million gallons. Since it is a public water supply, the reservoir is theoretically off-limits to recreational uses, although infrequent use by trespassers continues to be an issue. The reservoir provides a pristine and scenic vista from the January Hills area.

Dean Brook flows into Adams Brook southeast of Atkins Reservoir, but the Town of Amherst sometimes diverts water from Dean Brook into Atkins Reservoir. Dean Brook has one of the most scenic cascade and gorge landscapes in the area. In the spring, DFG stocks Adams Brook with brook trout and also with rainbow trout, when available. In the past, Dean Brook has contained a population of native brook trout.

Sawmill River Sub-watershed

The Sawmill River Sub-watershed occupies 2,655 acres or 15% of Shutesbury and is located in the northwestern corner of town, around Locks Pond Road, Lakeview Road and the northern ends of Wendell and Montague Roads.

Ames Pond

Ames Pond is a 22-acre man-made water body with a stone dam that was used to power a mill in the late nineteenth century. The pond is only 5 feet deep at its deepest point. There is a 35-acre wetland that extends northeast from the pond's eastern shore and contains 19.5 acres of forested wetland and 15.5 acres of non-forested wetland, including a spectacular 2-acre natural bog, located directly along the shoreline, that contains cotton grass, wild cranberry, swamp pink, leatherleaf, button bush and round-leaved sundew (a carnivorous plant). The pond also contains a beaver lodge and is used by a variety of wildlife. Water from an adjacent freshwater marsh drains into Ames Pond and the flow of water out of the marsh has been periodically restricted by beaver dams. In 2003, a CR was placed on 140 acres of land surrounding the pond. The restriction is held by DCR and prohibits development of the land, with the exception of a small acreage of upland, roadside frontage. A trail system that was constructed by the owner around the property may be used by the public for certain permitted uses that are posted. Ames Pond drains into South Brook which flows into Lake Wyola.

Lake Wyola

Tyler Brook flows into Tyler Pond and subsequently into Plympton Brook in Wendell. Plympton Brook flows into Fiske Brook (in Wendell) which, in turn, flows into Lake Wyola and contributes approximately 80% of the water entering the lake. Just upstream of the location where Fiske Brook enters Lake Wyola, emergent and scrub-shrub wetland vegetation is present. South Brook drains into the southern end of the lake after flowing through an 8.7-acre forested wetland in the interior and a 7-acre non-forested

wetland along the shoreline. The round-leaved sundew has been observed growing along the shoreline east of the boat launch, in the past. A 19-acre non-forested wetland, lies at the headwaters to South Brook, along with the adjacent 2-acre "Footit's Bog."

Lake Wyola is 129 acres in size and has a maximum depth of 33 feet. However, most of the lake is relatively shallow, with an average depth of only 11 feet. Lake Wyola was a mill pond in the eighteenth and nineteenth centuries that supplied a series of mills in Leverett via its outflow stream, the Sawmill River. The current dam was built in 1888 and its creation approximately doubled the surface area of the original pond. The dam has both a spillway and a manually-operated gate that allows the release of additional water during occasional drawdowns for dam maintenance and repair. In 1998, the Office of Dam Safety (part of what is now DCR) ordered a safety assessment of the dam to be performed and certain repairs to be undertaken to prevent downstream flooding and erosion in the event of a dam failure. The inspection was required to be done immediately and repairs were completed in 1998. Subsequently, another inspection was required in 2007 and a new plan for additional repairs was produced. The new repair work was done in fall 2008 and early winter 2009 during another drawdown.

A Great Pond is defined as any pond or lake that contained more than 10 acres in its natural state. With an original size of 65 acres before the dam was constructed, Lake Wyola qualifies as a Great Pond. Public access is required and this is provided at the southern end of the lake where a public boat ramp exists off Randall Road. The lake's Great Pond status also mandates that certain projects in and around the lake, such as aquatic weed control, beach sand replenishment, dredging, the placement of fill, the lowering of water levels, and the construction of docks, piers, moorings or rafts, are subject to not only the Massachusetts Wetlands Protection Act Regulations (WPA Regulations: 310 CMR 10.00), but also to the Waterways (Chapter 91) Regulations (310 CMR 9.00). In addition, the 401 Water Quality Certification Regulations (314 CMR 9.00) apply to projects involving dredging or filling. Under the WPA Regulations, projects in the lake area also undergo additional scrutiny by NHESP (a program of DFG's Division of Fisheries and Wildlife), due Lake Wyola's designation as an Estimated Habitat of Rare Wetlands Wildlife for a small fish named the bridle shiner.

More than three-quarters of the shoreline of the lake is developed with year-round homes and summer cottages that exist on very small lots that average 1/4 acre in size. Each lot has its own septic system, and most of these systems have been in use for many years and were designed before the more rigorous revisions to the State Environmental Code (Title 5) Regulations (310 CMR 15.00) went into effect in 1995. The placement of so many septic systems so close to one another and to the lake shore has the potential to cause significant nutrient loading and eutrophication in the lake, as well as increased bacterial counts. Fortunately, water testing results from Lake Wyola over the past 17 years indicate that Lake Wyola's water quality is good, with measurements showing only low levels of nitrogen, phosphorous and algae, in comparison to comparable water bodies statewide. Testing results also indicate that Lake Wyola is not becoming eutrophic, due to human causes, to any quantifiable extent, nor are beavers a

problem. However, as use of the lake increases seasonally with the summer influx of residents and recreational users (including the 30,067 visitors to Lake Wyola State Park during summer 2008 (Marble, 2009)), higher levels of nitrogen have been periodically reported. The sporadic beach closures that have occurred at Lake Wyola State Park have resulted not from bacteria loading related to septic systems around the lake, but from flocks of geese spending the night at the park's beach and, less frequently, due to a large number of bathers using the park's swimming area. In addition, potential increases in the sizes of dwellings around the lake and associated increases in the number of occupants could result in septic tank overloads.

Both invasive vegetation and algae thrive in the acidic conditions, such as those present in the lake, that derive from surrounding acidic soils, and this could be a potential major problem. In the past, the growth of algae and other aquatic vegetation in the lake was monitored by scuba divers who collected samples and conducted underwater video mapping and by visual observations during drawdowns and walks around the lake. More recently, federal grant money was used to fund an aquatic vegetation study by Geosyntec Consultants, Inc. In addition, volunteers from the Lake Wyola Association, who were trained by DCR staff, have been participating in a Weed Watchers Program to keep an eye on invasive weed growth in the lake. To date, Lake Wyola is currently devoid of invasive submergent aquatic vegetation, such as Eurasian milfoil, Brazilian waterweed, hydrilla, parrot feather, curly pondweed, and water chestnut, although Eurasian milfoil is present in the "Tri-lakes" region of Belchertown and in Leverett Pond.

In 1998, Lake Wyola had been placed on the 303(d) list of impaired waters by the Massachusetts Department of Environmental Protection (MassDEP), due to elevated levels of phosphorous and noxious weeds. However low total phosphorous levels in a 2001 study funded by the Massachusetts Water Quality Initiative confirmed that phosphorous levels were low enough to remove the Lake from the 303(d) listing in 2002. The development pressure in the watershed surrounding the lake is the most acute threat to Lake Wyola's water quality, and the Lake Management Committee of the Commonwealth's Water Resources Commission has recommended addressing impacts that might occur within the watershed upstream of the lake. In 2003, a 319 Non-point Source Pollution Grant was awarded by the U.S. Environmental Protection Agency jointly to DCR, the Town of Shutesbury, the Lake Wyola Advisory Committee, and the Lake Wyola State Park/Ruggles Pond Advisory Board to protect Lake Wyola and its watershed. It focused on enhancing erosion controls and drainage improvements around the lake, managing septic systems, and educating the public about environmental concerns associated with the lake environment. Related future tasks would include a detailed survey on non-point source pollution in the watershed.

In addition, since 1997, the town has been implementing some recommendations that were provided in a plan entitled *A Management Plan for Lake Wyola* (prepared by New England Environmental, Inc.). Recommendations in this plan included a scheduled lake drawdown every 7 years for aquatic nuisance vegetation control (i.e., non-invasive species); the repair of shoreline structures; the reduction of sedimentation and control of drainage, erosion and runoff through the proper maintenance of paved and unpaved

roads (such as Randall Road, Lake Drive and North Laurel Drive) and provision of drainage enhancements. Some of this recommended work continues to be performed, such as drainage work on Wendell Road. However, the Conservation Commission has only been in favor of conducting lake drawdowns for dam repairs.

Uncontrolled runoff from 97 acres of sub-watershed on the eastern and northeastern slopes of Morse Hill is currently contributing to erosion problems along Locks Pond Road and within Lake Wyola Association properties and roadways located along the western side of the lake. This drainage threatens to compromise septic system soil absorption fields in locations that are already taxed by high-groundwater conditions and small lot sizes, and may cause sediment deposition and re-suspension in Lake Wyola at areas adjacent to storm drainage outfalls. In January 2007, Scott Campbell, an engineer with DCR, evaluated stormwater issues on the western side of the lake and created a draft report listing some suggested improvements and mitigating measures. The report, titled *Locks Pond Road and Lake Wyola Subwatershed Stormwater Improvement Study, Shutesbury, Massachusetts*, recommended the use of water bars, asphalt berms, bioretention areas, extended detention ponds, rain gardens, leaching basins, and rain barrels (to control roof runoff). The report also recommended changing road cross-sections to increase crowns, stabilizing roadside ditches with turf-reinforced, mat-linings, and increasing channel cross-section widths to allow conveyance of greater flows. All proposed measures would be designed to divert, store and infiltrate stormwater runoff and remove excessive sediment loads. However, many of these measures require regular maintenance to remain effective, some require acquisition of easements on undeveloped private land in order to construct some of the stormwater management structures, and all would require homeowner understanding of the proper functioning of the structures, as well as the funding to construct and properly maintain all of the drainage improvements. All of these constraints make implementation of these measures very difficult, if not infeasible.

In addition, the placement of a CR on a 220-acre parcel of land east of Lake Wyola that contains Tyler Brook and Ames Hill, and a CR on land around Ames Pond, are important steps in protecting the watershed by restricting development in these important watershed areas. Lake Wyola's healthy water quality is an important factor in the value of the many homes that surround the lake, because of their dependency on shallow wells for drinking water, and the attractive setting of their waterfront properties.

The lake is used intensively for fishing, swimming, boating and water skiing in the summer and for ice fishing and snowmobiling in the winter. DCR manages the 40-acre Lake Wyola State Park Carroll A. Holmes Recreation Area that is located on the northern shore of the lake. The park has a beach, trails, and picnic areas. At the southern end of the lake, near the boat ramp, both non-forested and forested wetlands exist on town conservation land that has trails connecting to the South Brook Conservation Area.

The lake is considered a warm-water fishery, although trout – a cold-water fish, can survive in approximately 10% of the lake. Chain pickerel, brown trout, rainbow trout, yellow perch, sunfish (including pumpkinseed, blue gill and black crappie), brown bullhead,

golden shiner, bridle shiner, banded killifish, fallfish and white sucker are found in the lake. These species include both native and non-native species. The peak fishing season is from April through June, however, ice fishing for chain pickerel and trout is also popular. DFG stocks the lake with brook trout and rainbow trout in the spring and rainbow trout in the fall.

The water quality of the lake is also crucial for the Sawmill River which flows out of the lake. The Sawmill River contains a population of native brook trout. The Sawmill River also contains juvenile Atlantic salmon as a result of the Connecticut River Salmon Restoration Program, with salmon fry being stocked each spring by DFG downstream of Shutesbury in the Leverett portion of the river (Caleb Slater, 2008).

Dudleyville Marsh

The former Dudleyville Ponds off the eastern and western sides of Montague Road were drained several years ago (by order of DCR's Office of Dam Safety) and have become the only large expanses of herbaceous wetland in town, outside of some areas of the DCR's Quabbin property. The former ponds now consist of 9.25 acres of shallow and deep marsh, with a natural spring and sphagnum bog on the western side and 6 acres of forested wetland along the southern end of the marsh. Part of the wetland and bog on the western edge are protected as town conservation land. The private owner of the dam has plans to make the necessary safety improvements to the dam so that the ponds can be restored. This may take several years. In the meantime, young white pine and some phragmites (an invasive species) are growing in along the shoreline, but the bog seems to be stable.

Roaring Brook Sub-watershed

The Roaring Brook Sub-watershed covers 2,914 acres or 17% of town. Most of its tributaries are located north of Leverett Road and the main stem runs parallel to Leverett Road where its steep gradient and forested banks provide one of the most scenic landscapes in town: the "S-curves." Both forested and non-forested wetlands and several small ponds are located within this watershed. Roaring Brook is stocked by DFG in the spring with brook trout and with rainbow trout, when available. In the past, Roaring Brook has contained a population of native brook trout. Concerns about this area include the impacts of road drainage, road maintenance, and driveway crossings, and the potential decline of the hemlocks due to the presence of the hemlock wooly adelgid.

Chicopee River Watershed

Quabbin Reservoir is located on the eastern edge of Shutesbury. The reservoir occupies a total of 24,700 acres, however, only 138 of its acres and 2.7 miles of its shoreline are located within Shutesbury. The portion of the Quabbin Reservoir Watershed that is located in Shutesbury occupies 7,862 acres or approximately 45% of town. The DCR's Division of Water Supply Protection owns 5,098 of these acres, 4,147 of which are Off-Reservation Lands (i.e., those west and north of Route 202), with the remainder being

the more-highly-restricted Quabbin Reservation Lands. The Massachusetts Watershed Protection Act Regulations (350 CMR 11.00) control recreational uses on both Reservation and Off-Reservation Lands. Canoeing, kayaking, boating, swimming, ice fishing, and ice skating are prohibited activities in Quabbin Reservoir, however, fishing for lake trout, brown trout, rainbow trout, brook trout, landlocked salmon, chain pickerel, large-mouth bass and smallmouth bass is allowed. Fishing within the Quabbin Reservoir and West Branch of the Swift River on the Reservation Lands is restricted to the period from mid-April through mid-October, whereas year-round fishing is allowed in the streams on Off-Reservation Lands.

Rocky Run and Camel Brook drain into the West Branch of the Swift River in the north-central and east-central sections of town, respectively. Both brooks contain forested wetlands at their headwaters. A small pond is located at Rocky Run's headwaters. The West Branch of the Swift River contains both forested and non-forested wetlands at several locations throughout its length within Shutesbury. In the past, Rocky Run has contained a population of native brook trout.

Cobb Brook and Atherton Brook (and its tributaries Town Farm Brook and Osgood Brook), and Briggs Brook drain land in the extreme southeastern corner of town and empty into the Quabbin Reservoir. In the past, Atherton Brook has contained a population of native brook trout. Forested wetlands exist along Town Farm Brook and Osgood Brook. Osgood Brook and Briggs Brook have small ponds located at their headwaters. In addition, Osgood Brook drains a non-forested wetland.

The West Branch of the Swift River contains numerous forested wetlands and some non-forested wetlands. It also contains both a native brook trout population and a group of sensitive invertebrates that are indicative of high water quality and the absence of pollutants. The river is annually stocked with brook trout. The West Branch of the Swift River empties into Quabbin Reservoir, which contains a population of land-locked salmon that is supplemented with the stocking of 10,000 salmon smolts each spring. Because the salmon freely migrate upstream from the reservoir, the West Branch of the Swift River is, not unexpectedly, a popular fly-fishing area in the fall. Rainbow and brown trout are also known to ascend the West Branch to spawn in the spring and fall, respectively.

Protected Surface Waters, Watershed Areas and Wetlands

There are a number of state laws and regulations that protect surface water, watershed areas and wetlands in Massachusetts. These are the Massachusetts Surface Water Quality Standards (314 CMR 4.00), the 401 Water Quality Certification Regulations (314 CMR 9.00), the Massachusetts Drinking Water Regulations (310 CMR 22.00), the Watershed Protection Act Regulations (350 CMR 11.00), the Massachusetts Water Resources Management Program Regulations (310 CMR 36.00), and the Wetlands Protection Act Regulations (310 CMR 10.00). Since most of Shutesbury's streams are not considered navigable, the Waterways Regulations mainly apply to regulated activities within Lake Wyola, as already described. All perennial streams receive pro-

tection under the Rivers Protection Act of 1996, which requires a 200-foot Riverfront Area protective buffer.

Under the Massachusetts Surface Water Quality Standards, Class A Waters include sources of public water supplies and their tributaries; waters designated as excellent habitat for fish and other aquatic life for their reproduction, migration, growth, and other critical functions; and waters used for primary and secondary recreation (if allowed). Class A Waters are protected as Outstanding Resource Waters. Regulated Outstanding Resource Waters cover a considerable percentage of the town's land area (more than half the land area in a north-south direction), since the Quabbin Reservoir and its tributaries, the Town of Amherst's Atkins Reservoir and its tributaries and Amethyst Brook are all classified as Outstanding Resource Waters. A 401 Water Quality Certification must be obtained for any discharge of dredged or fill material to a water of the Commonwealth and these regulations set strict limits on alterations to Outstanding Resource Waters. Limits are placed on discharges to these waters that affect dissolved oxygen, temperature, pH, bacteria, solids, color and turbidity, oil and grease and taste and odor. Additional limitations are also placed on discharges to these waters that may affect aesthetics, or concentrations of bottom pollutants, or alterations that affect the bottom, nutrients or radioactivity, or contribute toxic pollutants. Generally, discharges of fill or dredged materials to Outstanding Resource Areas are prohibited; no discharge of dredged or fill material is allowed in wetlands or waters of the Commonwealth within 400 feet of the high water mark of a Class A surface water (exclusive of its tributaries). However, some discharges are allowed under certain conditions when done by a public water system, by a public agency or authority for roadway maintenance or if the project has obtained a variance.

The Massachusetts Drinking Water Regulations regulate three surface water protection areas: Zones A, B and C (Map 6). The Zone A to a surface water contains land between the surface water source and the upper boundary of the bank, land within 400 feet of the bank of a Class A (public drinking water supply) surface water source and land within 200 feet of the bank of a tributary or surface water body that lies upstream of a Class A surface water source. Zone B is land within 0.5 miles of the bank of a surface water source or the edge of the watershed, whichever is less, but always includes land within 400 feet of the bank of a Class A surface water source. Zone Cs are all land between the Zone B boundaries and the watershed boundaries in Shutesbury. Amethyst Brook and all tributaries to Quabbin and Atkins Reservoirs (all classified as Class A surface water sources) have associated Zone As, Bs, and Cs. However, the regulation of activities along certain tributaries in the Quabbin Reservoir watershed comes under the jurisdiction of the Watershed Protection Act (to be discussed in the following paragraph). The only sub-watershed in Shutesbury that is not covered is the Sawmill River Sub-watershed, with tributaries coming from Ames Pond, South Brook, Tyler Brook, Fiske Brook, Plympton Brook (both in Wendell) and the Dudleyville Marsh. In Zone As, where a water supplier is proposing to develop a new or expanded public surface water supply, the following new or expanded uses are prohibited: underground storage tanks; above-ground storage of liquid hazardous wastes (with some exceptions for fuel tanks for household use or tanks within containment structures, etc.); and cer-

tain wastewater treatment or disposal facilities. In addition, water suppliers are expected to show that they have made best efforts to put into place zoning and non-zoning controls to prohibit the siting of the following new land uses within a Zone A: facilities that generate, treat, store or dispose of hazardous wastes; sand and gravel mining operations; the uncovered or uncontained storage of fertilizers, manure or de-icing materials; junk and salvage operations; motor vehicle repairing operations; cemeteries; solid waste combustion or handling facilities; commercial car washes; and land uses that render impervious more than 15% or 20% (with artificial recharge), or 2,500 square feet of any lot, whichever is greater. Additional restrictions apply to septic or sewer systems; the stabling, feeding or grazing of livestock; and burials in existing cemeteries within Zones A and B. Furthermore, swimming, bathing, wading, fishing, boating, ice-fishing and domestic animals are prohibited within any surface water source or tributary thereto. Public water suppliers are required to periodically inspect Zones A, B, and C to ensure compliance with the regulations and thereby protect surface water supplies. Since the Town of Amherst owns most of the watershed land associated with its various water supplies, ensuring compliance with the Drinking Water Regulations in most locations is easier than if these lands were in private ownership.

As stated previously, DCR owns most of the Quabbin Reservoir watershed lands that are located in Shutesbury, either as Reservation and Off-Reservation Lands or the Shutesbury State Forest, with the remainder being in private ownership. The Massachusetts Watershed Protection Act Regulations regulate land uses and activities on privately-owned lands adjacent to certain mapped tributaries and surface waters and their associated bordering vegetated wetlands (BVWs) and floodplains within the Quabbin Reservoir watershed for the purpose of protecting the quality of the drinking water supply. A substantial portion of the lands on Shutesbury's eastern slope are regulated by the Watershed Protection Act Regulations. These regulations address land uses in two critical areas. First, within 400 feet of water supply reservoirs and within 200 feet of tributary streams and surface water bodies, all alterations are prohibited. These include: changing runoff characteristics; intercepting or diverting groundwater or surface water, constructing or reconstructing utilities; constructing, reconstructing or paving of roadways or other ways; driving pilings; installing or substantially expanding drainage systems; erecting, reconstructing or substantially expanding structures; draining, dumping, dredging, damming, discharging, excavating, filling or grading; and the generation, storage, discharge and disposal of pollutants. However, exemptions (with certain conditions) exist for lawful uses, structures and facilities in existence on or before July 1, 1992. These include: the construction of a single-family dwelling on an existing vacant lot; minor changes to an existing structure; the division of an owner-occupied existing parcel to create one additional building lot; the conversion of land to agricultural use under a plan approved by NRCS; the maintenance or improvement of land in agricultural use; the maintenance of existing public roadways; the construction of certain public highways or railroad tracks; the maintenance of public utilities; the cleanup or prevention of releases of hazardous materials or waste; and the construction of municipal sewage treatment systems or water systems (if there is no impact to water quality and these systems meet the appropriate regulations).

Second, within locations between 200 and 400 feet from tributary streams and surface water bodies, the 100-year floodplain of a tributary or surface water, and BVWs that border on tributaries, surface waters or the Quabbin Reservoir, specific activities are prohibited and all development proposals are evaluated by DCR's Division of Water Supply Protection. Many of the prohibited activities are similar to those listed under MassDEP's Drinking Water Quality Regulations, although DCR's regulations contain additional prohibitions. Prohibited activities include: the treatment, disposal, use, generation or storage of hazardous materials or wastes; the storage and disposal of solid waste; the storage of liquid petroleum products, except for residential uses with containment; the construction of a subsurface waste disposal system less than 4 feet above the maximum high groundwater table; the disposal of pollutants from sewage treatment facilities; the outdoor storage of de-icing chemicals, fertilizers, herbicides and pesticides; the use of certain pesticides or herbicides with high mobility ratings or which pose a threat to groundwater; the outdoor, uncovered storage of manure; the commercial servicing, repairing or washing of boats or motor vehicles; the operation of junk and salvage yards; the rendering impervious of more than 10% of any lot or 2,500 sq. ft., whichever is greater; the excavation of sand and gravel to a depth less than 6 feet above the high water table; the construction of a dwelling that exceeds 2 bedrooms per acre or which may generate more than 220 gallons of sanitary sewage per acre per day; and any alteration of a BVW. All project proposals must analyze the impacts of the project to surface water quality by comparing these to the Surface Water Quality Standards for Class A Surface Waters and Outstanding Resource Waters. DCR's Environmental Planning Section reviews permit applications; conducts site visits; issues advisory rulings, determinations of applicability and variances; and takes appropriate actions to bring violators into compliance.

As previously stated, Shutesbury has a large number of smaller wetland areas located at the headwaters and along numerous tributaries that run through town (see Map 5). The more significant smaller wetland areas are briefly described in the sections of this plan that focus on watersheds, and some of the more significant, unique or larger wetland areas are described in other sections of this plan. However, it is not within the purpose or scope of this plan to focus on every small wetland within the town's borders, especially since these small areas already receive significant protection under the state and federal laws and regulations and under the watchful eye of the Shutesbury Conservation Commission. Wetlands areas, including BVWs, Land under Water, riverbanks, and the 100-year floodplain receive regulatory protection under the WPA Regulations and the following maximum alteration thresholds are established: 5,000 square feet of BVW, Land Under Water or Land Subject to Flooding, and 50 linear feet of bank. All proposed alterations are required to be minimized or mitigated. The WPA Regulations were designed to protect public and private drinking water and groundwater supplies, to protect wildlife habitat and fisheries, to control flooding, and to prevent storm damage and pollution. In addition, projects that will take place within the 100-foot Buffer Zone around banks or BVWs are subject to regulatory review. Furthermore, the 200-foot riverine corridor on both sides of a perennial stream or river (measured from the mean annual high water mark) is afforded additional protection under the Rivers Protection Act (Ch. 258 of the Acts of 1996) to protect the natural integrity of rivers and

to encourage and establish open space along rivers. This law builds on the strength of the existing permitting procedures under the WPA to protect water quality, stabilize stream banks, reduce peak floods and downstream flooding, maintain habitat and protect groundwater. Approximately 1,751 acres in Shutesbury lie within the Riverfront Area. Proposed projects in the Riverfront Area must have no significant impacts and demonstrate that no practical alternatives exist. Existing structures, such as single-family homes, roads, driveways, and utilities, are exempt from the Rivers Protection Act. The Shutesbury Conservation Commission issues permits for proposed work in wetlands and riverfront areas, with MassDEP serving as an appeal agency that may either overturn or support decisions that have been made at the local level.

The Massachusetts Water Management Act (MGL Ch. 216) and the Water Resources Management Program Regulations were established in 1986 to evaluate and control cumulative impacts to hydrologically-connected water sources, both surface water and groundwater. These regulations were promulgated to protect existing water uses, including hydropower resources, navigation, aquaculture, and water-based recreation; wildlife habitat and fisheries; wetlands; and land values, investments and enterprises that are dependent on previously-allowed water withdrawals. Potential users proposing new water withdrawals of 100,000 gallons or more per day must apply for a permit from MassDEP and users with existing above-threshold withdrawals were all required to register with MassDEP when the regulations first went into effect.

The Town of Shutesbury also has a local wetlands bylaw and regulations, administered by the Conservation Commission, that provide greater protection of some resource areas than the state Wetlands Protection Act.

Living Waters Core Habitats and Supporting Critical Watersheds

In 2003 NHESP identified and delineated, rivers, streams, lakes and ponds that are considered to constitute exemplary aquatic habitats that are important to the freshwater biodiversity of the Commonwealth. These areas are mapped as Living Waters Core Habitats. Living Waters Core Habitats focus on protecting riparian areas in 330-foot wide zones around water bodies to maintain cooler water temperatures and the flow of nutrients and water needed by fresh water species. Four Living Waters Core Habitats have been identified in Shutesbury: LW098, LW309, LW410, and LW411.

Core Habitat LW098 consists of Lake Wyola. This area is protected because of the presence of the bridle shiner, a Special Concern fish species that has persisted in the lake since 1964. This minnow serves as an important prey species for larger fish in the lake. Core Habitat LW309 consists of Quabbin Reservoir and is identified both as an Exemplary Lake/Pond Habitat and as habitat for the bridle shiner. Core Habitats LW410 and LW411 are mapped along a 0.25-mile segment of the West Branch of the Swift River (located approximately 1.25 miles upstream of the point where the river enters Quabbin Reservoir) and along a 0.25-mile segment of Sibley Swamp Brook (located approximately 0.5 miles upstream of it confluence with the West Branch of the Swift River), respectively, and have been identified as important habitats for

ecologically-sensitive aquatic insects such as mayflies, stoneflies and caddisflies. The presence of these sensitive insect communities indicates that the current habitat is free of pollutants and other impacts of development.

In addition, each Living Waters Core Habitat is associated with mapped Critical Supporting Watersheds that constitute the immediate, upgradient portions of the watersheds that sustain or potentially could degrade the Core Habitat. These are considered to be areas where conservation efforts should be targeted. The Living Waters Core Habitats have been incorporated into the BioMap2, to be discussed later in this section. However, NHESP has not included entire Living Waters Critical Supporting Watersheds in its BioMap2.

Vernal Pools

There are 14 vernal pools that have been certified by NHESP throughout town; an additional 32 potential vernal pools have been identified by NHESP (Map F2). These temporary pools provide essential, predator-free breeding habitat in the spring for several amphibian species, including several state-listed species. Certified Vernal Pools are afforded special protection under the WPA Regulations, and the under the Forestry Cutting Practices Act (MGL Ch. 132 s. 40-46) and the Forestry Cutting Practices Act Regulations (304 CMR 11.00). Under the WPA Regulations, the vernal pools and a 100-foot zone around them are subject to regulatory review. Any project proposed within a vernal pool or within 100 feet of a vernal pool cannot result in an impairment of its capacity to provide wildlife habitat functions such as food, shelter, migratory and breeding areas, and overwintering areas for amphibians; and food for other wildlife. Since the topography, soil structure, plant community composition and structure, and hydrologic regime of vernal pool habitat are considered to provide these wildlife habitat functions, no alterations of these areas that will affect these characteristics are allowed.

DCR administers the Forestry Cutting Practice Act Regulations. Under these regulations, persons harvesting lumber are required to employ certain practices around vernal pools to minimize impacts and preserve the characteristics of the physical environment that these species require. Tree tops and slash must be kept out of vernal pools, unless these materials fall during the breeding season, when they should be left in place to provide possible egg mass attachment sites. No heavy equipment should operate within the vernal pool, even during the dry periods of the year, and machinery should be operated more than 50 feet away from vernal pools during mud season, and 40 feet during the dry season. Landings, skid roads, haul roads and log-stacking areas should be located outside of vernal pools, and measures should be taken to ensure that the pools do not fill with the sediment eroding from nearby areas of disturbed soil. The vernal pools and an area within 50 feet of these pools should be maintained in a shaded and mostly undisturbed condition by avoiding clear-cutting and maintaining some forest cover and understory vegetation.

Groundwater

Shutesbury's current water supply is restricted to groundwater, therefore, groundwater is a very important resource in town. Most of Shutesbury is serviced by private wells, with the only public water supply wells servicing the Shutesbury Elementary School, Lake Wyola State Park, the Pine Brook Camp and Conference Center, the Shutesbury Athletic Club and the Sirius Community. These five water supplies are regulated by MassDEP as public water systems because they serve water for human consumption to an average of at least 25 individuals daily, for at least 60 days of the year.

Limited research has been done on aquifers in Shutesbury, so knowledge is restricted to several USGS hydrogeologic studies that were performed in the 1970s and 1980s and the preliminary surficial geology study that was done in 1978. The hydrogeologic studies are: *Groundwater Availability in the Northern Part of the Connecticut Valley Urban Area, Central New England* (Miscellaneous Investigation Series I-1074-I, by Michael H. Frimpter, 1980), *Map Showing Availability of Ground Water in the Connecticut River Lowlands, Massachusetts* (Hydrogeologic Investigations Atlas HA-563, by Eugene H. Walker and William W. Caswell,1977) and *Water Resources of the Chicopee River Basin, Massachusetts* (Hydrogeologic Investigation Atlas HA-693, by Bruce E. Krejmas and Anthony Maevsky, 1986). Although general in their scope and level of detail, these resources may be used to get a rough idea of the types of aquifers that are present in town and the maximum yields that realistically could be obtained from these aquifers under optimum conditions. In addition, files at MassDEP, on the six public water supply wells that are located in town, provide supplemental information concerning the bedrock aquifer. Town Board of Health records on private wells and records contained in MassDEP's SearchWell database may provide additional, but limited, information on well depths, formation yields, etc. During the past several years, the town's Water Resources Committee (WRC) has been meeting to assemble the limited information that is currently available on groundwater sources in town. In late 2014, the WRC installed four paired monitoring wells throughout town, in order to evaluate the health and long-term sustainability of the bedrock aquifer. At each location, a deep well (at least 100 feet) was drilled into the bedrock, and a companion shallow well (drilled through the soil layers to the top of the bedrock) was installed close by. Automatic data loggers installed in each well will measure and store water level data at pre-set intervals. This will allow the WRC to track both seasonal and long-term water level changes in both the bedrock and surficial geologic layers. Periodically, samples will also be collected and analyzed to provide snapshots of selected water quality parameters.

As previously stated in the *Geology* Section and shown on Map 4B, stratified drift is relatively rare in Shutesbury. Stratified drift deposits in town are estimated to range in thickness from 0 to 50 feet. Where the deposits are thickest, coarse-grained, and lie near large streams, these shallow aquifers will give the highest yields of groundwater. Although not studied within Shutesbury, similar deposits within the basins of the Millers, Deerfield, and Chicopee Rivers have shown yields as high as 100 gallons per minute (gpm) and, in some cases, 200 gpm, although such wells more typically yield only 25 gpm. USGS classifies wells yielding between 100 and 300 gpm as medium-yield wells

and wells yielding under 50 gpm as low-yield wells. Most low-yield wells would have adequate yields for domestic supplies, but for such wells to be capable of sustaining municipal or industrial demands, the aquifer would have to be dependent on recharge from adjacent streams and lakes. These stratified drift deposits are located in the areas north, east and southeast of Lake Wyola (including a zone surrounding Ames Pond); in a zone surrounding the Dudleyville Marsh; along the central and southern portions of the West Branch of the Swift River; around portions of Quabbin Reservoir; along Roaring Brook; along Dean Brook; around Baker Reservoir; in the area north of Atkins Reservoir and along Adams Brook south of Atkins Reservoir.

Till forms a widespread, but discontinuous blanket over bedrock in the uplands and lies below stratified drift in the lowlands and valleys. In favorable locations, large-diameter (i.e., 36-inch) wells in till can yield as much as 10 gallons per minute. Such large-diameter wells were used in the past, but have been phased out in most areas in favor of bedrock wells, since most of these wells did not yield enough water to supply modern homes.

Because of the limited distribution of the stratified drift deposits, most wells in Shutesbury probably tap the bedrock aquifer. However, since no detailed hydrogeologic studies have been completed, to date, little information is available on the structure of the aquifer, potential yields or well construction requirements, other than from well driller's records for private wells or other data on file for some of the town's public water supply wells. Information for over 500 private wells contained in MassDEP's Well Drillers Certification Program SearchWell Database indicates that most private wells in town range in depth between 150 and 400 feet, although there are a few that are very shallow (ranging from 14 to 80 feet deep) and several that are very deep (ranging in depth from 500 to 750 feet). The average depth of a private well in town is 290 feet. By virtue of the proximity of the water supply to the ground surface, the shallow wells are more susceptible to contamination from bacterial and chemical sources that may exist near the wellheads. Bedrock is exposed at the surface in many locations, especially in the higher-elevation areas in the eastern half of town, but it is generally covered by from 1 to 100 feet of surficial deposits. The permeability in bedrock at a well location is controlled by the number, size, orientation, and interconnectivity of the fractures, and may vary greatly from one location to the next, even over short distances. Fracture studies of the bedrock aquifer would yield important information concerning these characteristics. Relative to sedimentary rocks, the permeability of crystalline rocks (such as those underlying Shutesbury) is low and decreases with depth. Most water-saturated fractures in these types of rocks are located within 500 feet of the ground surface. Crystalline bedrock wells in the Chicopee River Basin evaluated in the USGS hydrogeologic study had an average yield of 6 gpm. Most homes, businesses, schools, etc., requiring small amounts of water use bedrock wells. These wells have higher yields in areas near streams or where the bedrock aquifer is under a cover of water-saturated, unconsolidated materials. Records in MassDEP's SearchWell Database indicate that during pumping tests, yields from Shutesbury's private wells ranged from 0.25 to 300 gpm, averaging 13 gpm. However, 61% of the private bedrock wells in town yield less than 10 gpm. Yields at the public water supply wells in bedrock in Shutesbury

are actually much lower and range from 0.70 to 5.25 gpm. Wells pumping less than 0.5 gpm are considered by MassDEP to be marginally dependable sources of water for domestic use.

Public water supply wells are located at the Shutesbury Elementary School, the Sirius Community, the Shutesbury Athletic Club, Lake Wyola State Park, and at the Pine Brook Camp and Conference Center (as depicted on Map 6). As opposed to all of the other public water supplies in town, Shutesbury Elementary School has two public water supply wells. However, one of them (Well 01G) is designated only for approved emergency use. These wells range in depth from 140 to 440 feet, although depths are known for only three of the wells. These wells serve between 25 and 500 people daily during the peak season of usage. Over the last decade, the average withdrawal volumes from each of these sources was: 370 gallons per day (gpd)/0.27 gpm for the Sirius Community, 114 gpd/0.08 gpm for Lake Wyola State Park, 211 gpd/0.15 gpm for the Shutesbury Athletic Club, 1,342 gpd/0.93 gpm for Pine Brook Camp and Conference Center, and 616 gpd/0.43 gpm for the Shutesbury Elementary School.

Routine water samples collected over a number of years from these public water supply wells (from 7 to 14 or more years depending upon the date of system registration) indicated that there have been no exceedances of drinking water standards for fecal coliform or any other of the sampling parameters, such as nitrate, nitrite and sodium (MassDEP Drinking Water files). Manganese has been recently added to list of water quality parameters required to be tested, and those concentrations have been below health advisory levels, as well. The Shutesbury Elementary School is subject to additional sampling requirements, because it serves water to at least 25 of the same persons, at least 4 hours per day, at least 4 days per week for at least 6 months of the year. Water at the Shutesbury Elementary School has also been tested for lead and copper, volatile organic compounds and perchlorate, and all samples have tested below drinking water standards. Although not an absolute indicator of the water quality in any particular private well (because water quality in private wells may be influenced by local conditions that are owner-influenced or otherwise), these results suggest that groundwater is generally of good quality in the areas of Shutesbury where these public water supply wells are located, at the present time.

Under the Massachusetts Drinking Water Regulations, a Zone I protective radius must be established around each public water supply well that is either owned or controlled by the supplier of water, so that current and future uses within this zone are limited to those directly related to the provision of drinking water that have no significant adverse impact on water quality. Because they all pump less than 100,000 gallons per day (70 gpm), all Zone I wellhead protection areas for the public water supply wells in Shutesbury have radii ranging from 100.5 to 231.7 feet.

For public water supply wells pumping more than 100,000 gallons per day, Zone IIs must be determined. A Zone II is defined as the area of the aquifer that contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (i.e., 180 days of pumping at an approved yield with no recharge from

precipitation). The Drinking Water Regulations specify a number of prohibited and restricted land uses for Zone IIs that are similar to the prohibited and restricted land uses for surface water supplies (described above). If the water supplier owns the Zone II land, these prohibitions and restrictions can be readily enforced. Otherwise, the water supplier is expected to make best efforts to obtain zoning and non-zoning controls in the muncipality(ies) in which the Zone II lies. Since all of the current public drinking water supply wells in Shutesbury pump less than 100,000 gallons per day, the water supplier must only demonstrate that it has complied with the Drinking Water Program's *Guidelines and Policies for Public Water Systems* and that the source of the water supply will achieve all applicable water quality standards set forth in the Drinking Water Regulations. In addition, Interim Wellhead Protection Areas (IWPAs) are required for public water supplies that have not delineated their Zone II recharge areas, and in Shutesbury, the radii of these IWPAs range in size from 422 feet to 568 feet and cover surface areas ranging from 12.8 to 23.3 acres. However, MassDEP may require that a water supplier proposing to construct, expand or replace a public water supply (pumping less than 100,000 gallons per day) delineate a Zone II and submit a groundwater monitoring well program plan for approval if MassDEP finds that the existing or proposed land uses (such as landfills or hazardous waste sites) within the IWPA may pose a threat to water quality. Should wells pumping more than 100,000 gallons per day be proposed for construction in the future, more rigorous requirements will apply and MassDEP can deny approval of new wells in developed source areas. Such large-scale water users would also be required to obtain a permit from MassDEP under the Water Resources Management Program Regulations.

Pump tests, preferably ones extended in duration, are needed to evaluate sustainable yields, particularly of the bedrock aquifer, although it is unlikely that bedrock wells in a number of locations could ever serve as community water supplies, due to their relatively low yields. Because of their higher permeability and potential yields, the stratified drift deposits would be better candidates for siting community water supply wells, although their limited horizontal and vertical extents and the limited sizes of their recharge areas make this possibility unlikely, as well, particularly since the more horizontally-extensive deposits are located in the most developed section of town (i.e., around Lake Wyola). Although the town may wish to focus some of its future land acquisition efforts on some of the areas containing stratified drift deposits, detailed evaluations of the saturated thickness of the deposits and sizes of the recharge areas at potential well locations within the stratified drift aquifer should be made first to determine if these areas are likely to be able to serve as potential future community water supplies. If not, and unless these areas have additional values to offer, such as protecting unique or endangered species habitats, protecting surface water supplies, maintaining wildlife corridors, etc., then it may be more valuable to concentrate future land protection efforts on other areas of town that provide more benefits.

Flood Hazard Areas

Flood zones are geographic areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. These zones are depicted

on Flood Insurance Rate Maps (FIRMs), with each zone representing a different level of severity of flooding in the area. Although a number of counties in Massachusetts have updated floodplain mapping data available, Shutesbury's FIRM dates back to June 18, 1980. Therefore, it only contains the following older, more limited designations for flood hazard areas: Zone A (100-year floodplain), Zone B (500-year floodplain), and Zone C (areas of minimal flooding above the 500-year flood level). The December 1979 *Flood Insurance Study* for Shutesbury by FEMA differentiates Zone A from Zone A1, with Zone A having been determined by approximate methods and Zone A1 having been determined by detailed hydrologic methods and specifying base flood elevations and flood hazard factors. Current FEMA language further defines Zone A as areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Lake Wyola is the only area in town that is mapped as Zone A1, having a base flood elevation of 836 NGVD 29 and a flood hazard factor of 005. FEMA further defines Zone B as areas between Zone A and the limits of the 500-year flood, including areas that are protected from the 100-year flood by flood control structures; or shallow-flooding areas with depths less than 1 foot or drainage areas less than 1 square mile. Any areas having 100-year floodplains less than 200 feet wide were not considered by FEMA to be flood hazard areas and have not been mapped on the FIRMs. In addition, the southeastern quarter of town near Quabbin contains Zone C flood hazard areas defined as "minimal flood hazard – above the 500 year flood." However, FEMA chose not to represent these areas on a map in the FIRM. The relatively limited distribution of flood hazard areas in Shutesbury is not surprising. Because most of Shutesbury's streams and rivers flow through hilly terrain, floodwaters would be expected to be contained within the steep-sided walls of the stream valleys. Furthermore, the steep nature of the terrain abutting most of these streams makes these areas unsuitable for residential development.

Shutesbury's Zone A flood hazard areas are found around Lake Wyola, the portion of the West Branch of the Swift River from its intersection with Mt. Mineral Road and extending upstream to the border with Wendell, around Atkins Reservoir and in the Dudleyville Ponds area. Since the water has been drained from the Dudleyville Ponds area, the Zone A designation does not currently apply there. Zone B areas are located along South Brook, Tyler Brook, around Ames Pond, in an area northeast of the Dudleyville Ponds area, in the area around Baker Reservoir and along Dean Brook east of West Pelham Road, along the southern section of Nurse Brook after it crosses under Cushman Road, and in an area west of Plaza Road. It is important to note that, with the exception of the area around Lake Wyola, no flood elevation data is available for Shutesbury, so the FIRMs are only of value if they can be accurately overlaid on topographic maps of the same scale. Fortunately, most of the 100-year floodplain areas in town are confined to the areas around the major surface water bodies and constrained to very narrow zones around those water bodies, so flooding damage would be expected to be minimal. In the case of Atkins Reservoir, no housing is allowed around the area, because it is a public water supply. Similarly, the West Branch of the Swift River is an uninhabited area. Elevations around Lake Wyola are 835.7 for the 100-year flood and 835.9 for the 500-year flood, with the normal water elevation being 833.33 feet.

Flood events at Lake Wyola have not occurred during the lifetimes of any Shutesbury residents who are alive today. This is consistent with the fact that flood events considered to be hazardous are those with expected 100-year and 500-year recurrence intervals. Although the expected lateral extent of flooding around Lake Wyola would be minimal, as described above, both the dam and the manually-operated gate valve would allow for release of the additional water volume necessary to mitigate any potential flooding that might occur in the absence of such structures.

It is also important to note that, although the Sawmill River has not been shown as having a flood hazard zone under current conditions with an intact Lake Wyola Dam, downstream areas would undoubtedly experience at least temporary flooding, if the dam were to break. FIRMs only take into account hydrologic conditions in existence at the time the mapping calculations were performed. For the reasons explained above, chronic flooding in any section of Shutesbury has not been observed, nor would it be expected to occur.

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply only to Zone A1 and Zone A, whereas flood insurance is available to all property owners and renters in Zones B and C who choose to purchase it. Shutesbury has not participated in the NFIP in the past, but is in the process of filing paperwork with both the Massachusetts Emergency Management Agency and with FEMA that will allow the town to participate in the program and make residents eligible for flood insurance.

D. VEGETATION

Brief Description of History and Diversity of Vegetation in Shutesbury

Forest dominates Shutesbury's landscape, at the present time, although land-use trends over the past almost 40 years indicate that some previously-forested areas are being converted to residential uses as the town's population grows. Land-use interpretation in 1972 indicated that 94% of the town was forested and 262 acres were in residential use. By contrast, in 2005, nearly 87% of the land surface was covered by forest and the amount of land in residential use had risen to 932 acres (or almost 5.5%).

Shutesbury was not always a forested town, however. An 1830 survey of the extent of forest in all towns of the Commonwealth indicated that only a small percentage of Shutesbury was forested (Map A1), and photographs of the town taken in the nineteenth century show few trees and numerous panoramic views, due to the abundance of agricultural activity in town. The stone walls and foundations deep in the woods are evidence of the once more open and agricultural landscape of Shutesbury. However, even forest that existed through the period of agricultural development was most certainly harvested periodically for timbers and fuel wood. Subsequently, the agricultural practices that had been in place were discontinued. Therefore, most of the forest in town today is the result of the natural succession of fields and pastures, with dense white pine stands often developing in the abandoned agricultural fields. How-

ever, much of this pine was harvested near the turn of the twentieth century, frequently to provide lumber to the pine-box industry. In addition, some trees in Shutesbury probably would have been harvested for the charcoal industry in the abutting town of Leverett, since this industry consumed enormous quantities of wood. The forest that subsequently developed in harvested areas was generally dominated by hardwoods. Further changes to the forest structure occurred when the chestnut blight struck North American forests early in the twentieth century, virtually wiping out the American chestnut, which historically had been the dominant hardwood tree in northern forests. The result of all of these changes is that, although most of Shutesbury is dominated by forest today, virtually none of this forest is representative of the original conditions that existed prior to European settlement.

Evergreen forests of pine and hemlock dominate the lowland and riparian areas north and east of Atkins Reservoir; the areas along Dean Brook, Baker Brook and Roaring Brook; the area northeast of the Dudleyville Marsh and eastward to South Brook; and the area southeast of Ames Pond (Map F1). Deciduous forests dominate uplands and drier, south-facing slopes on the north-south trending ridge located in the center of town and along the Leverett town line, just north of Leverett Road. The forests today are dominated by red oak, black oak, red maple, white pine, eastern hemlock, and black birch. American beech, white birch, yellow birch, sugar maple, quaking aspen, white ash, white oak and black cherry are also present. In addition, pioneer species, such as alders and gray birch, are often present in areas that have opened up when trees have fallen or been cut. Mountain laurel, witch hazel, highbush blueberry, lowbush blueberry, sassafras and other shrubs comprise the understory in many places. In contrast to the forces that shaped Shutesbury's forests over its past history, the major current threat to the forest is the hemlock wooly adelgid, which could decimate a large portion of the mixed-woods forest.

Non-forested areas are relatively rare in Shutesbury today. The 1985 land-use assessment indicated that there were 59 acres of crop land, 72 acres of pasture, and 121 acres of open land. Land-use mapping in 2005 (Janice Stone, 2005) indicates that there were only 2 acres of cropland, 123 acres of pasture, 4 acres devoted to woody perennial nurseries and tree farms, 2 acres of orchards (for a total of 0.8% of the land in agricultural use), and 139 acres of open land (less than 1%). Power line clearings account for about half of this open land, along with some abandoned fields and sandy areas. In what is otherwise a densely-forested town, these areas of open vegetation provide important visual diversity, relatively unique wildlife habitat (including "edge zones" that are important to a number of species), and scenic vistas. In addition, since "*many of the most rapidly declining species in the northeast are associated with the early successional habitat of grassland, shrublands and young forestland that were more abundant in the nineteenth century*" (Berlik et al, 2002), these open areas serve a vital habitat role that is worthy of protection. "*On some of their properties the DFW reclaims old fields with large brush cutting machinery for the purpose of creating habitats for wildlife that require young tree and shrub communities common to early successional landscapes. The species that inhabit these early successional landscapes include common game species and many rare and endangered species. Any open land*

in Shutesbury is thus extremely important as potential habitat for species requiring early successional habitats" (Shutesbury Master Planning Committee, 2004).

Old fields which are returning to forest lands offer a rich and relatively unusual habitat. Under such conditions, pioneer tree species, which require a great deal of sunlight but germinate quickly, take root and spread throughout the fields when mowing and plowing activity ceases. Typically, speckled alder, white pine, gray birch, wild cherry, sassafras and other fast-growing trees establish dominance, while shrubs and herbaceous plants, such as lowbush blueberry, raspberry, meadowsweet and goldenrod fight with invasives such as Russian olive and mulitflora rose to establish a toehold in the fields. Left undisturbed, the trees will eventually shade out many of the sun-loving smaller plants and the forest will reestablish itself. However, most pioneer tree species, such as white pine, alder, cherry, and gray birch, will eventually die off, as larger trees grow and prevent much of the sunlight from reaching the understory, thereby inhibiting seedling growth. In this manner, the pioneer species give way to hardwood species such as oaks and maples, which require less direct sunlight to germinate and grow.

Both forested and non-forested wetlands exist along Shutesbury's rivers, streams, lakes and ponds, including many headwater areas. These wetlands provide flood control and prevent storm damage, filter pollutants to protect surface and groundwater supplies, and provide wildlife and fisheries habitat. The majority of wetlands in town are forested, commonly consisting of an evergreen or evergreen/deciduous mix. The most dominant evergreen in these wetlands is eastern hemlock, with some wetlands also containing white pine, or occasionally, larch or black spruce. Deciduous forested wetlands are predominately red maple swamps, many resulting from previous beaver activity. Shrub wetlands occur around the edges of water bodies, and include deciduous shrubs such as red maple, speckled alder, winterberry, highbush blueberry, red-osier and silky dogwoods, wild cranberry, button bush, and viburnums. In bogs, bog laurel, sweet gale, leatherleaf, cranberry and cotton grass are also present.

A variety of herbaceous plants plants also grow in Shutesbury, in the understory of the forests, in the fields and in the wetlands. These include sedges, grasses, mosses, ferns, emergent and submergent aquatic vegetation and a variety of wildflowers. The list of these plants is too long to include here, but some of the more unusual and interesting plants known to grow in Shutesbury that are worthy of mention are the round-leaved sundew, pitcher plants, cotton grass, the purple fringed orchis, the pink lady slipper and the fringed gentian. Shutesbury also contains a number of species of fungi (i.e., mushrooms) and lichens (composite, symbiotic organisms composed of fungi and either green algae or cyanobacteria, previously known as blue-green algae).

Public Shade Trees

In Massachusetts all shade trees existing within the boundaries of a public way or in other public areas such as parks and cemetaries are protected by law. In many communities, public shade trees exist as regal, old trees lining municipal roads that provide shade and aesthetic variation in expanses of flat, mowed lawns. By contrast, in

Shutesbury, public shade trees tend to blend in with adjacent forest trees in most areas, except for the Town Center. Some regal, old trees exist in a few areas, and these are cherished by town residents along with the rest of the forest. Unfortunately, the ice storm of 2008, which left the town without power for more than a week, and subsequent severe weather events including Tropical Storms Irene and Lee and the October snowstorm in 2011, have had a significant impact on the public shade trees and the forest. Besides the direct damage of many downed and damaged trees along the roadways and in the woods, the response to the damage resulted in significant tree work for a few years by the utility companies to clear any overhanging trees and branches from the roads and electrical lines. Many of the tree-canopied roads have been opened up to the sky in order to prevent similar public safety emergencies caused by power outages, changing some of the rural character of these roads. In addition, some work to widen town roads, especially the Leverett-Cooleyville-Prescott Footprint Road Project in 2006, required removal of public shade trees. A group of large public shade trees on the Town Common were removed from the corner of Prescott and Cooleyville Roads in 2011 to improve public safety at that intersection. Many 80-foot tall white pine trees in the old cemetery on Leverett Road have fallen from storms or preventative tree removal since 2008. In a town with 87% forest cover, the loss of a number of public shade trees may not seem like much, but their loss changes the scenic quality of the roads and public land.

Interior Forest Blocks and Forest Cores

Forests provide a number of important services: recharge of aquifers to provide clean water, scenic beauty, biodiversity, outdoor recreation, forest products and carbon sequestration (USDA Forest Service, 2007). Trees provide shade, transpire moisture, and reduce wind speeds to affect thermal comfort, energy use and air quality by lowering air temperatures, and removing air pollutants through their leaves. They provide noise abatement, aesthetic benefits and improved emotional well-being. Trees and the soils surrounding them remove harmful substances washed off roads and intercept and slow runoff and the flow of precipitation reaching the ground (Nowak et al, 2010).

At the present time, 6,000 acres of open space are lost to development every day in the United States (USDA Forest Service, 2007) and 40 of those acres are lost in Massachusetts (Foster et al, 2010). Since Massachusetts is 60% forested (Foster et al, 2010), most of that loss is through the development of forested land. The 2007 National Resources Inventory by the NRCS shows that the percentage of forested land in Massachusetts has decreased from 62% in 1982 to 53% in 2007. During the same period of time, the amount of developed land increased from 22% to 35% (USDA, 2009). As stated earlier, Shutesbury experienced a decrease of over 7% in its forested cover from 1972 (approximately 94%) to 2005 (approximately 86%). The USDA Forest Service predicts that there will be a 40% to 48% loss of forest (or 1 million to 2.2 million acres) in Massachusetts from 2000 to 2050 (Nowak, 2010).

A number of negative impacts have been documented for development within and adjacent to forested lands (USDA Forest Service, 2007; Stein et al, October 2010; Stein et

al, March 2010; Robert Small and David Lewis, 2009). Increased development adjacent to forests increases fire risks to the forests, wildlife, and to adjacent private properties, contributes to the spread of invasives, fragments fish and wildlife habitat; reduces access to recreational lands and increases conflicts among recreational users.

Development of forested areas results in increased animal injuries and mortality from roads, fences, vehicle collisions, power lines and toxic substances. Animals may be disturbed by increased amounts of light and noise; some species alter their behaviors and change their migration patterns to avoid humans, which may result in a decreased ability to find food and reproduce, while others take advantage of human food and shelter. Increased numbers of people and pets can lead to increased predation and mortality of wildlife. Plants can become isolated and lose the animals needed for pollination or seed dispersal. Forest fragmentation leads to an increase in the types of species that find edges and small forest patches favorable and decline in the types of species that avoid edges and prefer the forest interiors.

Already vulnerable at-risk species, of which there are estimated to be between 6 and 12 in Shutesbury's forests (Stein et al, October 2010), are at heightened risk from the impacts of development, due to their low population numbers. Since species can play multiple roles of predator-prey, pest suppression or parasite-host within communities, the decrease or loss of any one species can critically alter the stability, biodiversity and complexity of the community and ecosystem (Robert Small and David Lewis, 2009). Across the U.S., it is estimated that 42% of all federally-listed threatened or endangered species are at risk primarily because of non-native invasive species (Stein et al, October 2010). The clearing of forested land, along with the importation of non-native species into new residential gardens, can allow invasive species to take a foothold. For example, garlic mustard is currently displacing understory species in forests in the northeastern U.S., with negative implications for animal species (including certain butterflies) that depend on native understory plants. In addition, it is believed that the hemlock wooly adelgid is spreading as a pest species in northeastern forests because infested nursery trees were planted at woodland residences (Robert Small and David Lewis, 2009).

In riparian forests, development can lead to increases in non-native species; weak regeneration of overstory trees; a reduced stem density of native trees; changes in stream temperature, sediment and nutrient loads; increased flooding and a reduced species richness or abundance of fish, amphibians and aquatic invertebrates.

Bird populations are particularly sensitive to the development of forested areas. Development in or adjacent to forested areas leads to increased numbers of generalist bird species, decreased numbers of specialists, decreased species richness, decreased community completeness, increased nest predation and reduced numbers of offspring (Stein et al , March 2010). Neotropcial migratory birds are birds which migrate to wintering grounds in the tropics and subtropics in the winter and return to North America in the spring and summer to breed and feed. A number of migratory bird species are listed as threatened or near threatened, use forests as habitat and are experiencing significant habitat losses due to deforestation. Whereas generalist species have broader

niches, can use a variety of habitats and can tolerate larger changes to the environment, some migratory specialists are very sensitive to habitat changes and require non-fragmented forest or patches of forest in close proximity to other patches to be able to breed successfully. The loss of an acre of wintering habitat can result in 8 acres of breeding grounds being devoid of migratory birds (Kerri Schoenberg and Timothy Randhir, 2010). Shutesbury migrant birds that favor interior forest habitats include: the ovenbird, the scarlet tanager, the Blackburnian warbler, the black-throated blue warbler, and the black-throated green warbler. The breeding success of songbirds is affected by edge, due to the proximity of nesting habitat to predators and nest parasites (such as the brown-headed cowbird). Edge effects can extend 160 feet to 984 feet into forest patches for forest-nesting birds and breeding success is usually considerably higher in the forest core that lies beyond the reach of these edge effects (Robert Small and David Lewis, 2009). Riparian forest habitat can be particularly important to migratory bird species, since they follow riparian corridors during migration and rely on the food availability and abundance in riparian areas.

Protecting and managing forests in source watersheds is critical to protecting surface drinking water supplies, because forests filter water and regulate flow and runoff to downstream locations. The USDA's "Forests Water & People" analysis identified private forests in Massachusetts in most need of protection from development because of their impor-tance to drinking water supplies. Of all of the watersheds in Massachusetts, both the Chicopee and Connecticut Valley watersheds in Shutesbury were given a very high ranking for their ability to produce clean water and this was attributed to their high per-centage of forested land and relative lack of development (USDA Forest Service, June 2009).

The 2004 Shutesbury Master Plan states that the Franklin County Contiguous Forest by Forest Acreage Map shows that "*Shutesbury contains portions of two blocks of forest each greater than 10,000 acres in size. One stretches north of Cooleyville Road and east of Wendell Road into southeastern Wendell and northwestern New Salem. This northeastern forest block is found within the Quabbin Reservoir and Lake Wyola Sub-watersheds. Another 10,000 acre block of contiguous forest lies southeast of Rte. 202 and runs into New Salem. This large southeastern forest block is also in the Quabbin Sub-watershed. Another large block of contiguous forest (5,000 to 10,000 acres in size) lies west of Montague Road. This forest block includes Brushy Mountain, the area in Shutesbury known as the Plains. There are blocks of forest between 1,000 and 5,000 acres in size located south of Leverett Road in the Quabbin, Amethyst, and Adams Brook Sub-watersheds*" (Shutesbury Master Planning Committee, 2004). The Brushy Mountain and the Cooleyville Road/Wendell/New Salem blocks have been identified as Forest Cores on the BioMap2 (see Forest Cores description in a later section of text; Map F3). These are considered to be areas of high ecological value. DFW has also recognized these and other large forested areas in Shutesbury as being part of the top 1% and top 10% largest, intact interior forest blocks in the Commonwealth (Map F1). The acreage ranges for these interior forest blocks were established to be 1,342 to 8,468 for the top 1% largest blocks and 134 to 8,468 for the top 10% largest blocks.

The Nature Conservancy has determined that intact, interior forests in Massachusetts, ranging in size from 10 to 8,600 acres may allow forest ecosystems to recover from changes and disturbances, and allow species richness to be maintained, if a number of groups of these areas, "forest cores" of at least 15,000 acres in size, are protected across the state and located in a manner that will maximize connectivity and distribute risk across geographically-dispersed replicates (Andy Finton, 2009).

A number of government agencies and conservation groups are also recognizing the need to protect "interior forest cores" in order to promote the development of late successional structural elements, such as large living and dead trees, cavity trees and downed woody debris that are important for sustaining native forest biodiversity and maintaining ecosystem services like carbon sequestration. Since most forest stands in the Northeast are less than 100 years old, it is estimated that it will take at least another 50 to 100 years for any of these forests to reach late successional stages (D'Amato et al, UMass Extension Web Site). In such old growth forests, some species occur in greater numbers or productivity, and there is greater habitat diversity provided by the downed and dead vegetation and the increased variation in the forest canopies, and this diversity even carries over into the streams that run through the forests (Foster et al, 2010). The Commonwealth of Massachusetts is recommending having a limited number of forest reserves of 5,000 acres or larger on state lands that represent the diversity of ecosystems in Massachusetts and will address catastrophic disturbances, such as major windstorms or lesser disturbances such as tornadoes or hurricanes that occur every few centuries. Such areas would be buffered from human development by working, managed forestlands located outside the reserves. Such blocks would be allowed to regain their natural condition and serve as habitats for species requiring interior forest habitat away from edge effects. With the wider diversity of tree sizes and ages and the greater amount of dead and downed woody debris than is typically found in sustainably-harvested sites, these reserves would be areas of greater biodiversity. Similarly, scientists at Harvard Forest recognize that less than 1% of the forests in the state are permanently protected from harvesting and other human activities (i.e., unmanaged, old growth forests) and advocate having interior unmanaged "wildland" areas surrounded by managed woodland areas on private forestland throughout the state (Foster et al, 2010).

Clearly, there is a recognition by federal agencies, state agencies and conservation groups that forests provide a number of important services and that large, intact forest blocks are tremendously important to large mammals, a number of migratory birds and some species of conservation interest (Map F4). Because of the importance of forests, the threat of development of forested land across the Commonwealth, and so much of Shutesbury's land being best suited to forest growth (i.e., 72% of Shutesbury's soils are Prime I, II, or III Forestland Soils; Shutesbury Master Planning Committee, June 2004), Shutesbury should prioritize for protection both the BioMap2 Forest Cores and NHESP's top 1% and 10% largest interior forest blocks (Map F3). If possible, within some of these areas, unmanaged "wildland" areas could be set aside, under the direction of a State Forester, to develop into areas of old growth, late successional forest.

Rare Plants, BioMap Core Habitats and Exemplary Natural Communities

The Massachusetts Natural Heritage Atlas contains maps of Priority Habitats of state-listed plant species for protection under the Massachusetts Endangered Species Act (MESA; MGL Ch.131A), the Massachusetts Endangered Species Act Regulations (321 CMR 10.00), the Massachusetts Environmental Policy Act (MEPA; MGL Ch. 30 s. 61-62H), and the Forestry Cutting Practices Act Regulations (304 CMR 11.00). Priority Habitats are based on the known geographical extents of state-listed rare species. Any non-exempt activities that will take place within a Priority Habitat are subject to regulatory review by NHESP to determine if they will result in a "take" of state-listed species. Relative to plants, a "take" means to collect, pick, kill, transplant, cut or process. Exemptions from regulatory review are allowed for certain maintenance, repair, or replacement of existing septic systems, lawns, utilities and rights-of-way, wells, paved roads and parking areas, and commercial or residential structures; the expansion of existing residential structures (by up to 50%) or commercial structures (by up to 20%); the maintenance and improvement of land in agricultural use; or the active management of state-listed species habitat. Projects determined to result in a take may be eligible for a Conservation and Management Permit if the proponent performs an alternatives analysis, can demonstrate that the proposed project will impact an insignificant portion of the local population of the state-listed species, and designs and implements a conservation and management plan that provides a long-term net benefit to the affected species.

Although there are strong penalties for takes, alterations to Priority Habitats, whether deliberate or unintentional, may occur, since proponents may be unfamiliar with the regulatory requirements. In addition, municipal boards, such as conservation commissions, have no regulatory authority concerning alterations to rare plants or non-wetland wildlife and may have little or no familiarity with the specific requirements of MESA. The Forestry Cutting Practices Act affords Priority Habitats an additional level of visibility, regulatory scrutiny and protection. Projects consisting solely of the cutting and removal of trees for the purposes of selling the trees or their derivative products are exempt from filing under MESA. However, such projects must be conducted under an approved Forest Cutting Plan that has been reviewed and approved by DCR. The Forest Cutting Plan is also reviewed by NHESP to determine if there is a potential for harvesting activities to adversely impact a state-listed species. NHESP's recommended modifications to the Forest Cutting Plan are then incorporated into the Plan prior to its approval.

NHESP has developed and periodically updates the Massachusetts List of Endangered, Threatened or Special Concern Species. Endangered species (E) are those in danger of extinction throughout Massachusetts or throughout all or part of their ranges. Threatened species (T) are those that are likely to become endangered in the foreseeable future or which are declining or rare. Special Concern (SC) species are species which have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become threatened in the state. According to NHESP, there are very few known rare plant species in Shutesbury. NHESP has listed two Endangered or Special Concern plant species as occurring in

Shutesbury. These are: dwarf rattlesnake plantain (E) and the ovate spike-sedge (E). It is unconfirmed whether these species still occur in town, since the last recorded sightings for both of them took place in the 1920s.

In 2001, NHESP identified two BioMap Core Habitats within Shutesbury. Such habitats are considered to be the most important areas for the long-term viability of terrestrial and wetland elements of biodiversity in Massachusetts. They contain rare plant and animal populations, constitute exemplary natural communities, and provide habitat for the maximum number of terrestrial and wetland plant and animal species and communities. NHESP considers the contained community types as being ecologically-important areas worthy of long-term protection. Core Habitats are further defined as the amount of acreage needed by some animals for breeding, feeding, nesting, overwintering and long-term survival. Core Habitats cover 7,315 acres or 42% of town.

Plant community types are ranked as being Imperiled, Vulnerable or Secure. Imperiled Communities are defined as those having a limited number of sites (6 to 20) or few remaining acres across the state. Vulnerable Communities typically have 21 to 100 sites or limited acreage across the state. Although Secure Communities have over 100 sites or abundant acreage across the state, they are considered to be excellent examples of the types of communities that they represent and have been identified as Core Habitats to ensure continued protection. Although none of these communities are subject to protection under MESA or any other Massachusetts statutes or regulations, their presence can be used to identify ecologically important areas that are worthy of protection.

Supporting Natural Landscapes are areas surrounding Core Habitats that provide buffers for Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitats. Supporting Natural Landscapes cover 3,007 acres or 18% of the land surface in town.

Core Habitat BM504 encompasses the entire Quabbin Reservoir and surrounding watershed lands (6,974 acres of which are contained in Shutesbury) and contains the following natural communities: Kettlehole Level Bog (Imperiled), Circumneutral Talus Forest/Woodland (Vulnerable), Level Bog (Vulnerable), Oak-Hickory Forest (Secure), Oak-Hemlock-White Pine Forest (Secure), Acidic Talus Forest/Woodland (Secure), Acidic Rock Cliff Community (Secure), Ridgetop Chestnut-Oak Forest/Woodland (Secure), Acidic Rocky Summit/ Rock Outcrop Community (Secure), and Shallow Emergent Marsh (Secure). Muskflower (E) and climbing fumitory (SC) are found in this BioMap Core Habitat and may be present in Shutesbury, although their presence in the Shutesbury portion of the Core Habitat has not been confirmed by NHESP. The supporting Natural Landscape for this Core Habitat extends in an almost-contiguous north-south strip through the centerline of town.

E. FISHERIES AND WILDLIFE

The heavily-forested landscape of Shutesbury provides abundant wildlife habitat for a diversity of species, including some state-listed rare species. Since taking an inventory

of wildlife via direct observation can be a difficult, time-consuming task, due to the huge expanses of undeveloped land that exist in Shutesbury, several alternative sources of information were used to compile the following inventory, including DFG's records of wildlife sightings, NHESP's Massachusetts Natural Heritage Atlas, observations by Shutesbury residents (including information from the Open Space Survey and Massachusetts Biodiversity Days), and several wildlife-related publications including MassWildlife magazine, the *National Geographic Field Guide to the Birds of North America*, several volumes in the Audubon Society Field Guide Series and the two additional wildlife texts listed below.

Shutesbury Wildlife Inventory

The following species have either been sighted in Shutesbury or would be expected to be present here based on what is known about their habitat requirements, regional distribution, migratory patterns, abundance, etc. They are not necessarily reproducing here, but would be expected to use Shutesbury for at least some of their annual habitat needs. Species are presented according to their general habitat needs relative to home range sizes as described in a 1987 University of Massachusetts Cooperative Extension Service publication authored by Richard M. DeGraaf and David A. Richard entitled *Forest Wildlife of Massachusetts: Cover Type, Size Class, and Special Habitat Relationships* and a 1977 book by Arthur J. Godin entitled *Wild Mammals of New England* (published by The Johns Hopkins University Press). Some species require only forest or wetland habit, whereas, others use or require a mixture of habitats, including forests, wetlands and meadows. When evaluating these habitat needs, it is important to note that, in Shutesbury, 6,825 acres are <u>permanently</u> protected as open space and a total of 14,142 acres are currently protected as open space (including Chapter 61 lands); the town occupies 17,408 acres. The following NHESP state-listed species designations are indicated in bold type in brackets following the species name: Endangered **(E)**, Threatened **(T)**, and Special Concern **(SC)**. In addition, the names of state-listed rare species for which sightings in Shutesbury have been confirmed by NHESP are shown in bold. A "CWCS" annotation is also provided inside the brackets for species that were identified as being in greatest need of conservation in the Massachusetts Division of Fisheries & Wildlife's 2006 Comprehensive Wildlife Conservation Strategy (CWCS; Mass. DFG, 2006).

<u>Mammals</u>

As opposed to some bird species, none of the mammals inhabiting Shutesbury are migratory, and their home ranges are correlated with mobility, denning characteristics, food requirements, and the need for connectivity between diverse habitat types. Small mammals tend to only use small home ranges, whereas large mammals can have home ranges of several thousand to tens of thousands of acres. Because of the large blocks of continuous forest in and around Shutesbury, several mammals listed as using greater than 20,000 acres for their habitat have been seen often in town. These animals include the black bear, fisher, bobcat and moose.

Forest Habitats

Size of home range unknown: northern flying squirrel

Less than 1 acre: deer mouse, white-footed mouse, masked shrew, long-tailed shrew, smoky shrew, eastern chipmunk, southern red-backed vole

1 to 5 acres: New England cottontail (CWCS), southern flying squirrel

Between 5 and 10 acres: woodland jumping mouse, gray squirrel, red squirrel

Between 10 and 50 acres: porcupine, snowshoe hare

Between 100 and 500 acres: long-tailed weasel

Between 10,000 and 20,000 acres: gray fox

Greater than 20,000 acres: fisher, black bear (CWCS)

Mixed or Open Habitats

Size of home range unknown: little brown myotis

Less than 1 acre: white-footed mouse, woodchuck, meadow vole, pine vole, southern red-backed vole, star-nosed mole, eastern mole, hairy-tailed mole, southern bog lemming ***(SC;*** CWCS***)***

Between 1 and 5 acres: meadow jumping mouse, northern short-tailed shrew

Between 10 and 50 acres: eastern cottontail, ermine

Between 50 and 100 acres: Virginia opossum

Between 100 and 500 acres: long-tailed weasel

Between 1,000 and 5,000 acres: white-tailed deer, raccoon, striped skunk

Between 10,000 and 20,000 acres: red fox, coyote

Greater than 20,000 acres: big brown bat, bobcat (CWCS), moose (CWCS)

Wetland Habitats

Less than 1 acre: **water shrew (SC,** CWCS**)**

Between 1 and 5 acres: beaver, muskrat

Between 1,000 and 5,000 acres: mink

Birds

Many birds use Shutesbury only during the breeding season, and a few use it only for foraging during short stay-overs during migration. However, there are a number of birds who are year-round residents, and these species are shown in italics.

Forest Habitats

Size of home range unknown: blue jay, red-breasted nuthatch, brown creeper, golden-crowned kinglet, ruby-crowned kinglet, solitary vireo, veery, black-throated blue warbler, black-and-white warbler, scarlet tanager, purple finch, evening grosbeak, American crow, common raven, pileated woodpecker, broad-winged hawk

Less than 1 acre: cedar waxwing

Between 1 and 5 acres: red-eyed vireo, magnolia warbler, black-throated green warbler, Blackburnian warbler, ovenbird, *white-throated sparrow (*CWCS*)*, *yellow-rumped warbler*, winter wren

Between 5 and 10 acres: eastern phoebe, wood thrush (CWCS), *downy woodpecker*, *hairy woodpecker*, yellow-bellied sapsucker, red-bellied woodpecker, *ruffed grouse (*CWCS*)*

Between 10 and 50 acres: *black-capped chickadee*, *white-breasted nuthatch*, eastern whip-poor-will (**SC**,CWCS)

Between 50 and 100 acres: *slate-colored junco*

Between 100 and 500 acres: red-shouldered hawk, *northern saw-whet owl*

Greater than 500 acres: *northern goshawk*

Mixed or Open Habitats

Size of home range unknown: hermit thrush*, European starling,* yellow warbler, rose-breasted grosbeak, rufous-sided towhee (CWCS), American tree sparrow*, house sparrow,* Baltimore oriole*, house finch,* barn swallow, tree swallow, purple martin*, mourning dove,* killdeer, spotted sandpiper*,* turkey vulture*, eastern screech-owl, great horned owl,* hooded merganser, Carolina wren

Less than 1 acre: least flycatcher, *American robin*, gray catbird, Nashville warbler, American redstart, ruby-throated hummingbird

Between 1 and 5 acres: house wren, brown thrasher (CWCS), Canada warbler (CWCS), *field sparrow* (CWCS), grasshopper sparrow **(T**, CWCS**),** *song sparrow*, *American goldfinch*, northern flicker, indigo bunting

Between 5 and 10 acres: great-crested flycatcher, common yellowthroat, chipping sparrow, eastern bluebird

Between 10 and 50 acres: tufted titmouse, eastern peewee, eastern kingbird, *northern mockingbird*, chestnut-sided warbler, brown-headed cowbird, *ring-necked pheasant*, wood duck, green-winged teal

Between 50 and 100 acres: northern cardinal, common nighthawk, American woodcock (CWCS)

Between 100 and 500 acres: sharp-shinned hawk ***(SC***, CWCS***)***

Between 500 and 1,000 acres: barred owl

Between 1,000 and 5,000 acres: wild turkey, *bald eagle* **(T**, CWCS**)**, northern harrier **(T**, CWCS**)**, *Cooper's hawk*, *red-tailed hawk*, *American kestrel* (CWCS)

Wetland Habitats

Size of home range unknown: belted kingfisher, common snipe, Virginia rail, common loon **(SC**, CWCS**)**, American bittern **(E**, CWCS**)**, least bittern **(E**, CWCS**)**, great blue heron, green-backed heron, black-crowned night heron (CWCS), *Canada goose*, common goldeneye, common merganser, double-crested cormorant, osprey

Between 1 and 5 acres; red-winged blackbird

Between 5 and 10 acres: pied-billed grebe **(E**, CWCS**)**, *American black duck (*CWCS*)*

Between 100 and 500 acres: blue-winged teal

Between 1,000 and 5,000 acres: mallard

Amphibians and Reptiles

Some amphibians require vernal pools (i.e., temporary pools present during the spring breeding season that are devoid of fish), others use permanent water bodies to breed and spend the rest of their time in the woods, and others spend most of their adult and juvenile lives in wetlands. The eastern spotted newt is rather unique in that it spends its adult life in water, whereas the post-hatching juvenile "red eft" phase is spent for many (i.e., 2 to 7) years on land.

Forest Habitats

Size of home range unknown: northern dusky salamander, northern spring salamander (CWCS), gray tree frog

Less than 1 acre: wood frog, red-backed salamander

Between 10 and 50 acres: copperhead **(E**, CWCS**)**

Mixed or Open Habitats

Size of home range unknown: four-toed salamander (CWCS), eastern American toad, pickerel frog, gray tree frog, blue-spotted salamander **(SC**, CWCS**)**, northern ringneck snake

Less than 1 acre: northern spring peeper, green frog, northern two-lined salamander, red-spotted newt, northern brown snake, northern red-bellied snake, eastern smooth green snake

Between 1 and 5 acres: northern leopard frog (CWCS), eastern painted turtle

Between 5 and 10 acres: bullfrog, **marbled salamander (T**, CWCS**)**, spotted salamander, eastern garter snake

Between 10 and 50 acres: **wood turtle (SC**, CWCS**)**, eastern box turtle **(SC**, CWCS**)**, Jefferson salamander **(SC**, CWCS**)**, northern black racer, eastern milk snake

Wetland Habitats

Size of home range unknown: common snapping turtle, stinkpot, spotted turtle (CWCS)

Between 1 and 5 acres: eastern ribbon snake (CWCS), northern water snake

Between 5 and 10 acres: bull frog

Fish

Atlantic salmon (CWCS; restricted to Quabbin and adjacent portions of the West Branch of the Swift River), brook trout (CWCS), rainbow trout, lake trout, brown trout, large-mouth bass, smallmouth bass, chain pickerel, yellow perch, pumpkinseed, brown bull-head, golden shiner, **bridle shiner (SC**, CWCS**)**, banded killifish, fallfish (CWCS) and white sucker (CWCS) are found in the surface waters of Shutesbury, as previously described.

Invertebrates

Numerous invertebrates exist in Shutesbury, including many varieties of butterflies, moths, bees and wasps, dragonflies and damselflies, beetles, spiders, molluscs, crus-taceans and worms. Both terrestrial and aquatic invertebrates serve as food sources for numerous mammals, fish, birds, reptiles and amphibians, whereas others serve to pollinate flowering plants. In 2009, NHESP listed the **ski-tipped emerald (SC**, CWCS**)**, a type of rare dragonfly, and the **New England bluet (**CWCS**)**, a type of damselfly, as having been found in Shutesbury. In 2012, the New England Bluet was de-listed and changed from its previous status of Special Concern. In addition, NHESP has listed another rare species of dragonfly, the spatterdock darner **(SC),** as living on the Quabbin Reservoir wetlands, although sightings of this dragonfly have not yet been confirmed in Shutesbury, to date.

Wildlife Habitat and Associated Recreational Opportunities in Shutesbury

The impressive wildlife diversity in Shutesbury is due in large part to the diversity of wildlife habitats that exist here. Extensive forests support many species. Lake Wyola, the Quabbin Reservoir, and several small streams support other species and there are also 14 certified vernal pools present. The Massachusetts Audubon Society has desig-nated the Quabbin Reservoir watershed as an Important Bird Area or IBA (Map F2). "*An Important Bird Area is a site that provides essential habitat to one or more species*

of breeding, wintering, or migrating birds and supports high-priority species, large concentrations of birds, exceptional bird habitat, and/or has substantial research or educational value. The sites may vary in size but are usually discrete and distinguishable in character, habitat, or ornithological importance from surrounding areas and should be large enough to supply all or most of the needs of birds during the season for which the IBA is important" (Massachusetts Audubon Society, 2010). There are three state-listed bird species that breed in this IBA: the common loon, the bald eagle and the pied-billed grebe. In addition, the large tracts of contiguous forest in the watershed support significant breeding populations of songbirds, including 35 high-conservation-priority species.

Wildlife populations use habitat areas for supplies of food and water, and for shelter, mating and raising young. Many species rely on a variety of habitats during different periods within their life cycles and species diversity is often greatest in areas where several different habitat types lie in proximity to one another, such as fields located next to forests, or forests located next to wetlands. Similarly, large areas of non-fragmented forest, such as those that are present on Quabbin Reservoir watershed lands can be important in providing cover, in the form of wildlife corridors, for large animals having large home ranges that need to move from one undeveloped area or particular habitat type to another. When evaluating land protection needs in Shutesbury, it is important to note that some of the larger mammals have home ranges spanning several thousand or tens of thousands of acres of forest or mixed habitats, which may include areas in adjacent towns, in addition to Shutesbury. Therefore, land-protection efforts should focus on protecting contiguous larger acreages of land containing several habitat types or important wildlife corridors, rather on protecting small, isolated parcels of land, unless the latter contain important rare species habitat.

Hunting on Quabbin Reservoir Reservation lands located directly around Quabbin Reservoir and east and south of Route 202 is restricted to a controlled, special-permit, two-day deer hunt for forest management purposes. West and north of Route 202, DCR also owns 4,147 acres of Off-Reservation Lands in Shutesbury where hunting is allowed for pheasant, ruffed grouse, quail, woodcock, turkey, various ducks, Canada geese, cottontail rabbit, black bear, coyote, white-tailed deer, gray squirrel, red fox, gray fox, opossum, raccoon, and snowshoe hare. Hunting seasons vary on a yearly basis, but generally take place in fall and late winter or early spring. No hunting is allowed in Shutesbury State Forest, but hunting is allowed to take place on all private lands that are not posted. Trapping is also allowed to take place on Off-Reservation Lands, in the Shutesbury State Forest and on non-posted private lands. All trappers must be licensed, have had a trapper education course and have their traps registered. Trapping seasons vary each year but generally begin on November 1 and run for 1 to 1.5 months for fox, coyote, weasel, bobcat, fisher, mink and otter; for 4 months for raccoon, opossum, skunk and muskrat; and for 5.5 months for beaver. Hunting and trapping activities come under the jurisdiction of DFG.

The large expanses of undeveloped area in Shutesbury, especially those traversed by trail systems, support additional recreational opportunities, such as hiking, nature-

watching, cross-country skiing, snowshoeing, mountain biking, and snowmobiling on the lands are not posted or otherwise restricted by statute. Hiking, nature study and snowshoeing are allowed on Quabbin Reservation Lands, whereas ATV riding, mountain biking, camping, horseback riding, snowmobiling and cross country skiing are prohibited. Off-Reservation Lands have the same allowed and prohibited uses, except that cross-country skiing is allowed.

Rare Wildlife Species and BioMap Core Habitats

NHESP has confirmed the presence of six threatened (T) or special concern (SC) wildlife species in Shutesbury. These are: the marbled salamander (T), the wood turtle (SC), the bridle shiner (SC), the water shrew (SC), the New England bluet (SC) and the ski-tipped emerald (SC). The Massachusetts Natural Heritage Atlas contains maps of Priority Habitats of state-listed wildlife species (including both upland and wetland species) for protection under the MESA, MEPA, and the Forestry Cutting Practices Act, and Estimated Habitats of Rare Wetlands Wildlife for protection under the WPA Regulations. Priority and Estimated Habitats are considered important to the growth and survival of rare wildlife species by providing food, shelter or living space for breeding, resting, migration or winter habitation. Estimated Habitats are a subset of the Priority Habitats and are based on the geographical extents of state-listed rare wetlands wildlife. In the case of Shutesbury, however, the boundaries of Priority and Estimated Habitats coincide. NHESP has mapped three main areas of Priority Habitats and Estimated Habitats (Map F2). These areas are: around and along the Quabbin Reservoir, including the southern-most mile of Atherton Brook and the southern-most 1.5 miles of the valley of the West Branch of the Swift River; around Lake Wyola, Ames Pond and its outflow stream, and South Brook, including the Footit Swamp and both tributaries; and west of January Hills and north of the Atkins Reservoir. Altogether they constitute approximately 5.5% of the town area.

Relative to state-listed animal species, a “take” means to harass, harm, pursue, hunt, shoot, kill, trap, capture, collect, process, or to disrupt the nesting, breeding, feeding or migratory activity of the animal. In a manner similar to that previously described for plants, NHESP reviews all projects that will take place within Priority Habitats for rare wildlife species for compliance with MESA, including those filed under the Forestry Cutting Practices Act. For several species of rare wildlife (i.e., common loon, eastern box turtle, spotted turtle, wood turtle, blue-spotted salamander, Jefferson salamander, and marbled salamander), NHESP has also developed species-specific management guidelines, termed Conservation Management Practices, that may be incorporated into a Forest Cutting Plan prior to its filing to maximize the probability that the plan will be approved by NHESP without the need for any modification. In addition, rare wetlands wildlife species benefit from additional regulatory review under the WPA Regulations. Projects that will take place within mapped Estimated Habitat of Rare Wetlands Wildlife must undergo review by NHESP before an Order of Conditions can be issued by the local Conservation Commission that allows the proposed work to take place. Because they are under the purview of the Conservation Commission and because the Conservation Commission must incorporate any recommendations made by NHESP into the

Order of Conditions, alterations to rare species habitats in wetland areas are subject to an additional level of scrutiny and visibility under the permitting process that affords such habitats additional protection.

Additional state-listed species have been confirmed to be present in portions of the Core Habitat BM504 around Quabbin Reservoir (previously described in Subsection D) of which Shutesbury land is a part, and are likely to be present in the portion of the Core Habitat that is located within Shutesbury. NHESP has identified the following state-listed species as being present in Core Habitat BM504: common loon (SC), bald eagle (E), grasshopper sparrow (T) water shrew (SC), southern bog lemming (SC), wood turtle (SC), eastern box turtle (SC), blue-spotted salamander (SC), marbled salamander (SC), New England bluet (SC), and spatterdock darner (SC). In addition, Shutesbury contains the appropriate types of undeveloped habitat necessary for a number of other state-listed species, and a number of these have been sighted in adjacent towns, so they may be present in Shutesbury, as well, although their presence has not been verified by NHESP, to date.

Core Habitat BM640 encompasses the riparian wetlands along two miles of Roaring Brook and several of its tributaries in Shutesbury. It is bounded along its southern edge by Leverett Road and along it eastern edge by Montague Road. This area does not contain any exemplary natural communities, but is listed as important habitat for the water shrew (SC). The BioMap Supporting Natural Landscape of this Core Habitat extends in a strip along the western boundary of town from the Core Habitat area north almost to the northwestern corner of town. NHESP has also identified an additional Supporting Natural Landscape area that lies along the Amherst border in the southwestern corner of town. As previously stated, neither BioMap Core Habitats nor Supporting Natural Landscapes are afforded special protection under Massachusetts laws or regulations, but are considered to be areas worthy of protection and should be taken into consideration when making land-protection decisions.

Important Habitat as Reevaluated under BioMap2

On September 30, 2010, DFG and the Nature Conservancy released a comprehensive biodiversity plan, the BioMap2 (Mass. DFG and the Nature Conservancy, 2010), that revised and integrated NHESP's 2001 BioMap Plan and 2003 Living Waters Plan and evaluates natural resources located in each of the Commonwealth's eight ecoregions. (Shutesbury is located in the Worcester Plateau Ecoregion.) DFG and the Nature Conservancy determined that there was a need to update the original BioMap because of a number of changes that had occurred since the original BioMap was developed. The changes included: the amount of additional data collected since 2001 (including new records that were added to the NHESP database); improved mapping of state-listed species' habitats; development of a better understanding of what makes ecosystems resilient and of the implications of global warming (such as a disruption of species-dependent ecological conditions and processes) and the increase in the amount of developed land throughout the state (resulting in fragmentation of habitats; increased mortality of birds, mammals, amphibians and reptiles; increased pollution and the

spread of invasives). The BioMap2 seeks to conserve lands and waters that are considered to be the most important for maintaining biodiversity and enhancing ecological resilience to climatic change, and targets for preservation large, intact, well-connected ecosystems and landscapes.

A major new focus of the BioMap2 is on climate change and how land conservation strategies can be focused to combat potential, future, climate-change-induced impacts. Global climate change will affect species migrations and dispersal events, uncouple symbiotic relationships, uncouple predator-prey relationships, cause interactions with new pathogens and invasives, increase the frequency and intensity of insect infestations, change species distribution ranges, result in habitat losses, result in changes infecundity and population structure, cause changes in sex ratios, result in changes in competitive abilities, and cause increased physiological stress causing direct mortality or increased disease resistance. To offset these climate-change-induced effects, the BioMap2 prioritizes the protection of larger habitats, natural communities and ecosystems (such as wetlands, forests, and river systems), because they support larger populations of native species and greater numbers of species and are, thereby, better able to help plants and animals survive extreme conditions. The BioMap2 contains a comprehensive approach that includes protecting a full range of ecosystems and ecological settings, ranging from intact landscapes that allow connectivity between habitats, to ecosystems that support distinct ecological process like flooding or windstorms (to create diverse niches), to areas that are least-impacted by development (to minimize the effects of non-climate stressors).

The BioMap2 now focuses on two major components: Core Habitats and Critical Natural Landscapes. Core Habitats are "*critical for long-term persistence of rare species and other species of conservation concern, and also diversity of natural communities and intact ecosystems*." Critical Natural Landscapes complement Core Habitat and include "*large natural Landscape Blocks that provide habitat for wide-ranging species, support intact ecological processes, maintain connectivity among habitats and enhance ecological resilience"* and also include upland buffers around wetlands and aquatic Core Habitats "*to ensure their long-term integrity*" (MassDFG and The Nature Conservancy, 2010). Core Habitats and Critical Natural Landscapes overlap in many regions. Core Habitat and Critical Natural Landscape areas that have been mapped for Shutesbury appear on Map F3.

Core Habitats

Core Habitats include a combination of Living Waters habitats (now Aquatic Cores), NHESP Priority Natural Communities with limited distribution and also the best examples of the more common types of communities, Forest Cores, exemplary cold-water and cool-water stream habitats, habitats identified in Massachusetts DFG's CWCS, and habitats for species identified under MESA (i.e., MESA Habitats). Habitats for rare, vulnerable or uncommon plant and animal species; high-quality wetland, vernal pool and aquatic habitats; and intact, forest ecosystems are included.

The CWCS, also known as the State Action Wildlife Plan, was developed so that the state could be eligible for federal funds to conserve animal species of greatest conservation need. The "*loss of habitat and secondary impacts to wildlands and wildlife from increased water usage and pollution are the main threats addressed in the plan*" (Mass. DFG, 2006). The CWCS addresses 22 habitat types (from large-scale forests down to small-scale vernal pools) and 257 species in greatest need of conservation. Although MESA-listed species are covered under the CWCS, the plan also covers 80 additional species of special conservation concern, including some invertebrates, whose habitats are at greatest threat from development, habitat fragmentation, the use of in-stream dams, etc. At-risk species include certain fish, amphibian, reptile, mammal and bird species already identified in Shutesbury's Wildlife Inventory earlier in this section. Of particular interest are species such as bear, bobcat and moose, which have large home ranges.

Forest Cores were selected as the best examples of large, intact forests that are least impacted by roads and development (i.e., traffic, pollution, agriculture, etc.) and provide critical habitat for numerous woodland species, such as certain neotropical migrating bird species, that are dependent upon relatively pristine forest interior habitats for survival. To be included, Forest Cores had to meet minimum patch size requirements which ranged from 500 acres in the eastern part of the state to 3,000 acres in the western part of the state. Since Shutesbury lies in the Worcester Plateau Ecoregion, its Forest Cores had to meet a size requirement of 1,500 to 2,000 acres.

BioMap2 Wetlands were selected from the least-disturbed, high-quality wetlands in undeveloped landscapes, having intact buffers and little fragmentation or other stressors associated with development. Individual wetland types (such as marshes, bogs, shrub swamps, forested wetlands, etc.) were combined into wetland complexes and only those greater than 10 acres in size were selected for inclusion in BioMap2. Wetland complexes of these sizes are considered to support critical functions such as natural hydrology and diverse plant and animal habitat and have the ability to maintain these functions into the future. Each selected complex was further differentiated in the mapping based on its ecological setting or substrate type.

Vernal Pool habitat is considered to be important to the survival of those amphibian and invertebrate species inhabiting the pools and the surrounding upland forests provide important habitat for amphibians foraging, overwintering and migrating between pools. In developing BioMap2, DFG and the Nature Conservancy recognized the importance of having connectivity between vernal pools, because breeding success shifts among pools with changing environmental conditions. Under BioMap2, the previously-mapped locations of known vernal pools were no longer taken into account. Instead, "Potential Vernal Pool" habitat locations were identified from aerial photographs. The top 5% most-interconnected clusters of these Potential Vernal Pools were mapped and each cluster was further buffered to include the pools and the surrounding habitat needed for successful breeding, dispersal, overwintering, foraging and migrating, to combat the potential effects of climate change.

Aquatic Cores were mapped to protect fish and other species of Special Conservation Concern. The Aquatic Cores consist of intact river corridors in which important physical and ecological processes occur, plus 30 meters of buffer on either side of the core, as well as any adjacent wetlands which are contained partially or wholly within the buffer.

Critical Natural Landscapes

Critical Natural Landscapes are intact landscapes that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames. Critical Natural Landscapes include: natural Landscape Blocks that are minimally altered by development and provide connectivity among habitats; buffers for wetlands, rivers, and some aquatic species habitats delineated to help enhance their long-term integrity; and large intact areas important for the conservation of a wide-ranging, habitat-generalist Special Concern species (such as the wood turtle). Critical Natural Landscapes include: the largest Landscape Blocks in every ecoregion, adjacent upland habitat supporting Aquatic Cores, and adjacent upland habitat supporting Wetland Cores.

Landscape Blocks are large areas of intact, predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds. Areas containing pastures and power-line rights-of-way were also included, because they are less-intensively-altered than most developed areas and provide habitat and connectivity for many species. The most intact and least fragmented areas were selected, because these areas are considered to be the most capable of maintaining dynamic ecological processes such as buffering, connectivity, natural disturbance and hydrology that are necessary for supporting biodiversity under the stress of climate change.

F. SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

Because of the heavily-forested landscape, few of Shutesbury's scenic areas consist of distant vistas anymore. However certain locations in town, where a power-line cut or clearing exist, provide lovely views of Mt. Wachusett, Mt. Monadnock, Mt. Greylock or the Holyoke Range. There is also an incredible scenic vista along the fields at Banfield Farm in the southern part of town. The 1982 Massachusetts Landscape Inventory selected Quabbin Reservoir and adjacent lands as a scenic landscape, based on its wilderness qualities, dramatic views of forested hills and extensive waterscape. One such view appears on the Shutesbury town seal. The tree-canopied "S-curves" of Leverett Road, which wind along Roaring Brook, and "the cascades" on Dean Brook are often mentioned as especially scenic spots in town. In addition, Lake Wyola, Atkins Reservoir, Ames Pond, and Dudleyville Marsh (a.k.a. Dudleyville Ponds or Brown's Pond) are listed as favorite scenic spots in the town's past Open Space and Recreation Plan Surveys (Map 5).

There are many pleasant trails through town, including the regional Robert Frost and Metacomet-Monadnock (M&M) Trails, the wood roads and trails of the Quabbin Reservoir watershed, many private dirt roads and several power line easements under active

vegetation management. All these trails offer passage through beautiful forests, and past clear running streams, old stone walls and foundations. The M&M Trail received designation, in March 2009, as a new National Scenic Trail, called the New England National Scenic Trail. It extends from Connecticut to New Hampshire. Coincident with the designation, a large part of the M&M Trail on private land in Shutesbury is being relocated to areas crossing mostly state land, including Quabbin Reservoir Lands. The paved and gravel roads in Shutesbury are regularly used by local walkers, runners and bicyclists, and the S-curves are often used as a scenic (and challenging) bike route by bicyclists from many other towns.

Scenic landscapes, old roads, and historical sites contribute to the scenic resources and unique environments in Shutesbury (Map 5). Elements of the town's distinctive nineteenth-century character include narrow lanes, stone walls, six old cemeteries and several old farm houses. When residents were forced to move from portions of Shutesbury's most fertile farmland along the West Branch of the Swift River to allow construction of Quabbin Reservoir in the late 1930s, old wood roads, stone walls, foundations of farmsteads and mills, horticultural plantings, wells and cisterns were left behind that are still visible today. A 1998 Metropolitan District Commission historical site survey identified 31 historical archeological sites in the Quabbin Watershed Reservation Land that lies in Shutesbury. In addition, the Massachusetts Historical Commission has identified over 70 prehistoric sites within the Quabbin Reservoir Reservation, of which Shutesbury land is a small part. Artifacts have been identified that suggest the Swift River Valley was occupied by Paleo-Indian hunters and gatherers, followed by fisherman and then farmers from between 9,500 and 12,000 years ago until 450 years ago when the colonial settlement period began. At that time, the Pocumtucks and Nipmucs inhabited the area. No doubt, additional investigations of these undisturbed sites may yield more artifacts and archeological information.

The Shutesbury Town Common is an attractive, open, grassy area at the top of the hill in the center of town where the town's three major roads (Wendell, Cooleyville, and Leverett) converge. The Town Common is surrounded by several attractive, old buildings, including the community church, built in 1827. This is a typical New England church with a white wooden exterior and a tall spire. The church has undergone important repairs, especially to the tower and spire, although there are uncertainties regarding its ownership and future. The attractive "cottage style" one-room library was built in 1902 and partially renovated in 2007 to provide Americans with Disabilities Act (ADA) compliant access and restrooms. The library provides free, high-speed Internet access in a town where over half the households lack such access. The Town Hall Annex (the original Town Hall that was built in 1829) is an attractive Greek Revival building that was recently restored. The Town Hall was built in 1950 as the first centrally-located school in town and sits across Cooleyville Road from the Common. The Common also contains a four-sided, small wooden structure that dates back to 1837 and serves as a guidepost containing directions and distances from Shutesbury to many places, including Boston, Worcester, Northampton, Erving, Warwick, New Salem, Keene (New Hampshire) and Prescott (no longer existing, since it was flooded during the construction of the Quabbin Reservoir in the 1930s).

Elsewhere in town, 2 of the 10 original one-room schoolhouses built before 1871 still stand in their original locations on West Pelham and Schoolhouse Roads. The Bennett House at Lake Wyola Park, dating from 1768, and subsequently modified and renovated many times over the years, served for many years as an inn. The house is associated with a beautiful, two-story barn which was built between 1870 and 1880 and contains a suspended, wooden dance floor. Both structures are now owned by the Commonwealth of Massachusetts, and DCR has committed to preserving them, although it has no specific plans or funding for doing so.

There are several other interesting and unusual sites in town that should be protected for archeological and historical reasons. The most popular are probably the Ames Hill (Levenger property), Mount Mineral (Temenos property), and Freeman Road "beehive caves." The beehive caves are oval, beehive-shaped underground "rooms" constructed with hand-placed rocks. These structures contain a small opening at ground level. Similar structures have been found in Leverett, Pelham, Wendell, Belchertown and Leyden, as well as in parts of Vermont and New Hampshire. The origin and functions of these structures are unknown and have been the subject of dispute by the various historians and archeologists who have studied them, but various theories have attributed their construction to Native Americans, ancient Irish monks (circa 1,000 A.D.), or early settlers. Land owned by the Sirius Community east of Baker Reservoir contains a series of hearthstone-shaped stone structures of unknown origin and function. There are also unique stone cliff carvings of a more contemporary nature which exist on Mount Mineral, as well as some remnants of the nineteenth century Mount Mineral Springs Hotel that served guests seeking the healing waters of the mineral springs (iron, sulphur and manganese) located there. The Old Town Pound on the southern side of Cooleyville Road, 0.4 miles east of the center of town, is another landmark worthy of protection. This structure is a 50 foot by 40 foot, rugged, stone-walled enclosure built in 1806 by early residents to hold stray livestock. The enclosure was originally 72 inches high, but now stands only 30 inches high in some places. There are also a few old cemeteries in town containing gravestones dating back to the 1800s and ranging in condition from poor to good.

In addition, there are other intriguing stone structures located in the woods in different parts of town. A site with large, carefully-placed and arranged "altar stones" is located in the northwestern part of town. Some very nice stone foundations of early houses and barns can also be found along most roads in town, as well as back in the adjacent woods. Such structural remains give an indication of the locations of past clearings and farm sites. One such site is the Town Farm south of the Town Hall. Throughout town, well-preserved, beautiful stone walls also give further insight into Shutesbury's agricultural past.

Forestry was an important industry in town during the last century, therefore the remains of a number of late nineteenth/early twentieth century sawmills can be observed at a number of sites in town: the Thompson Camp and Ober Sawmills (on Roaring Brook near the "high bridge"), the Ames Sawmill (at Ames Pond), the Dudley Sawmill (at the Dudleyville Marsh), the Adams-Fitts Sawmill (that operated for 150 years on the Ban-

field property), and the Albert Baker Sawmill on Dean Brook west of West Pelham Road and south of Baker Road (Map A2). The remains of this latter sawmill are located on private land and include a well-preserved dam, a mill foundation, a tailrace tunnel and a small stone bridge. West of Baconville and south of Sand Hill Road, a second Albert Baker Sawmill was built. Today, the remains of an earthen dam, a concrete dam and a diversion channel can be seen at the site. The site of a former wooden rake and scythe factory (Crossman's Mill and Rake Factory) is located nearby, at a point approximately 900 feet upstream of where the M & M Trail crosses Dean Brook. East of Cooleyville Road, there are several more mill sites, including the Frost Mill, which still retains parts of the mill apparatus. More mill and dam stone works are located in the northeastern corner of town, including a number of stone "columns."

Important natural sites that should be protected are the Dean Brook cascades, "the boiling springs," Footit's floating sphagnum bog, the Montague Road bog, the old bog on Pelham Hill Road, the "High Bridge" waterfall, and Meetinghouse Hill, the highest point in town. The cascades are probably the most outstanding natural feature in Shutesbury. They are located off Sand Hill Road on a portion of Dean Brook that drops 55 feet in elevation over a distance of 400 feet, creating a series of small waterfalls in a miniature gorge, and ending in a large pool. At the base of the waterfalls, is a 35-foot diameter pool that is 4 feet deep. Hemlock, yellow and white birch, mountain laurel and witch hazel grow on the slopes surrounding the waterfalls. Due to the steep slopes and shallow-depth-to-bedrock soils, this location is a beautiful, but fragile, site. Although this area is located on protected Town of Amherst watershed land, it is susceptible to overuse by the public. It is now posted for no trespassing as Amherst Watershed Land.

The boiling springs are found in The Plains section of town in a stand of hemlocks that is located west of Montague Road, and consist of three distinct spots where groundwater bubbles to the surface through fine, white sand. The largest spring pool has a diameter of 10 feet and contains three distinct areas where water bubbles to the surface. Other smaller springs are located 200 yards to the north. The purple fringed orchis (a member of the orchid family) and watercress have been observed at the springs. The springs are located on private property and are difficult to find from the road.

Footit's Bog, located off a trail off of Freeman Road, is approximately 2 acres in size and a fine example of a floating sphagnum bog. Footit's Bog contains a variety of wetland plants: pitcher plants, water lilies, swamp loosestrife, bog laurel, leatherleaf, wild cranberry, witherod, speckled alder, highbush blueberry, red maple and black spruce. Because of its relatively obscure location on private land, it has so far remained protected from alteration. The bog received added and more permanent protection when a CR was placed on the land containing the bog.

Another nice example of a true bog, with sundews, cotton grass and pitcher plants, is located off Montague Road on the western side of the Dudleyville Marsh. This bog is threatened by the drastic decrease in water level due to the state-mandated retirement of the old private dam that formerly impounded water in the area. The change in hydrology may eventually result in an alteration to the bog, including invasion by non-bog

species. The town should consider constructing a trail and boardwalk on the Conservation Commission's property that abuts the marsh. This would enable the public to enjoy views of this attractive bog before it undergoes transition.

An old bog in its final stages of succession is located west of Pelham Hill Road and north of Leonard Road. It is 8 acres in size and contains no open water because it has been completely filled in with organic accumulation. The area is covered in sphagnum moss and contains silky dogwood, speckled alder, arrowwood, red maple, gray birch, ash, and American elm. In combination with the other bogs in town, the area could serve as an educational resource for local science classes.

The "High Bridge" waterfall is located on Roaring Brook approximately 0.5 miles east of the Shutesbury-Leverett line. The waterfall begins at a point just below the remains of one of the former sawmills and is followed by a cascade-type waterfall that extends for an approximate distance of 250 feet downstream.

Meetinghouse Hill is the highest site in town, at 1,305 feet in elevation. It is located approximately two miles north of the present Town Hall.

Some of the interesting and unique features can be located on Map 5. At present, there are no specific plans for protection of any of these privately-owned areas.

G. ENVIRONMENTAL CHALLENGES

From the standpoint of potential environmental concerns, Shutesbury is fortunate in many respects, due to a number of factors that limit current and future development, including the Watershed Management Act Regulations, the Title 5 Regulations, the WPA Regulations, and the zoning bylaw that was extensively revised in 2008.

Under the Commonwealth's Environmental Justice Policy, all residents "have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment." The policy defines environmental justice as " the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits" and states that " no group of people, because of race, ethnicity, class, gender, or handicap bears an unfair share of environmental pollution from industrial, commercial, state and municipal operations or have limited access to natural resources, including greenspace (open space) and water resources." Environmental justice populations are "those segments of the population that EOEEA has determined to be most at risk of being unaware of or unable to participate in environmental decision-making or to gain access to state environmental resources." Because of population and income characteristics, there are no EOEEA-designated environmental justice communities in Shutesbury. However, due to the distribution of open space areas throughout town and the access of all residents to motorized transportation, Shutesbury meets any environmental equity requirements that would exist if environmental equity populations were present.

Shutesbury's open space (permanently-protected and otherwise) and recreational areas are located throughout the town, making a number of them within walking distance for most town residents. In addition, since Shutesbury does not have any shops, restaurants or movie theaters in town, all town residents must have access to transportation for necessities such as food and clothing, or entertainment. Access to transportation means that most or all residents have ready access to other town open space or recreation areas that are not within walking distance for them. Hence, environmental equity does not play the role in Shutesbury that it does in some of the larger, urban communities in the region or in the Commonwealth, where environmental justice populations exist and open space and recreational lands are relatively rare commodities, located at great distances from highly-developed, industrialized, urban, low-income, residential neighborhoods.

As previously discussed in Section C of this chapter, chronic flooding has not been a problem in Shutesbury, nor would it be expected to be. Steep topography limits flooding in many areas and very few areas have been mapped by FEMA as being subject to 100-year and 500-year frequency floods. In the limited areas where these flood zones occur, the horizontal extent of flooding would be very minimal. Furthermore, most areas are uninhabited and will remain that way, due to construction limitations and/or open space protection statuses. In the area around Lake Wyola, where the most extensive Zone A exists, the dam's spillway and manually-operated gate valve will likely allow the lake's water level be lowered enough to prevent flooding of the residences located on the lakeshore, should a major flood event occur in the future.

Shutesbury currently has no landfills and just one auto junk yard. Industrial and commercial development is controlled by topography and water-supply limitations due to low-yielding bedrock wells. The low and variable yields of the bedrock aquifer, the limitations imposed on septic system construction by poor soils and high groundwater, and the large percentage of permanently-protected and partially-protected (i.e., land in Chapter 61) land in town, mean that residential development will be restricted from certain areas of town and limited in others. Furthermore, existing recycling programs, hazardous and bulky waste collection days, and programs to collect fluorescent light bulbs and batteries all encourage proper disposal of hazardous wastes and other materials that could contaminate soils, groundwater and surface water. According to MassDEP's statistics, in 2008, Shutesbury had a recycling rate of 48% (total tons of waste diverted through recycling, composting, hazardous waste recycling and bulky waste collections/total tons of waste generated). Since 1997, Shutesbury's recycling rate has averaged 47%, with an average of 60% in the years 2009 through 2013.

In addition, since many lots contain small cleared areas that are fairly shady and, thus, not conducive to growing lush lawns or bountiful vegetable or perennial gardens, it appears that fertilizers and pesticides are used sparingly by local residents, relative to surrounding urban areas. Furthermore, while road salts are applied during winter sanding operations, the health of roadside trees and other vegetation indicates that salt levels also may not be as excessive as in urban areas. Although potential impacts to soils, groundwater and surface water cannot be confirmed without collection and ana-

lysis of samples or surveying residents about their lawn and gardening practices, it would appear that Shutesbury's groundwater and surface water is at a lower risk of buildup of nutrients and other potentially-harmful chemicals than is likely in other communities from these sources.

For many years, there were only six reported releases of hazardous materials in town, all of which occurred between 1994 and 1997. Four of these were residential fuel oil releases from underground or above ground storage tanks, one was a gasoline release from an underground storage tank at the Town Highway Department facility, and one was a roadway vehicle spill of diesel fuel. A few minor releases occured in 2008 and 2009, including two utility-related releases involving tranformer oil and a release of hydraulic oil at one of the gates to Quabbin. All of these releases have been remediated.

In May 2008, an additional release of gasoline from an abandoned, 750-gallon underground storage tank was discovered at the Fire Station during the reconstruction of Leverett Road. This release is currently being remediated by the town under the oversight of a Licensed Site Professional (LSP). A number of soil borings have been advanced and groundwater monitoring wells installed, surface water in the area of contamination breakouts in the wetland has been sampled and indoor air in the fire station and in several adjacent residences has been evaluated. No private drinking water wells have been contaminated above Massachusetts Drinking Water Standards, however, certain groundwater monitoring wells have been found to contain dissolved concentrations of petroleum hyrocarbons in excess of groundwater cleanup standards under the Massachusetts Contingency Plan ("21E"). In August 2010, over 3,000 tons of contaminated soil was removed from areas around the fire station and under Leverett Road. In September 2011, continuing goundwater monitoring below the fire station indicated that, despite the excavation of the contaminated soil, the area under the fire station was still serving as a source of ongoing contamination to downgradient areas of groundwater and wetland. A soil vapor extraction pilot test performed in October 2011, indicated that remediation using this technolgy would be too slow, costly and ineffective. The town's LSP proposed using in-situ chemical oxidation with Oxygen BioChem, a proprietary mixture of sodium persulfate and calcium peroxide, to treat the residual contamination in soil and groundwater below the fire station building. MassDEP approved the procedure for performing this in-situ chemical oxidation procedure on May 15, 2012, but required monitoring of the water in the adjacent wetland and groundwater wells and the air in the fire station during and after the injection. In summer 2012, 1,200 gallons of Oxygen BioChem were injected at four injection points below the fire station building by Redox Tech, LLC. Early rounds of groundwater monitoring results indicate the drinking water wells are not being adversely impacted, and rises in groundwater levels, dissolved oxygen, pH, specific conductance and oxidation-reduction potential in monitoring wells indicate that the process is having the desired effect on the contamination. The injected chemicals are expected to provide long-term biological oxidation of the hydrocarbon contaminants.

Since Shutesbury has no landfills or industries, and Route 202 is the only major road running through town, there is little likelihood that there will be many more releases, with residential fuel oil releases being the most likely source. However, the junkyard located off Pratt Corner Road is a potential source of oil and hazardous materials pollution to groundwater and nearby surface water streams that may merit closer examination by the town.

In spite of its current favorable environmental outlook, Shutesbury is not free of potential environmental concerns. One of the principal environmental concerns is the current and future potential for land-use conversion from a forested condition, which contributes a wealth of benefits to the community (e.g., scenic character, wildlife habitat, clean air and water, carbon sequestration, numerous outdoor recreation opportunities, wood products), to a developed condition, which puts a strain on community resources (such as the school, fire protection, police services, and the highway department), thereby creating additional financial burdens for the town. Acres of open space require little in the way of community services, and contribute more than their share in terms of tax revenues. For example, annual payments from DCR's Watershed Management Payment in Lieu of Taxes Program for the period from 2000 to 2007, have ranged from $81,429 to $250,019. Residential development, on the other hand, requires more in terms of community services than it contributes on a per-acre tax basis, unless tax rates are set at high levels. Rising property taxes are an enormous community concern, and one that is inextricably linked to the conversion of undeveloped land to residential uses. Due to a lack of good data, it is unclear how much of the total forested land area has already been converted to residential or commercial use and this lack of quantification of land-use changes is of concern to residents. The past forecast of an increased rate of development in Shutesbury is cause for concern, because nearby towns with rapid growth rates, such as Belchertown, have witnessed environmental problems associated with development and land-use changes. Potential environmental problems include: increased erosion, siltation and runoff due to an increase in the amount of cleared land and the construction of additional driveways and roads on the many steep slopes that are present throughout town; and the clustering of additional septic systems in areas of town that are not restricted from development and have adequate soils.

Erosion and siltation cause destruction of aquatic habitat in lakes, ponds and vernal pools, and affect spawning habitat in streams. Siltation is not yet noticeable in areas within Lake Wyola, with the possible exception of the deposition of a sand and gravel bar at the inlet to the lake at the point where Fiske Brook enters Lake Wyola. However, DCR's 2007 study suggests that siltation in Lake Wyola could become a problem in the future, if recommended grading and erosion control measures are not implemented. In addition, erosion along streambanks removes overhanging vegetation, which removes cover for fish, raises the water temperature and decreases oxygen levels. This can result in changes to the species compositon of streams, most notably the loss of cold-water fisheries. Although necessary repairs to the Lake Wyola dam have been completed, ongoing inspections and maintenance will likely be required to ensure that potential washouts and flooding of downstream riparian habitats are prevented. In addition, the rigorous use of adequate erosion controls and efforts to rapidly stabilize

areas of bare soils with permanent vegetative cover will help to control erosion and curb colonization of cleared areas by invasive species. Furthermore, careful construction of drainage systems for new roads and adequate and frequent maintenance of road surfaces and drainage systems will help to minimize the potential adverse impacts of storm-water runoff and erosion. Fortunately, more recent population growth trends for Shutesbury indicate that, at least for the short-term, development pressures in town, and associated environmental problems will be minimal. However, due to the erodability of the soils on steep slopes, the large number of dirt roads in town that are in need of frequent maintenance, and the presence of ongoing logging operations, keeping erosion and siltation in check is an ongoing and necessary activity that is independent of the rates of growth or development in town.

Because Shutesbury does not have the thick stratified drift deposits and substantial re-charge areas that are found in towns located on the floor of the Connecticut Valley and does not lie in a flat area near a major river where it would be feasible to construct a traditional community wastewater treatment system, Shutesbury will likely have to rely mainly on individual or small community water supply wells in bedrock for its water supply and on individual septic sytems to serve the wastewater treatment needs of its residents, although small community septic systems and public water supply wells serving a small portion of the community may be feasible in some areas of town. As explained previously, most of Shutesbury's soils are less than ideal for septic system construction, due to low permeability rates, a high-groundwater table, shallow depths to bedrock and/or the presence of an impermeable fragipan layer. The thin veneer of soils in many places means that there is potentially less thickness of soil available that could serve as a filtering buffer for removing contaminants (i.e., road salts, fertilizers, pesticides, hazardous wastes, septic system effluent, etc.) before surface runoff or infiltration brings these materials into potential contact with surface water or groundwater. Yet the entire town is serviced by individual septic systems, including either soil absorption fields or tight tanks. This is especially a concern relative to the shallow wells and septic systems located adjacent to Lake Wyola and the potential contamination of drinking water supplies within the deeper bedrock aquifer. Unfortunately, the degree of connection between groundwater in the overburden and the underlying bedrock at any particular drinking water well location is poorly understood, at present, because little is known about the abundance, interconnectivity and orientation of bedrock fractures. In some cases, contamination in one well could originate from a source on the same property located very close to the well, whereas on another property, groundwater contamination could originate at a source area farther removed from that property. Due to the uncertainty of the relationship between groundwater in the overburden and bedrock, the most prudent approach is to make sure that septic systems are designed properly (in accordance with the Title 5 Regulations), extra care is taken to prevent or minimize the use of any contaminants that could potentially make their way into groundwater or surface water, and development in surrounding watershed areas is closely monitored. Developing and implementing a program to educate Shutesbury residents about proper septic system maintenance and the proper use, management and disposal of pesticides, herbicides and household hazardous wastes could go a long way in protecting the fragile bedrock aquifer.

Invasive plants constitute another potential environmental concern for Shutesbury. The Massachusetts Invasive Plant Advisory Group (2005) has developed a list of 66 plant species that it has classified as being either invasive, likely invasive or potentially invasive. The list includes a number of trees, shrubs and herbaceous plants that were previously not considered to be invasive and are either known to grow in the wild or have been previously used as landscaping plants, such as: Norway maple, sycamore maple, black locust, multiflora rose, Japanese barberry, winged euonymous, autumn olive, common buckthorn, various honeysuckle species, oriental bittersweet, garlic mustard, dame's rocket, coltsfoot and yellow iris. The Massachusetts Department of Agricultural Resources has placed importation bans and propagation bans on these invasive species. Invasive species typically have one or more adaptations that allow them to out-compete native species. These are: extensive and resilient root systems, the ability to produce large numbers of stress-tolerant seeds that may remain viable for long periods of time, the ability to disperse over spatial gaps, fast growth rates, etc. Although it is prudent to be aware of the spread of any invasive species, particularly in newly-cleared areas, wetland areas tend to be the most susceptible to takeover by invasive species such as purple loosestrife, phragmites, reed canary-grass, Japanese knotweed, water-chestnut, variable water-milfoil, Eurasian water-milfoil, and curly pondweed. The best way to control potential impacts to wetlands is to monitor these areas for invasive growth (as is already being done in Lake Wyola) and conduct ongoing maintenance programs to periodically remove invasive species (such as town volunteers have been doing to control Japanese Knotweed). Although invasives are not currently a problem in the riparian corridor along the Sawmill River in Shutesbury, they are a problem downstream in neighboring communities. Therefore, it may only be a matter of time before invasive riparian plants migrate upstream. Plans for projects proposing to clear vegetation from riverbanks or alter or replicate bordering vegetated wetlands should contain provisions for rapidly reestablishing temporary vegetative cover, actively planting and seeding altered areas with native species, and monitoring and controlling invasive growth until native species can become reestablished.

Because Shutesbury has such extensive forest cover, another growing environmental concern is the recent invasion of forests in the Northeast by three insect pests: the hemlock wooly adelgid, the European gypsy moth, and the Asian longhorned beetle. The hemlock wooly adelgid is an aphid relative that attacks Eastern hemlocks by withdrawing sap and damaging the plant's vascular system. This pest produces two generations per year, one of which actively feeds in winter when predatory insects are absent. Plants growing in stressful sites (i.e., those with ledgy soils, poor drainage or droughty conditions) usually succumb within 3 to 5 years of invasion, with healthier plants lasting up to 7 to 10 years. Mortalities of up to 90% have been observed. There are no commercially available biological agents and treating forest stands with horticultural oils is difficult. Shutesbury contains a number of hemlock forests that provide habitat for a number of species of birds and mammals. In addition, hemlock forests along trout streams provide necessary shade to keep the waters cool. Hemlock wooly adelgids have already been reported in Shutesbury, but their numbers are growing slowly at the present time.

The European gypsy moth is the major introduced pest of the eastern United States hardwood forests and the first outbreak of the European gypsy moth occurred in Massachusetts in 1889. The European gypsy moth prefers species of oak, but will attack up to 600 different species of deciduous and evergreen trees and shrubs, including: maples, elms, birches, poplars, willows, aspens, cherries, alders, apples, hawthornes, basswood, cottonwood, pines, hemlocks, and spruces. The European gypsy moth dislikes and avoids ashes, sycamore, rhododendrons, mountain laurel, cedars, black walnut, balsam fir and flowering dogwood, but will eat almost anything during an outbreak when competition is fierce. Females lay from 100 to 1,500 eggs per egg mass in July that hatch into larvae in April and May when hardwood trees are beginning to bud. During an outbreak, up to 1,000 egg masses may be present per hectare. Newly-hatched larvae attached to silken threads can be carried by the wind for distances of up to 1 mile. Until pupating in mid-June to early July, larvae eat the tree's leaves, mostly during the night, except during the height of outbreaks when leaf-eating occurs during the day, as well. Healthy trees can survive a single defoliation, but weak or stressed trees cannot. However, repeated defoliations during cyclical outbreaks can stress and kill trees. In oak-dominated stands, outbreaks last from 2 to 5 years, with moth populations remaining low for the next 4 to 12 years. Stands of trees containing more than 50% oak (as opposed to oak-pine or mixed hardwood stands), particularly those growing on dry rock ridges, have the highest mortality rates. Furthermore, pines and hemlocks are more likely to be killed by an outbreak than hardwoods, with a complete defoliation killing up to 50% of the pines and 90% of the hemlocks. Pesticides may be used to control outbreaks, but these are usually toxic to other moths and butterflies, bees and some gypsy moth parasites. Fortunately, gypsy moths do have a number of natural predators, including a number of insects, birds, small mammals, bacteria, fungi and viruses that can help to keep outbreaks in check. In addition, periods of very low winter temperatures can kill the eggs, alternating freezing and thawing cycles in late winter can prevent hatching, and rainy weather can inhibit the dispersal and feeding of larvae.

Until recently, infestations of the Asian longhorned beetle were present only in southern New York, New Jersey and Illinois. However, in August 2008, the Asian longhorned beetle was first discovered in nearby Worcester and the current outbreak there is one of the largest outbreaks ever observed in the nation by the U.S. Forest Service. This beetle prefers various species of maples, including sugar maple, red maple, silver maple, Norway maple and box elder. However, it will also attack various species of willow, elm, birch, poplar, ash and horse chestnut. Asian longhorned beetles lay between 35 and 90 eggs which hatch into larvae that bore deeply into trees. The larvae feed on the vascular system during the fall and winter and eventually girdle the tree, thereby preventing the flow of food and water within the tree and resulting in death. There are no known natural predators in the U.S., and since the larvae spend most of their time in deep burrows, infestations are difficult to control. Although labor-intensive in their application, insecticides can be effective if injected into the soil or the trunks, but only if this is done prior to the outbreak of an infestation. The larvae can be readily transported from one region to another in lumber and firewood and the only assured control method is to cut, chip and burn infested trees and replace them with non-host species. The U.S. Department of Agriculture's Animal and Plant Health Inspection Ser-

vice has stated that the Asian longhorned beetle has the potential to cause more damage than Dutch Elm disease, chestnut blight and gypsy moths combined. Potential impacts in the Northeast are to the maple syrup, lumber, tourism and nursery industries. In Shutesbury, an infestation of this beetle could impact ongoing lumber harvesting operations, drastically change the composition of the forest community and destroy large blocks of deciduous forest that currently serve as wildlife habitat, support recreational uses and preserve the prized rural character of the area.

With the vast tracts of highly-valued, forested land present in Shutesbury, outbreaks involving one or more of these insect pests could be devastating. With this concern in mind, it may be useful for the town to make efforts to educate town boards, large landowners who may not already be familiar with these insect pests and recreational users of the forests to look for and report back on warning signs of potential outbreaks. In addition, prior to making decisions to purchase particular tracts of forested land that are considered valuable for open space protection purposes, inspecting the land for the presence of such pests may be prudent to determine if eradication methods are feasible or if limited funds might be better spent on other non-impacted tracts of land that provide comparable habitat, or aesthetic or recreational value. If Shutesbury is interested in maintaining the character and integrity of its many forests, for scenic value, bioligical diversity, recreational activities, etc., it is essential that pests that could cause widespread devastation be observed in time and managed, if not eradicated.

The final environmental concerns for Shutesbury are focusing land acquisition efforts to preserve diverse habitat for state-listed rare species and protect exemplary communities and BioMap2 and Living Waters Core Habitats, and preventing alterations to these habitat areas. Vernal pools and the surrounding hardwood or coniferous forests provide essential habitat for several state-listed rare amphibians. Even in the absence of direct alterations, these pools can be impacted by siltation and runoff containing road salts. The New England Bluet and the spatterdock darner require wetlands containing open water and submerged, emergent and floating vegetation, as well as fields and forests located near the wetlands in order to complete their life cycles. Water drawdowns, wetland filling, sewage and runoff, the operation of off-road vehicles along pond shores and the wash from motorboat wakes can all adversely affect these rare insects. Runoff containing fertilizers and nutrients from septic systems into water bodies such as Lake Wyola can adversely impact bridle shiner habitat by causing too much weed growth, decreasing oxygen levels and causing turbidity. Bridle shiners capture their prey using their eyesight and prefer clear water with patches of moderate to high cover from submerged aquatic vegetation. Bridle shiners are also poor swimmers that can be impacted by flow alterations, such as lake drawdowns. In addition, other species have very specific habitat requirements that make protection of these unique habitats a priority. For example, the grasshopper sparrow nests on the ground in open fields, the water shrew inhabits bank-side burrows in rocky-bedded streams in heavily-forested areas, and the wood turtle, the box turtle and the southern bog lemming require a combination of wetland areas, fields and forests to provide their annual habitat needs. Therefore, land protection efforts in Shutesbury should focus on the preservation of both unique habitats and habitat diversity to preserve our state-listed rare species.

SECTION 5: INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

A. INTRODUCTION

This section is an inventory of lands that are important to the town due to their current and possible future open space and/or recreational uses. Both private and publicly-owned sites are included. The detailed list of properties is included in Appendix E. Continuing current uses of private land are not guaranteed, unless there is consent of the property owner in the short term, and a deed restriction for the long term. Protected open space provides aesthetic amenities, maintains the town's rural character and quality of life, and helps protect the town's natural resources, including clean air and water, wetlands, large blocks of forestland, and wildlife habitat. Shutesbury serves an important role in the protection of public water supply, having portions of three public surface water supply watersheds in town: Quabbin, Atkins, and Amethyst Brook (Hawley/Hill intake). This makes the protection of these areas important on a regional scale, since they are all used by people well beyond the town's borders.

Survey results (Appendix D) indicate a strong preference for maintaining the town's rural characteristics, with an emphasis on passive recreation, such as hiking and cross-country skiing. It is, therefore, important that currently-protected lands be maintained and opportunities for additional protection be sought for lands viewed by the town as critical in linking or augmenting lands already protected for recreation and open space.

As the town considers management of existing conservation and recreation lands, or acquisition of new ones, consideration should be made of how to make some sites more accessible for persons with disabilities. Options could include creating a trail for chemically-sensitive people in the woodland behind the Town Hall, or wheelchair access across the open conservation area off Merrill Drive to provide access to the shoreline for fishing or viewing the inlet and island. Evaluations of ADA access for persons with disabilities for all town recreation and conservation areas are included in Appendix F.

During the period from 2008 to 2009, Shutesbury adopted two major pieces of legislation pertaining to land use that also impact open space land preservation. The first is the Open Space Design provision of the Shutesbury Zoning Bylaw. This ordinance created four districts in town – the Forest Conservation District (FC), the Lake Wyola District (LW), the Roadside Residential District (RR) and the Town Center District (TC) as depicted on Map 3. As stated at the beginning of the Open Space Design Section of the Shutesbury Zoning Bylaw, "*The primary purpose of this Section is to preserve the open space resources of Shutesbury as identified in the Master Plan, especially large contiguous blocks of forested backland that must be maintained as large-acreage holdings in order to remain economically viable for commercial forestry. This is necessary for the continuation of forestry as a significant resource-based local agricultural activity and for the protection of the town's water resources and other unique environ-*

mental assets." An important provision of this bylaw relates to the acreage necessary for a residential development and the obligations of a multi-unit development to reserve land to be protected, in perpetuity, under a CR. Plans for development must include a minimum of 80% of the property's acreage as protected open space in the FC, and a minimum of 65% as protected open space in the other three districts. This creates more permanently-protected open space (although not necessarily open to the public for use), and helps preserve the larger blocks of contiguous forest for wildlife, watershed protection and other environmental benefits. The second important action was the town's enactment of the CPA in 2008, offering a new funding opportunity for town acquisition of important open space and recreation lands. The town voted to adopt a real estate tax surcharge of 1.5%, with a certain percentage of matching funds provided from an "off-budget" account administered by the state. The revenues from the CPA account can be used for only three purposes: open space and recreation, historic preservation, and community housing. During 2009, the new town CPA Committee began work to administer the CPA in town. The CPA funds will be a valuable additional source of funding for open space and recreation land acquisition and improvement of recreational facilities.

This inventory is divided into two categories based on DCS' definitions of protected and unprotected lands. Protected lands are public or semi-public parcels which are permanently protected for conservation purposes, or private lands that have been permanently protected with a CR, Watershed Restriction (WR) or APR. The unprotected lands category consists of town-owned lands not presently committed to conservation purposes, and private lands that have value for open space and/or recreation purposes, such as passive recreational land, watershed lands, and land important to wildlife habitat.

B. PROTECTED OR TEMPORARILY-PROTECTED PARCELS

Public Lands

A large percentage of the town is owned by public agencies for conservation, recreation or watershed protection purposes, with most of it permanently protected from development (Map 7). DCR owns 35% (6,183 acres) of the land and water in Shutesbury, with 827 acres of that state land ownership associated with the Carroll A. Holmes Recreation Area/Lake Wyola State Park, the Great Pond portion of Lake Wyola and Shutesbury State Forest. The rest of the DCR land is protected as a public surface water supply and adjacent watershed for the Quabbin Reservoir. The state park, state forest and Lake Wyola are open to the public. The state park charges for parking and provides a beach, a fishing area that is accessible to persons with disabilities, a few picnic areas and a walking trail. The Great Pond is the central part of Lake Wyola and is used primarily for boating and fishing, with access from private docks or the public boat ramp on town conservation land off Randall Road. The Quabbin watershed lands have restrictions on access and types of use. Walking or hiking is allowed in most of the area, but biking, skiing, swimming, fishing from land and camping are not.

The Shutesbury and Amherst Conservation Commissions both manage conservation lands for their respective towns in Shutesbury. These lands are permanently protected and open to the public for passive recreation. The Shutesbury Conservation Commission has management over seven conservation areas (135 acres), as well as most of Lake Wyola around the Great Pond, for a total of 387 acres. The lake area is accessed by many people from private docks and beaches that dot the shoreline. The former town beach, next to the public boat ramp, was discontinued many years ago and is now grassed over, with people using the state park beach instead. In 2014, the Library established a Canoe & Kayak Loan Program, with boats stored at the former beach. Most of the conservation properties are small, except for the Lake Wyola Conservation Area (with former beach and boat ramp) and South Brook, which abuts it, located on the western side of the lake. Both parcels were acquired with Self-Help funds, the boat ramp and beach area being the first to receive such grants in town. Together, the Lake Wyola Conservation Area and South Brook comprise a 97-acre area of lake and shoreline, wooded swamp, upland woods with eskers, and a network of trails. The South Brook parcel was acquired especially to help protect the Lake Wyola watershed and the rare fish in the lake. There are two small conservation areas on the northern side of the lake. One of these is the 1.4-acre parcel off Cove Road, which was a gift from Anna Garbiel and is a nice picnic area on the water with a great view. Unfortunately, parking is a real problem in this tight spot. The other is the "Island" property off Merrill Drive. This 0.6-acre parcel was purchased by the town to allow additional public access to the lake shoreline. The area is mowed grass with a bench and view of the island and inlet to the lake. There is a bit of a drop to the water, making it a little difficult for kayaks and canoes to launch here without some work. It has room for 1 to 2 cars to park off the road. The 3-acre Montague Road parcel was acquired through tax title, as was the Mt. Mineral Road 1.7-acre parcel. The Montague Road parcel includes part of a lovely bog and wooded wetland, with the upland area being mostly forested, with a mountain laurel understory. There are presently no trails or picnic areas created on the parcel. The Mt. Mineral Road parcel is landlocked and its boundaries are not identified with iron pins or other markers, so it is difficult to find. The last conservation area is "Haskins Meadow," which was a joint Self-Help project with Leverett and Amherst. This area is located between East Leverett Road in Amherst and January Hills Road in Shutesbury. With the addition of a gift of an adjacent wooded wetland by Doug Kohl, the Shutesbury portion is 31 acres. Much of this area is field and meadow that is now transitioning into brushland. There is a nice small stream flowing through the Shutesbury property. The Amherst Conservation Commission has an agreement with Shutesbury for mowing a path through the meadow for walkers.

Shutesbury is one of a few communities in the state that has conservation land owned by another town within its borders. The Amherst Conservation Commission manages two conservation areas with a total of 255 acres. They are both located in the Atkins Reservoir watershed. The Gage property off Sand Hill Road has a trail loop. The Houston property off West Pelham Road does not have an obvious access point or trail at this time. The Shutesbury and Amherst conservation lands together total 642 acres or 3.7% of Shutesbury's land.

The Amherst Water Department also manages land for the town of Amherst in Shutesbury, for the Atkins Reservoir public water supply and adjoining watershed. The 514 acres managed by the Amherst Water Department appear to have only limited protection from development, based on the text of the deeds that have been found so far. This land is obviously important for the towns of Shutesbury and Amherst in terms of future use of the reservoir, and the impact on the town if it were to be sold off for development at some point. The Amherst Water Department's policy is that the land and reservoir are not open to the public, although part of Amherst's Robert Frost Trail and a trail that was formerly part of the long distance M&M Trail pass through the watershed properties in this corner of Shutesbury. The reservoir area is well posted for no trespassing, as is some of the other watershed land.

Private Lands

There are a number of private properties in town that are permanently protected through a deed restriction or easement on the property. These restrictions are usually purchased by a state agency or private land trust, and may be for preservation of agricultural lands and activities, watershed protection, or for conservation purposes. Easements tend to be for access, such as for trails across a property. Restrictions allow private owners to continue to own their property, while preserving important open space for the residents of the town, region and state. The restrictions decrease property taxes and provide an income tax credit, and when purchased by a third party, provide funds to maintain and improve the properties. Legal recording of a restriction or easement binds both current and future landowners. Most of the restricted land in town is not open for public access, but some restricted lands are open with permission of the owner.

In December 2011, a very large land protection deal was completed in Leverett and Shutesbury between the landowner, W. D. Cowls Inc., and the Kestrel Land Trust, Franklin Land Trust, and Massachusetts DFG. The project, protecting a 5.4 square mile area known as Brushy Mountain, is the largest CR on private land in the Commonwealth's history. The cost of $8.8 million was funded through several large grants, including a $5 million federal Forest Legacy Grant. A total of 3,486 acres, of which 600 acres are in Shutesbury, are protected for Biodiversity Resource Protection, with public access for passive recreation allowed along the many trails and old woods roads that cross the property. Specific reasons stated for why this property was so important to protect included: it is a large block of unfragmented interior forest (that directly abuts 630 acres of permanently-protected open space); it has a high "Ecological Integrity" score from UMASS Amherst's Conservation Assessment and Prioritization System (CAPS) Program; it is documented habitat for three wide-ranging mammals (moose, bobcat and black bear) that need large areas to survive; it is important habitat for interior forest birds; 69% of the project area is mapped by the NHESP as BioMap 2 Core Habitat and almost all the rest as Critical Natural Landscape; it is important for climate change adaptation, protection of public water supply and fisheries; and it was a high conservation priority for local, regional, state and national groups. It also has high scenic landscape value, and is on the state's list of "1,000 Great Places in Massachusetts". The land is forested, and sustainable forest management is still per-

mitted. DFG is the holder of the CR. The forest has been named the Paul C. Jones Working Forest, in honor of the company's recently-deceased family leader. The CR guarantees public access for passive recreation, including hunting, fishing, hiking, skiing, and wildlife observation. No motorized vehicles, except snowmobiles and those used for forestry practices, are allowed. The trail network has three parking access areas in Shutesbury.

There is one APR in Shutesbury, for the Poverty Mountain Farm, LLC in the southwestern corner of town. The Massachusetts Department of Agriculture holds the restriction, which means it has a right to monitor the property to see that it remains in agricultural use. The APR protects the largest piece of agricultural land (34 acres) in town and the farm is part of an important large agricultural block at the corner of Shutesbury, Amherst and Pelham. Some of this same property also has a permanent conservation easement with DCR for a portion of the M&M trail that runs through the woodland. There are seven landowners with CRs on 13 parcels. Three of the property owners have CRs with DCR, for a total of 576 acres. One has a CR for a 7-acre parcel held by the Conservation Commission and The Kestrel Trust, a local land trust. Another has a CR for a 28-acre parcel held by just the Conservation Commission. Only CRs approved by the state are permanent. The largest CR is for Brushy Mountain, as described above, totaling 600 acres in town. One landowner has a Watershed Preservation Restriction with DCR for 18 acres surrounded by DCR-owned Quabbin watershed land. The Connecticut River Watershed Council (CRWC), a local non-profit conservation group, owns 1.6 acres of land on the border with Wendell. Altogether, these private properties with restrictions equal 682 acres, with only the trail easement being open to the public. The CRWC land is located along a public way (Jennison Road) and may be open to the public, but it is small, partially wet, and does not have a sign letting people know where the property is and its boundaries are.

A large percentage of the town land is in "temporary" protection under the Chapter 61 (forestry), 61A (agriculture) and 61B (recreation) special taxation programs. These lands are privately owned and may be sold for private development purposes and/or taken out of Chapter 61 taxation status, but the Chapter 61 tax classification laws require that the owner give notice to the town if the property is being sold, and the town has the right of first refusal to purchase the property at fair market value. Additional details concerning Chapter 61 legislation and provisions can be found in Appendix A.

A total of 6,136 acres or 35% of the town's land is in these three programs, with the vast majority (31% of the town's land) in Chapter 61 for forestry management. This figure includes 600 acres of the Brushy Mountain CR, which remains in Chapter 61. A large proportion of the Atkins and Amethyst Reservoir watersheds are in private ownership under Chapter 61. Public access is not required under any of the Chapter 61 programs. Use by the public is at the property owner's discretion. Some of the private forest land has woods roads and trails used informally by the public throughout the year. A local snowmobile club has permission to include on its trail maps many trails on property belonging to the major Chapter 61 forest landowner, and the club's signs can be seen along some of the trails. Shutesbury is part of a regional snowmobile trail system and

has a series of trails that cross through town. During winters such as 2015, with heavy snowfall, the snowmobile trails offer skiers, snowshoers and wildlife easier access through the woods. Unfortunately, the ATV users, who follow these trails on public and private property in the mud season, create deep ruts and erosion that damage the trails, cause sedimentation into adjacent wetlands and waterways, and make the trails more difficult for casual walkers, runners and mountain bikers to use.

Most of the top 1% largest blocks of contiguous interior forest blocks in the state and the BioMap2 Core Habitat lands in Shutesbury are now protected after the Brushy Mountain CR was completed. There is still a good amount of the top 10% largest blocks of contiguous interior forest blocks and the BioMap2 Critical Natural Landscape lands still unprotected, much of it in Chapter 61. It is important that the town, through the Conservation Commission and Open Space Committee, identify and monitor lands that are important for conservation and recreation purposes, and develop options for acquiring these lands or otherwise protecting these remaining important lands.

Table 2 summarizes the permanently-protected land, land with limited protection and temporarily-protected land in Shutesbury. Acreages in this table have been rounded off and parcel sizes are expressed in both acreage and percentage of the total land area of Shutesbury. The tables in Appendix E contain the more-detailed listing of properties.

Table 2. Summary of Shutesbury Lands with Permanent, Limited or Temporary Protection

A. Publicly-owned, Permanently-protected Lands	
MA DCR, Division of Water Supply, Quabbin Watershed	5,356 acres (31%)
MA DCR, State Parks & Forest	827 acres (4.7%)
Town of Shutesbury Conservation Lands	387 acres (2%)
Town of Amherst Conservation Lands	255 acres (1.5%)
Total Publicly-owned, Permanently-protected Open Space	**6,825 acres (39%)**
B. Privately-owned, Permanently-protected Lands	
Non-Profit (CT River Watershed Council)	2 acres (0.01%)
Agricultural Preservation Restriction (APR)	34 acres (0.2%)

Table 2. Summary of Shutesbury Lands with Permanent, Limited or Temporary Protection (Continued)	
B. Privately-owned, Permanently-protected Lands (cont.)	
Conservation Restrictions (CR)	1,212 acres (7%) (includes 600 acres for Brushy Mt.)
Watershed Preservation Restriction (WR)	18 acres (0.1%)
Conservation Easement on Recreational Trail	est. at 17 acres (0.1%)
Total Privately-owned, Permanently-protected Open Space	**1,283 acres (7%)**
C. Publicly & Privately-owned Lands with Limited Protection	
Shutesbury Cemeteries & Town Common	9.8 acres (0.06%)
Town of Amherst Water Supply	514 acres (3%)
Private Cemetery (JCA)	2.2 acres (0.01%)
Total Public & Private Limited-Protection Open Space	**526 acres (3%)**
D. Privately-owned, Temporarily-protected Lands	
Chapter 61 (Forestry)	5,366 acres (31%) (includes 600 acres for Brushy Mt.)
Chapter 61A (Agriculture)	101 acres (0.6%)
Chapter 61B (Recreation)	650 acres (3.7%)
Total Privately-owned, Temporarily-protected Open Space	**6,117 acres* (35%)**

Table 2. Summary of Shutesbury Lands with Permanent, Limited or Temporary Protection (Continued)	
Total Acreage of Shutesbury (Land and Water)	**17,408 acres**
Total of Permanently-protected Open Space and Open Space with Limited Protection	**8,634 acres (50%)**
Total Open Space Land in Shutesbury with Either Permanent, Limited or Temporary Protection	**14,151 acres* (81%)**

*Because Brushy Mountain land is protected under both a Conservation Restriction and Chapter 61, the 600 acres for Brushy Mountain were counted only once in this total.

Shutesbury is fortunate to have 81% of its land currently protected from development. However, since 32% of Shutesbury's land is only temporarily-protected under the Chapter 61, 61A or 61B programs, the town needs to have a process in place for timely response when Chapter 61 properties come out of the program, to ensure that the town's first right of refusal can be exercised when prime parcels are put up for sale.

C. UNPROTECTED PARCELS

The town of Shutesbury owns approximately 500 acres of land, of which 406 acres are protected as conservation land, or have at least limited protection based on use and historical reasons, such as the cemeteries and the Town Common. Some of the other town-owned land is important for historical reasons, some sites are actively used for recreation and could be improved upon, and some areas are important for conservation purposes and should be protected as such. The following section of text and Table E-5 in Appendix E list the town-owned properties of conservation and recreation interest that are not currently protected. For all properties, Table E-5 provides additional detail on lot numbers and the relative recreational and conservation merits of each of these parcels, so that they may be prioritized for protection via CRs and/or future acquisition. Recreational access by disabled residents would be particularly feasible for the parcels listed under items 3, 4 and 5 (below). Stone dust could be used to develop trails, rather than constructing concrete pathways. We recommend that the town designate the high-conservation-interest properties as protected land under Conservation Commission management.

Town-owned Lands

1. Field behind the Fire Station (2 acres). This area is occasionally used for soccer, football, general play, baseball/softball, and also for town's July 4 bonfires. It has an

old horse paddock in back that was formerly used by 4H club members for horse events. Four ground-mounted solar panels have been installed on the edge of the field, but are not in the way of other activities on the site.

2. Field behind Town Hall **(**3 acres). This area is used for general play and picnicking. A part of this area has been used for the installation of four ground-mounted solar panels, but most of the field remains open and is used occasionally for town events.

3. Woodland behind Town Hall (9 acres). This land connects to Quabbin watershed land on the southern side, and could provide a pleasant walking/cross-country skiing trail behind Town Hall. An advantage is that ample parking is already available.

4. Elementary School playing areas and woods (estimated at 9 acres). This area is available for baseball/softball, basketball, cross country skiing, football, soccer, general play, nature observing, and walking/jogging. Some of this area outside the school building is composed of swing sets and playground equipment (the only public playground in town); minimally-improved fields that are used for school recess and sports; a paved parking area that is used for basketball, hopscotch and child bicycling and woods that contain limited trails.

5. Woodland in back of former Lewis Taylor homestead (estimated at 14 acres). The front part of this property was proposed to be the site of the new town library, but the proposal failed to pass the debt override election in 2012. The larger back area is wooded, with some wetland. This area would be nice for walking trails that could also be used for cross-country skiing and snowshoeing.

6. Wooded lot off Pelham Hill Road (3 acres). This area is owned by the University of Massachusetts and is the location of a former radio tower site. It abuts the woodland in back of the former Lewis Taylor Property and would allow for the creation of an extended trail across the two properties.

7. Wooded lot off Montague Road (16.5 acres). This lot would significantly increase the value of the adjacent 3-acre conservation area on Montague Road at Brown's Pond (a.k.a. Dudleyville Marsh). It contains part of a lovely bog and wooded wetland, and has an old trail across the property.

8. Three small wooded lots near Lake Wyola (0.3 acres). This area provides refuge for birds, small wildlife and a visual and sound buffer for people in this densely-developed residential area. It also provides some opportunity for groundwater recharge to the lake.

9. Three adjacent wooded lots off Wendell Road (3.6 acres). This area adds to a large block of permanently-protected land near Lake Wyola. It appears to be too steep, rocky and wet to develop.

10. Two adjacent wooded lots off New Boston Road (14 acres). These parcels are embedded within state protected land, but next to a private forestry parcel. The site has high conservation value, but its steepness and remoteness limit recreational use.

11. Wooded Lot off Wendell Road (8 acres). This lot is behind a housing development, but next to DCR-protected land and a large interior forest block. Recreational use is difficult since there is not an established easement for access past the houses.

12. Wooded Lot off Briggs Road (2 acres). This lot is surrounded by DCR state forest and watershed. It has high conservation value, but its steepness and remoteness limit recreational use.

Private Lands or Lands Owned by Non-profit Groups

The following text and Table E-5 list properties in town that are or could be of conservation or recreation value and are owned by private or non-profit owners. While these private and non-profit properties are of conservation or recreation value, they would not necessarily be high priorities for acquisition, because they would require staffing and management that the town could not provide.

13. Shutesbury Athletic Club (3 acres). Although privately-owned, it is worth noting that this site has value as a place for meetings and events by various community groups. The property is centrally-located in town and has an outdoor picnic area suitable for barbecues which might even bring in revenue for assorted town groups. The Garden Club, for example, holds its meetings and plant sales at the club, and the Library has held dinners there, as well.

14. Lake Wyola Association Building (1 acre) and beaches. The Lake Wyola Association Building is a meeting hall used in summertime for many Association events which are open to the public, such as steak roasts, beer fests, movies, and the famous 5K road race. Three small private beaches on the shoreline of Lake Wyola are used by Association members for swimming, picnicking, and canoe/kayak access.

15. Pine Brook Camp and Conference Center (Camp Anderson Foundation) (37.5+ acres). This area is located on the northern side of Lake Wyola and abuts Lake Wyola State Park. These undeveloped parcels are part of a Christian camp started in 1930s. Other parcels include camp buildings. The total acreage of the camp is 120 acres in Shutesbury and Wendell.

16. Morse Hill Outdoor Education Center (51.5 acres). This area consists of largely-undeveloped, wooded parcels with an outdoor education theme, including rope courses in tall pines and camping. The parcel's northern boundary abuts the Sawmill River and the parcel is part of the Lake Wyola watershed. This area adds to the outdoor recreation options in the Lake Wyola area.

17. Robert Frost Trail. This is a regional hiking trail originating in Amherst that traverses the southwestern corner of town. It passes through private property, with permission of the landowner, and Amherst watershed land near Atkins Reservoir.

18. Metacomet-Monadnock (M&M) Trail. This is a long-distance, interstate hiking trail that traverses southwestern corner of town. It passes across private property and Amherst watershed land, with permission of the landowners.

19. New England National Scenic Trail (NENST). The New England National Scenic Trail was designated in 2009. It generally follows the M&M trail through Massachusetts. It extends from Long Island Sound in Connecticut to the Massachusetts/New Hampshire border. The trail was rerouted in the Shutesbury area because of private landowner concerns. The new route in Shutesbury (Sections 12-15) comes up the eastern side of town, on land owned by DCR and other willing landowners. Although the route has been determined, not all of it has been cleared and blazed yet.

SECTION 6: COMMUNITY VISION

A. DESCRIPTION OF PROCESS

The Open Space and Recreation Committee began holding occasional public meetings in 2005 to generate interest and gather input on what the town's needs and desires were for open space and recreation, and attract residents to work on the plan update. In 2006 an Open Space and Recreation Survey was sent to all households and many property owners as an insertion in the town newsletter. The compiled results were considered during the update process. In addition, other recently-produced town planning documents and community discussions informed the members as well. These items included the Master Plan (completed in 2004, after a lengthy public review process) and survey; the 2005 Zoning Survey sent out and results compiled by the Planning Board; the lengthy public hearing and meeting process for the "Open Space Design" zoning bylaw changes approved at Town Meeting in Spring 2008; and the discussions and meetings regarding adoption of the CPA, which was approved by Town Meeting votes in 2008.

The Open Space Committee was re-formed in 2007 after a split from the Recreation Committee, so each could pursue its priorities. Meetings have been held the third Thursday of the month since then, posted and open to the public. In April 2008, the Committee held a Public Informational Forum to provide the public with an update on their progress and the opportunity to ask questions. In September 2008, the Committee met with the Historical Commission to discuss conducting a Heritage Landscape Inventory in town, and potential sites to consider in the inventory. In March 2009, the Committee met with several representatives of two local land trusts and the Conservation and Open Space Planner for the largest private landowner in town, a local lumber company, to discuss local and regional open space planning. The Committee members also met a couple of times a year with the Select Board for an update on their progress and items of interest. After a complete draft was assembled, it was distributed widely to interested town boards and committees, residents and property owners, public agencies and private, non-profit land trusts in the area. Comments were considered in the revised draft, and the revised draft was made available during a second public comment period. The plan was again revised, based on public comments, before submittal to the Department of Conservation Services for its approval.

B. STATEMENT OF OPEN SPACE AND RECREATION GOALS

The overriding physical characteristic of Shutesbury is the abundance of forestland. It helps to maintain the rural character, peace and quiet, clean air and water, wildlife habitat and rural lifestyle that caused most of the residents to settle here. Other people come from elsewhere in the region to enjoy this environment at the Carroll A. Holmes State Park and beach, Quabbin Reservoir, Lake Wyola, and private centers such as Temenos, the Sirius Community, Pine Brook Camp & Conference Center and the Morse Hill Outdoor Education Center, and to use the wooded trails for regional hiking and

snowmobiling. While we are fortunate that a large percentage of the town is permanently-protected land, we need to identify other areas that are important to protect for the amenities listed above, and for other recreation. Residents want more recreational opportunities for themselves and their families in town, to limit the amount of time and gas used to drive to Amherst and beyond. A better ball field behind the school or fire station, a tennis court or winter skating rink, a community gathering place, a summer movie series, a better playground for young children, more locations for safe canoe/kayak access and use, better parking at trail heads, community gardens, and better communication about existing group activities are all ideas having supporters, but we need volunteers willing to step forward and form a recreation committee to work on them. General open space goals include protection of watershed lands and the town's water resources (including vernal pools and cold water fisheries); protection of large blocks of interior forest for biodiversity, rare species habitat, BioMap2 Core Habitats and Critical Natural Landscapes; and the addition of more protected land to existing conservation areas, river corridors and trail networks.

SECTION 7: ANALYSIS OF NEEDS

Despite the current leveling off of population growth in the Town of Shutesbury, there is still a strong emphasis on maintaining healthy, large-scale forested tracts, clean air and water, an aesthetic vision which relies on preservation of the "rural" character of the town and the possibility of unforeseen adverse threats requires continued vigilance on maintaining current conser-vation lands and healthy forested tracts, and encouragement of recreation which affords more opportunities for all generations in Shutesbury.

A. SUMMARY OF RESOURCE PROTECTION NEEDS

Only 6% of Shutesbury's land acreage is devoted to residential dwellings (with the highest density around Lake Wyola). A high level of increased population does not appear likely in the near term. However, any potential development of public transportation and the advent of wireless fiber optic cable Internet service would create incentives for more people choosing to live in Shutesbury. However, these incentives must be tempered by the general concurrence that there are limited building opportunities, due to the paucity of areas suitable for conventional septic systems. Another factor is well water. There are five small public water supplies in Shutesbury: the DCR C. A. Holmes Recreation Area, the Shutesbury Elementary School, the Sirius Community Center, the Pine Brook Camp & Conference Center and the Shutesbury Athletic Club. The Shutesbury Athletic Club serves the fewest customers (35) on a daily basis during its peak summer season and the Pine Brook Camp & Conference Center serves the most (450). Only the Sirius Community Center serves a population of year-round residents (30). However, the geologic features described in Section 4 appear to limit well water availability for large-scale use in most areas of town.

The Town of Shutesbury is currently 87% forested – a natural-resource characteristic which most residents consider its main visual and aesthetic attribute. Residents continue to show a strong interest in maintaining forestry resources and conserving land when opportunities develop. Important areas which require vigilance are oversight of invasive flora and fauna, the planting of non-indigenous species and the risk of disease to trees due to warming trends and the influx of several new insect pest species into Massachusetts. In addition, during the development of this plan, additional parcels have been identified as reverting to town ownership. Protection of certain parcels should be considered for areas contiguous to already-protected areas.

Increased summer activity, due to visitation to the state park, and a higher population of seasonal residents who live on the lake frontage could raise certain issues. Over the past decade, there has been a build-out of existing homes and the addition of floors to single-level structures, allowing for increased residents per dwelling. It is mandatory that such improvements comply with Massachusetts' Title 5 requirements for septic systems. With the increase in lakeshore residents and non-residents using the lake, there has been continued motorboat activity. No accidents have occurred, to date, although some swimmers and operators of non-motorized watercraft have expressed safety concerns periodically. Community dialogue involving the Lake Wyola Association and other town boards is important to maintain an understanding of the existing town

bylaw entitled *Bylaw Concerning Watercraft and Persons Using Lake Wyola.*

In addition, community dialogue is needed on the use of trails throughout the town. Based on survey results, there are varied views on what uses should be allowed on both town- and privately-owned lands – and some of these uses may be incompatible. A reasonable dialogue to allow the public to use town-owned and certain private trails (with the landowners' consent) should occur to maximize usage and promote respect for the landowners' willingness to allow public access.

B. SUMMARY OF COMMUNITY'S NEEDS

The Massachusetts Executive Office of Energy and the Environmental Affairs conducted a comprehensive survey of state recreational needs that is presented in the draft *Massachusetts Statewide Comprehensive Outdoor Recreation Plan* (SCORP), dated 2012. Many of the survey results reflect the sentiments of residents of towns in eastern Massachusetts, which have higher population levels, less access to the rural amenities found in Shutesbury and well-developed infrastructure for outdoor municipal recreation, including swimming pools, bike trails and multi-faceted community recreation complexes. As a result, the survey results presented in the SCORP reflect a need for more rural hiking and camping opportunities, including access to wildlife, and a desire for ponds or lakes providing both swimming and boating opportunities, with a strong emphasis on kayaking and canoeing.

In contrast, the rural, forested areas of Shutesbury, with numerous hiking trails and country roads for recreational cycling, and the presence of the Lake Wyola State Park, with its natural freshwater lake and water-based recreation, offer opportunities not found in eastern municipalities. Sentiments expressed by Shutesbury residents indicate a continued desire for hiking trails, cross-country skiing opportunities and water-based recreation at the state park. Needs expressed by Shutesbury residents in the 2006 Open Space and Recreation Survey conducted for this plan include infrastructure for a multi-use recreational facility that might accommodate basketball, volleyball, and tennis, and a community center for various types of gatherings, community interaction, and educational opportunities, including arts and crafts activities and seminars. These needs are not surprising, given the lack of any commercial activity within the town and the very limited capacity of the town's library. During the last few years, the vision of developing a new town library, which would serve as a multi-use community center with exterior trails for nature walks, has developed.

Other activities and efforts in the town often involve work conducted by numerous committees strictly on a voluntary basis. The "all volunteer" nature of this work has the positive effect of coalescing town residents toward a common cause but can, over time, result in a "burnout" effect, if additional residents are not part of the effort. With the leveling off of population growth in town, the options for finding new recruits to serve on volunteer committees diminish. The town's inability, for several years, to find any volunteers willing to staff a recreation committee, is an example of this problem.

In addition to a multi-faceted community center, there is a very strong interest in a multi-recreational-use area in the town for various sports including volleyball, baseball, soccer, equestrian training and football. The lack of a skating rink and tennis courts (among others) has resulted in the need for town residents to travel to Amherst for such activities, as well as for fitness activities available at a full-fledged fitness facility. As children move from the elementary school to the middle school and become involved in school sports, the required number of round-trip car journeys increases – providing an incentive for parents of middle school and high school students to move from Shutesbury to be closer to the Amherst schools.

The Farmer's Market in Shutesbury, which began in 2009, has been very successful in attracting town residents to a weekly, Saturday morning event in which local farmers sell their produce from the middle of spring until the middle of fall. The development of community gardens behind Town Hall would allow town residents to grow seasonal produce, in addition to purchasing produce from larger local agricultural farms.

The creation of the Shutesbury CPA Committee in 2010 has provided a framework for implementing the CPA, which was designed to provide funding for low-income housing, open space (with a portion for recreational uses), and historic preservation. To date, the CPA Committee has developed application procedures, project guidelines, and received and processed two historic preservation proposals that have passed Town Meeting votes, as well. The Committee expects that more proposals will be developed, as the procedural aspects of the CPA become more familiar town-wide.

C. MANAGEMENT NEEDS, POTENTIAL CHANGE OF USE

The town's volunteer network of committees, which conduct much of the work for which other municipalities employ town workers, has been cited previously. It is vital that this commitment continue. Given the current federal and state fiscal situations, limited aid for education, recreation and open space will be available in the near future. One resource for the town that will continue is the CPA – although an individual town's share of revenues will decrease with the decrease in real estate transactions and the number of new towns in the Commonwealth which adopt this ordinance.

The potential for a new library/community center will be a welcome addition to the town to address educational needs and serve as community gathering spot. The lack of a standing Recreational Committee needs to be recognized with the establishment of a permanent standing committee to implement this plan together with the current Open Space Committee. A town dialogue on trail use for different purposes could be convened by these two committees together.

It is also very important that the town pursue high-speed Internet for town-wide use. E-mail and high speed Internet have become a facet of modern life, and necessary for people to pursue businesses as well as work from their homes, and to attract new residents and retain existing residents in today's technological age. It is also a continuing educational resource for information on a multitude of subjects – including

individual stewardship activities by landowners to reduce their carbon footprint and conduct ecologically sound practices. High-speed Internet access is also a necessity for public school students. Wi-Fi Internet service (as well as cellular phone service) are not feasible for much of the town, because the undulating terrain (i.e., numerous hills and deep valleys) and the abundant trees in Shutesbury and the surrounding towns adversely impact signal reception. Therefore, the town is presently pursuing high-speed Internet access for the entire town through the Wired West Cooperative, which will provide the service via fiber optic cable.

SECTION 8: GOALS AND OBJECTIVES

According to a 2005 land-use update for Shutesbury (Stone, 2005), 87% of the town is forested, and 2% is surface water. Shutesbury's forest serves as an important watershed for two public drinking water supplies, the Quabbin Reservoir and Atkins Reservoir, and two high-quality, cold-water fisheries streams, the Sawmill River and West Branch of the Swift River, and their tributaries. It also contains some of the largest contiguous blocks of interior forest in the Commonwealth. According to the January 22, 2010 draft of DCR's *Forest Futures Visioning Process*, "*These forest blocks represent an enormously-important resource for current and future generations, providing critical habitat for protection of biodiversity and important opportunities for mitigation of climate change through capture and storage of carbon in trees and soils*." While the residents enjoy the many benefits this forest provides, they are also the local stewards of this forest land that is important on a regional and state level. Therefore, many of the goals and objectives are concerned with protecting this valuable resource. The goals and objectives that are listed below will be addressed in greater detail in the following chapter, *Section 9: Seven-Year Action Plan*, where detailed actions and timelines for implementing them will be described and responsible parties will be identified.

GOAL 1: Preserve Clean Air, Clean Water, Wildlife Habitat, Biodiversity, and Other Qualities of Life in Shutesbury through Protection and Conservation of our Natural Resources.

Objective 1: *Use all available resources (including Chapter 61 incentives, the recently-enacted Open Space Design zoning, the Community Preservation Act and others) to work with willing landowners to permanently protect the land in Shutesbury that contains the Commonwealth's forest cores and top 1% and 10% largest interior forest blocks (depicted on Map F1).*

Objective 2: *Apply criteria listed below to prioritize properties for open space protection and acquisition. One possible way properties could become available is through the Chapter 61 Right of First Refusal; the committee would advise the town on the relative desirability of protection of those properties. The availability of opportunities will control any projects that might be undertaken. High-priority properties would meet several criteria simultaneously. The criteria, not necessarily in order or priority, include:*

- Important water features, including falls, springs and distinctive or unique wetlands or large wetland complexes;
- Rare species habitat and vernal pools;
- Areas that connect or enlarge protected areas, create conservation corridors or provide ecologically-intact buffers to streams;
- Areas of high wildlife habitat diversity and value, including NHESP-designated areas and BioMap2 Core Habitats and Critical Natural Landscapes;

- Parcels containing high-quality, cold-water fisheries streams;
- Areas of high visual or aesthetic value (for example, vistas);
- Locations providing recreational access to lakes, streams and trail nodes;
- Unique or distinctive historical, archaeological or geological features;
- Open fields and non-forested land;
- Areas subject to a threat of development; and,
- Undeveloped properties of 20 acres or more.

Objective 3: *Work with town boards and committees, willing property owners and the Town of Amherst on open space and conservation projects that will preserve the important aspects of Shutesbury's landscapes.*

GOAL 2: Enhance and Increase Recreational Opportunities in Shutesbury for its Residents

Objective 1: *Reactivate the Recreation Committee by strong advertising and soliciting for volunteers, and engage it to work on recreation issues in town.*

Objective 2: *Develop new and enhance existing recreational opportunities in town, with due consideration to providing access for person with disabilities.*

Objective 3: *Increase public information on the types of recreation available in town, including on conservation areas, Quabbin land, Lake Wyola State Park, school and town properties, and Shutesbury State Forest.*

GOAL 3: Encourage Good Stewardship of the Land and Forest to Maintain the High Environmental Quality of Shutesbury.

Objective 1: *Engage residents in maintaining their interest in clean air and water and the rural, quiet nature fostered by the high percentage of forested land within town.*

GOAL 4: Develop Better Working Relationships with Area Land Trusts for Common Goals.

Objective 1: *Develop and maintain a formal affiliation with local land conservation groups to maximize land protection opportunities for the town.*

SECTION 9: SEVEN-YEAR ACTION PLAN

INTRODUCTION TO GOALS AND OBJECTIVES

Goals, objectives and actions listed in an action plan reflect three tiers of conceptual planning. A "goal" is a broad statement or vision of an integrated outcome which will accrue for the town. An "objective" is a second tier of planning activity which provides more discrete direction to attaining the overall goals through more-focused activities. Actions listed in the Action Plan are the most discrete level of activities with a designated timetable and lead entity for implementation listed. All three tiers are related and may overlap. All three tiers constitute a framework in which the public can learn of actions to participate in and the relationship of such actions to the four overriding goals for the town. Areas of town scheduled for actions under this 7-year Action Plan are depicted on the Action Plan Map (Map 8). Because the Open Space and Recreation Plan received conditional approval in March 2019, the final approved Plan expires at the end of March 2019.

Funding for the 2014 Open Space and Recreation Plan goals will come from a variety of sources. Some of the goals can be accomplished by using existing departmental budgets, while other goals will require funding assistance from outside sources, such as state grants for land protection. The town is accruing funds at a slow rate through the CPA, and CPA funds will be used to fund several conservation land projects in 2015. There are also funds in the Conservation Commission's Land Fund if they wish to support land protection and conservation land management projects in town. In the past, the town has been supportive of funding land projects at Town Meeting, especially if combined with a grant.

Town board and committee members and other volunteers will be needed to assist in carrying out some of the organizational and educational actions. The town is fortunate to have the dedicated volunteers from the Lake Wyola Association monitoring the water quality of the lake by performing sampling at all the lake's beaches each summer for *E. coli* bacteria, as well as other sampling for dissolved oxygen, clarity, conductivity and pH in the middle of the lake. The latter sampling has been done monthly since 1991, so there is good data for historic trends. Other volunteers could be trail monitors, or participate in Stream Teams to protect and monitor the cold water streams in town. The DCR Recreational Trails Grants provide funding for trail construction and stewardship projects, with volunteer effort often an important part of the local match. These grants could be used to develop and fund construction of a trail in town that is accessible to persons with disabilities.

Other town-donated labor or materials may be necessary to complete certain projects. In some cases, town committee members will need to meet with other groups (such as land trusts, the Town of Amherst, etc.) in order to accomplish some of the actions in the plan. In other cases, project completions will rely on labor and expertise provided by town officials or citizen volunteers. The Town Highway Department may be able to provide materials or labor to complete some projects, such as trail construction, skating rink construction, and stone removal and grading for recreational areas such as soccer fields, tennis courts, etc. Finally, town-approved funding may be needed for some

projects and require approval by a vote at Town Meeting. Due to limitations in the town budget, the town will seek to obtain donated materials and expert services gratis or at reduced rates, whenever possible.

Regional land trusts, such as Kestrel Land Trust and the North Quabbin Regional Landscape Partnership, have been very helpful with land protection projects and outreach to landowners, and we anticipate continuing work with them. State grants are an important part of the funding formula, ranging from Local Acquisitions for Natural Diversity (LAND) and Parkland Acquisitions and Renovations for Communities (PARC) recreational grants, to those received through land trusts, such as the Landscape Partnership Program and Conservation Partnership Grant. On the federal level, there is the Forest Legacy Program for the permanent protection of forest land.

In addition, there are a number of state and federal programs that provide free assistance with forest and wildlife habitat management and/or provide some funding to perform management. On the federal level, this includes Environmental Quality Incentives Program (EQUIP), which includes wildlife habitat (what used to be WHIP), administered through NRCS. On the state level, there are Forest Stewardship Grants and assistance and the Forest Viability Program through DCR, assistance through the UMass Forestry Extension Landowner Programs, the Keystone Project sponsored by several state and private organizations, including Harvard Forest, and the Community Forest Stewardship Grants through DCR for town forests.

If the landowner's property contains high-quality or rare species habitat, permanent protection is a high priority, but assistance in managing the habitat for the rare species is also important. The Land Protection Program, a joint project of the Massachusetts Department of Fish & Game and its Division of Fisheries and Wildlife is for acquisition of sites that support rare species and exemplary natural communities. The Landowner Incentive Program (LIP) is a federally-funded program managed by the Division of Fisheries & Wildlife to restore and maintain rare species habitat on privately-owned lands. The federal North American Wetlands Conservation Act (NAWCA) Grants are for the "*protection, restoration, and management of wetland ecosystems and associated habitats*" needed by waterfowl and other migratory birds.

Goal 1: Preserve Clean Air, Clean Water, Wildlife Habitat, Biodiversity, and Other Qualities of Life in Shutesbury through Protection and Conservation of our Natural Resources

Objective 1: *Use all available resources (including Chapter 61 incentives, the recently-enacted Open Space Design zoning, the CPA and others) to work with willing landowners to permanently protect the land in Shutesbury that contains the Commonwealth's forest cores and top 1% and 10% largest interior forest blocks (depicted on* Map F1*).*

Actions	Schedule	Responsible Party
Provide for the implementation of this Plan by ensuring that the Open Space Plan Committee continues to be adequately staffed by members committed to attending meetings and carrying out the committee's responsibilities.	2015-2019	Select Board
Familiarize all appropriate town committees, boards, property owners of primarily-forested land and other residents with the boundaries of these forest cores and interior forest blocks (Map F1) and the importance of their contiguous nature.	2015-2019	Open Space Committee
Monitor the status of Chapter 61, 61A and 61B lands within this area and encourage landowners to maintain the enrollment of these lands in these programs, and to encourage others to join.	2015-2019	Select Board, Assessors, Town Administrator, Farm & Forestry Commission
Establish a landowner relations committee, to dialog with landowners who own large tracts or have land with trails used by the public, to work together to maintain forest land and free public recreational use.	2015-2019	Select Board, Recreation Committee, Farm & Forestry Commission
Ensure that the Community Preservation Act Committee is informed of any potential sales of Chapter 61 lands for which CPA revenue may be applied for purchase.	2015-2019	Town Administrator
Work with adjacent towns, local land trusts, willing property owners and the DCR through its Future Forest Vision Plan and other methods to permanently protect these forest cores and interior forest blocks.	2016-2019	Open Space Committee, Conservation Commission
Host a public forum on the value of preserving contiguous land parcels with a panel of forestry ecologists, and wildlife specialists as speakers.	2015-2016	Open Space Committee
Ensure that the town has in place a procedure for notification and review by town boards of Chapter 61 lands that come up for sale, in order for the decision on "right of first refusal" to be made within the required time period.	2015-2016	Select Board, Town Administrator

Objective 2: *Apply criteria listed below to prioritize properties for open space protection and acquisition. One possible way properties could become available is through the Chapter 61 Right of First Refusal; the committee would advise the town on the relative desirability of protection of those properties. The availability of opportunities will control any projects that might be undertaken. High-priority properties would meet several criteria simultaneously. The criteria, not necessarily in order or priority, include:*

- Important water features, including falls, springs and distinctive or unique wetlands or large wetland complexes;
- Rare species habitat and vernal pools;
- Areas that connect or enlarge protected areas, create conservation corridors or provide ecologically intact buffers to streams;
- Areas of high wildlife habitat diversity and value, including NHESP-designated areas and BioMap2 Core Habitats and Critical Natural Landscapes;
- Parcels containing high-quality, cold-water fisheries streams;
- Areas of high visual or aesthetic value (for example, vistas);
- Locations providing recreational access to lakes, streams and trail nodes;
- Unique or distinctive historical, archaeological or geological features;
- Open fields and non-forested land;
- Areas subject to a threat of development; and,
- Undeveloped properties of 20 acres or more.

Actions	Schedule	Responsible Party
Apply criteria listed above to prioritize properties for open space protection and acquisition, focusing on particular criteria each year through yearly joint meetings and site visits, at a minimum.	2015-2019	Conservation Commission, Open Space Committee

Objective 3: *Work with town boards and committees, willing property owners and the Town of Amherst on open space and conservation projects that will preserve the important aspects of Shutesbury's landscapes.*

Actions	Schedule	Responsible Party
Work with the Planning Board and Conservation Commission on open space options when new development plans come in under the Open Space Design zoning.	2015-2019	Planning Board, Open Space Committee, Conservation Commission
Designate scenic roads in Shutesbury, and provide protection for stone walls **(according to Scenic Roads Act and MGL Chapter 266 Section 94)**.	2016-2018	Planning Board, Historical Commission
Work with Amherst Water Department staff to develop a permanent CR and a watershed protection district zoning bylaw on Amherst's watershed lands in Shutesbury.	2016-2018	Planning Board, Town Administrator, Town Counsel, Open Space Committee, Water Resources Committee
Conduct a local Heritage Landscape Inventory, in a manner similar to DCR's "Heritage Landscape Inventory" with the Historical Commission, Town Center Committee, Planning Board, Conservation Commission, Select Board, Open Space Committee and other interested residents. Identify important heritage landscapes in town and create a list of possible methods to protect these areas with the above-listed groups, CPA Committee and land trusts.	2015-2019	Historical Commission, Town Center Committee, Planning Board, Conservation Commission, Select Board, Open Space Committee
Develop and maintain an ongoing collaborative relationship between the Select Board, Planning Board, Conservation Commission, Water Resources Committee and Open Space Committee for the review of important new projects proposed for town that will impact surface or ground water quality or quantity, air quality, or create significant land alternation, such as alternative energy systems or high-density residential developments.	2015-2019	Select Board, Planning Board, Board of Health, Conservation Commission, Water Resources Committee

Goal 2: Enhance and Increase Recreational Opportunities in Shutesbury for its Residents

Objective 1: *Reactivate the Recreation Committee by strong advertising and soliciting for volunteers, and engage it to work on recreation issues in town.*

Actions	Schedule	Responsible Party
Designate members of a town Recreation Committee, since a committee dedicated to recreational activities does not currently exist.	2015-2016	Select Board
Encourage communication and cooperation between the Recreation, Open Space and Community Preservation Committees and Conservation Commission on recreation ideas.	2015-2019	Select Board
Work with willing private landowners on easements for trail use, rules for users, signage and parking.	2015-2019	Open Space & Recreation Committees, Conservation Commission

Objective 2: *Develop new and enhance existing recreational opportunities in town with due consideration to providing access for persons with disabilities.*

Actions	Schedule	Responsible Party
Convene a Recreation Summit annually during the fall to consider community priorities for recreational activities (either new, improved or expanded) and confer with the CPA Committee to determine applications which have been received which may need additional funds and or matching grant opportunities. Seek to incorporate projects in the town's capital funding budget request.	2015-2019	Recreation Committee, Town Administrator

Actions	Schedule	Responsible Party
Convene a public forum on public use of public and private trails, to educate residents and other users of property owners' rights and concerns, and user responsibilities (i.e., a code of etiquette). Discussion topics will include: respect of private property, reduction of noise, littering, habitat alterations and other problematic issues.	2015-2016	Open Space Committee
Publicize locally the sections of the New England National Scenic Trail as they are completed and available for hiking in the Shutesbury area.	2015-2019	Open Space Committee
Develop access for persons with disabilities to at least one trail in town and enlist volunteers (e.g., Shutesbury Elementary School students, Boy Scouts, Morse Hill Recreation Center and area camps) to help in construction, exhibits and signage.	2015-2019	Conservation Commission, Select Board, Americans with Disabilities Act Committee, Open Space Committee
Ensure that the Cultural Council adequately publicizes its guidelines and application deadlines and allows applicants adequate preparation time to develop an application for funding for recreational activities which provide cultural benefits.	2015-2019	Select Board, Town Administrator
Sponsor annually one public walk or workshop where residents can learn more about the nature of Shutesbury. Ideas include: values of freshwater wetlands; a mushroom, tree or fern identification walk; an animal tracking workshop; visits to unusual stone structures; a geology field trip; and/or wildflower walk.	2015-2019	Conservation Commission, Open Space Committee, Historical Commission, M.N. Spear Memorial Library
Work with DCR on restoration of the Bennett House at Lake Wyola State Park, to be used as a town gathering area or recreational facility.	2015-2019	Recreation Committee, Select Board

Actions	Schedule	Responsible Party
Convene a committee of interested residents to discuss methods for demarcating and enforcing the existing near-shore safety zone on Lake Wyola for non-motorized watercraft in the area extending 150 feet from the shore (i.e., the area of the 5 mph maximum speed limit established by the town's *Bylaw Concerning Watercraft and Persons Using Lake Wyola*). At swimming areas established and marked at the state, town or East, West or North Lake Wyola Association beaches, the width of the safety zone would be limited to the area between the limits of the marked swimming areas and the 150-foot markers. The safety zone could be demarcated by a series of approved, widely-spaced buoys, anchored to a mooring system, that would clearly mark the area without interfering with boats coming in to shore to moor.	2016-2017	Recreation Committee, Select Board, Lake Wyola Advisory Committee, Shutesbury Police Department, Massachusetts Environmental Police
Construct a canoe and kayak storage facility at the Randall Road boat launch to be used by town residents for convenient access to Lake Wyola. Financing for the project would be obtained from Community Preservation Act funds. The facility might consist of individual, locking compartments or some other practical design.	2015-2016	Recreation Committee, Select Board, Conservation Commission

Objective 3: *Increase public information on the types of recreation areas available in town, including conservation areas, Quabbin land, Lake Wyola State Park, school and town properties and Shutesbury State Forest.*

Actions	Schedule	Responsible Party
Develop and maintain a map on the town's web site of public land with trails open to the public for passive recreation, and alert users to conform to any restrictions as indicated by posting.	2015-2017	Open Space Committee, Conservation Commission

Actions	Schedule	Responsible Party
Post recreational activities occurring within town on the town's web site, listing type of activity, time and location for specific activities and locations for general recreational activities, including: -- Ongoing afternoon and evening recreational activities for adults at Shutesbury Elementary School; -- Activities sponsored by the M.N. Spear Memorial Library; -- Private classes open to the public at individuals homes (information to be provided by the instructor); and, -- Activities sponsored by Lake Wyola State Park, the Lake Wyola Association, the Shutesbury Athletic Club and other private entities.	2015-2019	Select Board, Web Site Committee, Recreation Committee
Designate an area on town-owned land to be used for community gardens as well as a committee of town residents to oversee implementation and maintenance.	2015-2019	Farm & Forestry Commission

GOAL 3: Encourage Good Stewardship of the Land to Maintain the High Environmental Quality of Shutesbury.

Objective 1: *Engage residents in maintaining their interest in clean air and water and the rural, quiet nature that is fostered by the high percentage of forested land within town.*

Actions	Schedule	Responsible Party
Organize a volunteer corps to help monitor conservation areas and maintain trails.	2015-2019	Conservation Commission, Open Space Committee, Recreation Committee, Select Board

Actions	Schedule	Responsible Party
Prepare, maintain and update brochures or information on the town's web site on ways to be good stewards of the land and environment. Topics could include: • Recycling, composting and rain barrels; • Planting of non-invasive native species and hardy perennials which require less watering, and encourage mulching to reduce watering needs; • Promotion and support of local agriculture; • Promotion of good forest management for recreation, wildlife habitat and maximization of CO2 uptake; • Carpooling to designated areas to reduce the town's cumulative carbon footprint; • Recently-enacted bylaw to reduce noise and improve safety of motorized vehicles on Lake Wyola during the winter season; • Promoting the value of community gardens on town–owned land to allow residents to grow flowers, fruits and produce during the summer – thus contributing to food sources for declining populations of pollinators; encouraging the use of local foods, and allowing gardening opportunities for landowners with restricted sunlight on their properties; • Importance of periodic water quality testing of private wells; • Identification and control of invasive aquatic and upland plant species; • Use of Chapter 61 programs, CRs and estate planning to achieve land protection for the town and provide tax benefits for landowners; • Proper septic system maintenance; and, • Appropriate use, storage and disposal of pesticides, herbicides and other household hazardous wastes.	2015-2019	Farm & Forestry Commission; Recycling Committee, Conservation Commission, Board of Health, Select Board, Lake Wyola Advisory Committee

Goal 4: Develop Better Working Relationship with Area Land Trusts for Common Goals

Objective 1: *Develop and maintain a formal affiliation with local land conservation groups to maximize land protection opportunities for the town.*

Actions	Schedule	Responsible Party
Contact the Kestrel Land Fund, the North Quabbin Regional Landscape Partnership and the local representative for The Trustees of Reservations, to find out when their groups meet and how Shutesbury can play a more active role with them in land conservation efforts in town, including permanent conservation of land parcels and heritage site designations.	2015-2016	Open Space Committee
Work with land trusts to provide owners of significant parcels (i.e., large land tracts or parcels with other important features) with information on land protection opportunities, including permanent CRs and contact information for the area land trusts.	2015-2019	Open Space Committee, Conservation Commission

SECTION 10: PUBLIC COMMENTS

In February 2012, copies of the draft plan were distributed to a large number of individuals and organizations (see the list that follows). The plan was revised, based on these comments and made available for additional comment during a second public review period in January 2015. This section contains only those public comments that are required to be obtained in order to receive approval of the plan from the Massachusetts Executive Office of Energy and Environmental Affairs' Division of Conservation Services. The required comments that follow are from Melissa Cryan of the Division of Conservation Services, the Franklin Regional Council of Governments Planning Department, the Shutesbury Select Board, and the Shutesbury Planning Board.

Additional public comments were received from the following during either or both of the public comment periods: the Shutesbury Conservation Commission, the Shutesbury Board of Health, the Shutesbury Water Resources Committee, the Shutesbury ADA Committee, the Kestrel Trust, the North Quabbin Regional Landscape Partnership, the Lake Wyola Association, the Lake Wyola Advisory Committee, Cowls Lumber and several residents of Shutesbury. The Open Space Committee carefully reviewed all comments received during the two public review periods and found most of the comments very helpful and informative. Based on the public comments, the Open Space and Recreation Plan was revised to the extent possible within the scope and purpose of the plan. Those public comments that could be incorporated have enhanced the accuracy of the plan and ensure that it will address the needs and concerns that were expressed by the community.

List of Organizations & Individuals Sent a Copy of the Shutesbury Draft Open Space &Recreation Plan for Review in <u>February 2012</u>

Paper copies were available in the Town Hall and M. N. Spear Library.
Digital copy was available on the Shutesbury town web site.

Review Comments Were to be Returned by March 31, 2012.

Those who returned comments on this draft are shown in bold letters below.

<u>Groups Required to Provide Comments on the Plan:</u>

Select Board (Elaine Puleo, Al Springer, J. April Stein)
Planning Board (Deacon Bonnar)
Franklin Regional Council of Governments (Kimberly Noake MacPhee)
Mass. EOEEA, Division of Conservation Services (Melissa Cryan)

List of Organizations & Individuals Sent a Copy of the Shutesbury Draft Open Space &Recreation Plan for Review in February 2012 (Continued)

Additional Town Organizations:

Town Administrator (Rebecca Torres)
Town Clerk (Leslie Bracebridge)
ADA Committee (Martina Carroll)
Assessors (Ken Holmberg)
Board of Health (Bill Elliot)
Community Preservation Committee (Donald Fletcher)
Conservation Commission (Linda Scott, Clerk)
Council on Aging (Linda Scott/Muriel Gross)
Farm & Forestry Commission (Deacon Bonnar)
Historical Commission (Barbara Goodhind)
Lake Wyola Advisory Committee (David Green)
Library (Mary Anne Antonellis)
Recreation Committee (Richard Ferro)
School Committee (Michael DeChiara)
Town Center Committee (Fred Steinberg)
Water Resources Committee (Hugh Harwell)
Web Committee (Fred Steinberg)
Zoning Board of Appeals (Charles DiMare)

Additional Groups or Individuals:

Mass. Department of Conservation & Recreation - Office of Watershed Management, Quabbin (Jeff Lacy)
Mass. Department of Conservation & Recreation – State Parks (Gary Briere)
North Quabbin Regional Landscape Partnership (Jay Rasku)
Kestrel Land Trust (Kristin DeBoer)
Town of Amherst Director of Conservation & Development (David Ziomek)
Town of Amherst Water Department (Gabrielle Kurth)
Cowls Lumber (Cinda Jones)
Mass. Natural Heritage & Endangered Species Program (Misty-Anne Marold)

Written comments also received from a number of **residents**, the **Lake Wyola Association**, and the **Sirius Community.**

List of Organizations & Individuals Sent a Copy of the Final Draft of the Open Space &Recreation Plan for Review in February 2015

Paper copies were available in the Town Hall and M. N. Spear Library.
Digital copy was available on the Shutesbury town web site.

Review Comments Were to be Returned by March 6, 2015.
Those who returned comments on this draft are shown in bold letters below.

Groups Required to Provide Comments on the Plan:

Select Board (Elaine Puleo, J. April Stein, Michael Vinskey)
Planning Board (Deacon Bonnar)
Mass. EOEEA, Division of Conservation Services (Melissa Cryan)

Additional Town Organizations:

Town Administrator (Rebecca Torres)
Town Clerk (Leslie Bracebridge)
Conservation Commission (Linda Scott, Clerk)
Historical Commission (Leslie Bracebridge)
Water Resources Committee (Paul Lyons)

Additional Groups or Individuals:

Written comments also received from a few **residents, including the three Select Board Members**

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval Patrick
GOVERNOR

Timothy Murray
LIEUTENANT GOVERNOR

Richard K. Sullivan, Jr.
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181

March 6, 2012

Janice Stone
Shutesbury Open Space Committee
P.O. Box 276
Shutesbury, MA 01072

Re: Open Space and Recreation Plan

Dear Ms. Stone:

Thank you for submitting the draft Open Space and Recreation Plan for Shutesbury to this office for review and compliance with the current Open Space and Recreation Plan Requirements. This plan was particularly thorough and has been conditionally approved through March 2019. Conditional approval will allow the town to participate in DCS grant rounds through March 2019, and a grant award may be offered to the town. However, no final grant payments will be made until the plan is completed.

Once the following items are addressed, your plan will receive final approval:

1. History of Community – this section should include more information on the history of the 20th century.
2. Population Characteristics – a lot of time was taken to discuss past population characteristics, but more is needed on current information, including population density, family income, the town's industries, and employment trends.
3. Water Resources – please include information on flood hazard areas.
4. Vegetation – information on public shade trees is missing. Please include it.
5. Environmental Challenges – the section is missing information on chronic flooding, sedimentation, and environmental equity issues. Environmental equity refers to looking at the distribution of open space in the community and noting if there is a section (or sections) of the town that does not have access to it.
6. Section 5 – the table that list town-owned conservation properties in the appendix should include information on management agency, current use, condition, recreation potential, type of grant (if any) used to purchase or renovate the land, public access, zoning, and degree of protection. Please note that this is for town-owned conservation land only.
7. Analysis of Needs – the Community's Needs section is missing information on the SCORP and how it pertains to Shutesbury, as well as the needs of special groups, such as the handicapped and the elderly. The SCORP can be found online at http://www.mass.gov/eea/docs/eea/dcs/massoutdoor2006.pdf.

8. Seven-Year Action Plan – please identify a potential funding source for each objective.
9. Maps – the Regional Context map should be redone to give a better sense as to the region of the state the town is in. Also, the names of the surrounding communities are hard to read. If they were more legible, it may be easier to tell where the town is in the state.
10. Letters of Review – letters from the Regional Planning Agency, Planning Board, and Chief Municipal Officer are required. Please submit them.

Congratulations on undertaking such an important task. Please contact me at (617) 626-1171 or melissa.cryan@state.ma.us if you have any questions or concerns, and I look forward to reviewing your final plan.

Sincerely,

Melissa Cryan

Melissa Cryan
Grants Manager

From: "Kimberly Noake MacPhee" <natres@frcog.org>
Date: April 9, 2012 11:48:39 AM EDT
To: <rjstone2@verizon.net>
Cc: "'Peggy Sloan'" <psloan@frcog.org>
Subject: FRCOG comments on the Draft Shutesbury OSRP
Attachments: excerpts from 2010 Warwick OSRP - Section 5.doc; ATT00001.htm

Dear Ms. Stone:

Thank you for the opportunity to review the draft Shutesbury Open Space and Recreation Plan. You and the members of the committee are to be commended for the great work you've done over the last several years! The draft plan has many strengths, among which are the synergy between the draft OSRP plan and its recommendations and the information contained in the 2004 Master Plan and Open Space Design changes to the town's zoning in 2008; the intermunicipal goal of protecting Amherst's public water supply lands; and Appendix A, which is a helpful matrix of the Ch.61 process that could be shared with other Franklin Co. towns. The Action Plan lists a strategy for developing brochures for various topics so residents can be good stewards of the land and environment. This is a great idea and I hope that the brochures and web site postings could be shared with the FRCOG and other towns in Franklin Co.

I do have several questions and comments that may be helpful to you as you prepare the final draft of the plan for submittal to DCS.

1. What involvement did the Recreation Committee have in preparing the draft plan after the members split from the Open Space & Recreation Plan Committee? There is a heavy emphasis on open space in the draft plan and I know from previous conversations with Melissa Cryan at DCS that she is concerned about the recreation component not receiving enough emphasis in the plans for our Franklin Co. towns, given the focus on open space preservation which is always of high concern. There are many good recreation-related recommendations in the Action Plan but it isn't clear how the recommendations were developed and what sources of info were used – surveys, meetings, etc.

2. A related comment is what kinds of recreational opportunities are the baby boomers and seniors looking for? On p.13, the table shows that between 1990 and 2007, the population in the 45-64 year old category went up 243% and the population 64 years and older went up 28%. All other population categories

declined. Was there information gained from the survey that could provide information about the specific recreation needs of this group?

3. The detailed analysis that was done of the survey results and presented in the appendix could be better integrated into the text of Sections 6 and 7. It was not clear to me how the survey results were related to the goals, resource protection and community needs. Were there any conflicts or commonalities between the outreach done as part of this current effort and previous survey(s)?

4. You may want to consider adding a category of Potential Funding Sources to the Action Plan. This is a request that Melissa Cryan has made of us when we are updating OSRPs.

5. Warwick had a very good detailed discussion of criteria to use in a prioritization process for selecting land for conservation. The section was written by Mary Williamson. I've included it for your information if you are interested in augmenting Sections 5 and 9 of your draft plan.

6. You may want to consider adding a paragraph on Open Space Equity to Section 5. This is another comment we've received from Ms. Cryan. Open Space Equity involves taking a look at conservation and recreation opportunities available in the town and seeing if there is an area of the town that seems to be lacking resources. I hope these comments are helpful. Please feel free to contact me if you'd like to discuss them further. Good luck with completing your plan!

Kimberly

Kimberly Noake MacPhee, P.G.
Land Use and Natural Resources Program Manager
Franklin Regional Council of Governments
425 Main Street
Greenfield MA 01301
413.774.1194 x103
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SHUTESBURY PLANNING BOARD

TOWN HALL

SHUTESBURY MA 01072

February 19, 2015

Shutesbury Open Space Committee

1 Cooleyville Road

Shutesbury, MA 01072

The Planning Board heartily approved your Open Space and Recreation Plan of January 2015. We hope to make good use of it in an updated master plan in the relatively near future. During our discussion of the open space plan we noted that Meetinghouse Hill was the highest point in town and might well, in future, be recognized as a unique scenic resource. We greatly honor your committee for the lengthy and wide ranging effort that produced your new plan.

Gratefully,

Deacon Bonnar

Deacon Bonnar

Chair, Planning Board

TOWN OF SHUTESBURY
SELECTBOARD
P.O. Box 276
Shutesbury, MA 01072
Fax (413) 259-1107
E-mail selectboard@shutesbury.org

March 10, 2015

Janice Stone
Shutesbury Open Space Committee
1 Cooleyville Rd.
Shutesbury, MA 01072

Dear Janice,

The Shutesbury Selectboard has reviewed the updated version of the Open Space Plan prepared by the Shutesbury Open Space Plan with great appreciation.

The work that has gone into this document is outstanding. We will make sure this document is made available to the public at the library, town hall and on the Shutesbury.org website.

We applaud the efforts of your Committee. Congratulations on a job well done.

Sincerely,

Elaine Puleo
Selectboard Chair

April Stein
Selectman

Michael Vinskey
Selectman

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181

April 21, 2015

Janice Stone
Shutesbury Open Space Committee
P.O. Box 276
Shutesbury, MA 01072

Re: Open Space and Recreation Plan

Dear Ms. Stone:

Thank you for submitting Shutesbury's Open Space and Recreation Plan to this office for review for compliance with the current Open Space and Recreation Plan Requirements. I am pleased to write that the plan is approved. This final approval will allow Shutesbury to participate in DCS grant rounds through March 2019.

Congratulations on a great job. Please call me at (617) 626-1171 if you have any questions or concerns about the plan.

Sincerely,

Melissa Cryan

Melissa Cryan
Grants Manager

SECTION 11: REFERENCES

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MAPS

APPENDICES

Appendix A: Supplemental Information on Chapter 61, 61A and 61B

CHAPTER 61, 61A AND 61B LANDS

Land within the town of Shutesbury is primarily forested and comprises approximately 86% of the town. The woods in Shutesbury are generally healthy, northeastern transition forests. This heavily-forested nature of the town has resulted in many landowners enrolling their land as Chapter 61 lands (forestry), and to a lesser extent Chapter 61B lands (recreational) and Chapter 61A lands (agricultural and horticultural). Since approximately 35**%** of the land in Shutesbury is enrolled in the Chapter 61 program, the type of environmental amenities provided to the town are significant.

Chapter 61 forest land is defined as land devoted to the growth of forest products, such as wood, timber, Christmas trees, other tree forest growth and any other product produced by forest vegetation.

Chapter 61A agricultural land is defined as land primarily and directly used in raising animals, such as dairy cattle, beef cattle, poultry, sheep, swine, horses, ponies, mules, goats, bees and fur-bearing animals, for the purpose of selling such animals or a product derived from such animals. Chapter 61A horticultural land is defined as land primarily and directly used in raising fruits, vegetables, berries, nuts and other foods for human consumption, feed for animals, tobacco, flower, sod, trees, nursery or greenhouse products, and ornamental plants and shrubs for the purpose of selling these products; or when primarily and directly used in raising forest products under a certified forest management plan, approved by and subject to procedures established by the state forester, designed to improve the quantity and quality of a continuous crop for the purpose of selling these products.

Chapter 61B recreational land is defined as land retained in a substantially natural, wild, or open condition or in a landscaped or pasture condition or in a managed forest condition under a certified forest management plan approved by and subject to procedures established by the state forester in such a manner as to allow, to a significant extent, the preservation of wildlife and other natural resources, including but not limited to, ground or surface water resources, clean air, vegetation, rare or endangered species, geologic features, high quality soils, and scenic resources. Chapter 61B recreational land is also land which is devoted primarily to recreational use and which does not materially interfere with the environmental benefits which are derived from the land, and is available to the general public or to members of a non-profit organization or corporation. The definition of recreational use is limited to the following: hiking; camping; nature study and observation; boating; golfing; non-commercial youth soccer; horseback riding; hunting; fishing; skiing; swimming; picnicking; private, non-commercial flying, including hang gliding; archery; target shooting; commercial horseback riding and equine boarding.

Increased population growth coupled with new residential housing developments, highway infrastructure development and commercial and industrial development resulted in the sale of open lands at considerable profit to landowners – often resulting in a down-

ward spiral of less open space, as taxes on marginal agricultural lands and forested lands increased to accommodate municipal costs associated with increased infrastructure. For many communities, the incentive of immediate tax revenue from new development was attractive -- with little future consideration of the cost of expanding and maintaining infrastructure and providing municipal services for new development. Enacted amendments of state tax laws required cities and towns to reduce assessments of farm, forest and open space lands, provided that the owners made a commitment to keep their lands in one of more of those uses (Mount Grace Land Conservation Trust, Inc., November 2007).

The lessened tax rates provided by these statutes were viewed as a "quid pro quo" for the non-market community environmental benefits provided by keeping these lands in open space – namely, preservation of drinking water supplies, wildlife habitat, clean air and – increasingly, more importantly, the continued uptake of CO_2 by the forests. On a national scale, it is estimated that 10 to 13% of the carbon the U.S. emits into the atmosphere annually is recovered by trees. Preservation of healthy forestland results in a sequestration of this carbon when: (1) additional trees are planted; (2) deforestation is avoided; and (3) sustainable forestry management is practiced (New England Forest Forestry Foundation and Manomet Center for Conservation Sciences Web Site). The loss of significantly-forested areas in Shutesbury would deny this important ecological role of its intact forest system.

Perhaps the most noteworthy feature of the Chapter 61 program is the fact that the town retains the "right of first refusal" for any land proposed for sale or which would entail conversion of the lands to other purposes. The town may also transfer their right of first refusal to another non-profit organization, such as a land trust. The town or other party has 120 days to act on their decision, if they decide to purchase the property. In addition, withdrawal from this program, together with a change in use, may trigger a financial penalty for the landowner. The following table includes selected sections from the document titled *Conservation and Land Use Planning under Massachusetts Chapter 61 Laws, A Primer for Cities,Towns and Conservation Organizations* (Mount Grace Land Conservation Trust, Inc., November 2007), with additional information taken from the current Chapter 61 ,61A and 61B statutes.

	Chapter 61 Forest Lands	**Chapter 61A Agricultural and Horticultural Lands**	**Chapter 61B Open Space or Recreational Lands**
General Description	Tax incentives to manage land for forestry.	Tax incentives to conserve agricultural and horticultural lands. These are applicable to farmland, certified forest lands and some farm accessory lands.	Tax incentives to conserve land in a "natural, wild, open, pastured, managed forest or landscaped condition or for recreational use."

	Chapter 61 Forest Lands	Chapter 61A Agricultural and Horticultural Lands	Chapter 61B Open Space or Recreational Lands
Eligibility Requirements	A minimum of 10 contiguous acres being managed under a10-year forest management plan approved by the State Forester. The plan should include management activities such as timber harvesting or timber stand improvement. For at least 2 years prior to classification, the land must have been devoted to a use that was "not incompatible" with forest production.	A minimum of 5 acres; the land must have been used for agricultural or horticultural purposes for at least 2 previous years. There are required annual sales of horticultural and agricultural products of at least $500 for the first 5 acres, $5 per acre for each additional acre of farmland and $0.50 per acre of forest land or wetland.	A minimum of 5 acres to be retained in a "natural, wild, open, pastured, managed forest or landscaped condition or for an approved recreational purpose."
Defined Use	Land devoted to the growth of "forest products," defined as "wood, timber, Christmas trees, other forest growth and other products produced by forest vegetation."	"Agricultural Use" is defined as raising animals for the purpose of selling such animals or animal products. "Horticultural Use" is defined as raising fruits, vegetables and other foods for human consumption or green-house products or forest products.	a) "Land retained in a substantially natural, wild or open condition….to allow the preservation of wildlife and other natural resources:" or, b) "Land for certain permitted recreational purposes …open to the public or members of a non-profit organization. Recreational use must not "materially" interfere with the environmental benefits of the land.

	Chapter 61 Forest Lands	Chapter 61A Agricultural and Horticultural Lands	Chapter 61B Open Space or Recreational Lands
Enrollment and Renewal Process	The application must be submitted to the State Forester by July 1 of the year prior to the tax year in which the Ch. 61 classification will go into effect. By October 1, the State Forester's certification and management plan must be submitted to the Assessors Office. To maintain enrollment, the property owner must obtain recertification and approval of the management plan from the State Forester and submit these documents to the Assessors every 10 years.	The application must be submitted to the Board of Assessors by October 1 of the year prior to the tax year in which the Ch. 61A classi-fication will go into effect. Annual reapplication is required.	The application must be submitted to the Board of Assessors by October 1 of the year prior to the tax year in which the Ch. 61B classification will go into effect. Annual reapplication required.
Property Tax	Valuations are determined by the Farmland Valuation Advisory Committee on or before February 1 of a given calendar year. Valuations are based on forest production purposes and are higher west of the Connecticut River. The Assessors may assign a property an above average or below average rating, depending on their assessment of indicators of productivity. Buildings on land taxed under Ch. 61 are taxed at the general tax rate and land and buildings used for dwellings and normal family living are taxed at the general tax rate.	Valuations are determined by the Farmland Valuation Advisory Committee by January 1 of a given calendar year. Valuations are based on agricultural and horticultural production purposes. Buildings on land taxed under Ch. 61A are taxed at the general tax rate and land and buildings used for dwellings and normal family living are taxed at the general tax rate.	The tax is based on the property's use for open space or recreation. The reduction is at least 75% of the Chapter 59 (general state tax law) tax, based on the fair market value of the property. Buildings on land taxed under Ch. 61B are taxed at the general tax rate and land and buildings used for dwellings and normal family living are taxed at the general tax rate.

	Chapter 61 Forest Lands	Chapter 61A Agricultural and Horticultural Lands	Chapter 61B Open Space or Recreational Lands
Appeals	On or before December 1, the Assessors may appeal to the State Forester to have land removed from Ch. 61 classification/certification. The owner or the Assessors may appeal the State Forester's final decision to a 3-member panel. The panel's decision may be appealed by either party to Superior Court.	The owner may appeal to the appellate tax board, if the application is denied.	The owner may appeal to the appellate tax board, if the application is denied.
Lien	Following approval, the town records a lien on the property at the Registry of Deeds. This notifies all potential purchasers that the property is subject to the Chapter 61 laws. The Assessors must record a statement at the Registry when the land no long qualifies for the program.		
Notice to Town of Conversion to Non-qualifying Use	A notice must be issued to the Town Manager or Select Board, Board of Assessors, Planning Board, Conservation Commission and State Forester (via certified mail) when any of the enrolled land may be sold or converted to a non-qualifying use. This requirement extends for a full year after not being taxed under the program.		
Town's Right of First Refusal	Formal notification triggers the 120-day option period, giving the town the right of first refusal to meet a "bona fide" offer to purchase the land in the event of a sale. In the event of a conversion, the town has the option to pay fair market value for the property. The town must pay for the first property appraisal. Notice of exercise must be recorded at Registry of Deeds within 120 days of exercising the option by the town, non-profit organization or Commonwealth.		
Town's Assignment/ Conveyance of Right of First Refusal to a Third Party	The town's "right of first refusal" may be assigned to a qualified, non-profit conservation organization or the Commonwealth. The assignment shall be for the purpose of maintaining no less than 70% of the land in use as forest land (as defined under Chapter 61), as agricultural and horticultural land (as defined under Chapter 61A) or as recreational land (as defined under Chapter 61B). In no case shall the assignee develop a greater proportion of the land than was proposed by the developer whose offer gave rise to the assignment. All land, other than land that is to be developed, shall then be bound by a permanent deed restriction.		
Betterment Assessments	Land qualifying for taxation under Ch. 61, 61A or 61B is subject to betterment assessments to the extent that the facility financed by the assessment is used for the personal benefit of the landowner, improving the forest production capability use of the land (for Ch. 61 lands), improving agricultural or horticultural use (for Ch. 61A lands) or for improving the recreational use capability of the land (for Ch. 61B lands). Upon application by the owner, the assessment may be suspended until the land use changes, at which time the assessment and interest (computed from the time of change in use) are due.		

	Chapter 61 Forest Lands	Chapter 61A Agricultural and Horticultural Lands	Chapter 61B Open Space or Recreational Lands
Change of Use Withdrawal and Failure to Reapply	Any land valued, assessed and taxed under the provisions of one of the particular chapters, if sold for another use or changed to another use not consistent with any of the three chapters, is subject to a Conveyance Tax or a Rollback Tax. The landowner will only pay the higher of the two tax penalties, not both. Rollback Taxes will apply when the amount of those taxes exceeds the amount, if any, imposed under the Conveyance Tax section for that particular chapter. In the same way, when Rollback Taxes do exceed the amount imposed for the Conveyance Tax penalty, then the land is not subject to the Conveyance Tax. Simply withdrawing from a chapter program may not result in any penalty taxes. For more detailed information on Chapter 61 penalty taxes, see below. Failure to reapply to a chapter program by the required date will result in paying full Chapter 59 taxes, until the landowner reapplies to Chapter 61, 61A or 61B.		
Change of Use on Part of the Property	If a change of use occurs on a portion of the land under a chapter program, and that change is not to a land use covered by Chapter 61, 61A or 61B, then only that portion of the land where the change of use occurred will be subject to Rollback Taxes or Conveyance Taxes.		
Rollback Taxes	Whenever land under Chapter 61, 61A or 61B no longer meets the definition of land under one of those chapters, it is subject to Rollback Taxes. The Rollback Tax is assessed in the year in which the land is disqualified and in the 4 immediately preceding years in which it was valued, assessed and taxed under one of the Chapter 61 programs. For each year, the Rollback Tax is equal to the difference between the tax paid or payable for that tax year under Chapter 61, 61A or 61B, and the taxes that would have been paid or are payable under the normal tax laws (Chapter 59 - the general property tax rate). The tax amount is also subject to simple interest at a rate of 5% per year. However, Rollback Taxes do not apply unless the amount of these taxes exceeds the amount of the Conveyance Tax, in which case the land is not subject to the Conveyance Tax.		

	Chapter 61 Forest Lands	Chapter 61A Agricultural and Horticultural Lands	Chapter 61B Open Space or Recreational Lands
Conveyance Tax	If **Chapter 61 or Chapter 61A land** is sold for a non-Chapter 61, 61A, or 61B use within a period of 10 years after the date of its acquisition or after the earliest date of its uninterrupted use by the current owner in forest production (for Ch. 61) or agriculture or horticulture (for Ch. 61A), whichever is earlier, the land shall be subject to a Conveyance Tax. The Conveyance Tax is assessed on the total sales price of the land, according to the following percentages: 10%, if sold within the first year of ownership; 9%, if sold in the second year, 8% in the third year; 7% in the fourth year; 6% in the fifth year; 5% in the sixth year; 4% in the seventh year; 3% in the eighth year; 2% in the ninth year; and 1% in the tenth year. **No conveyance tax is imposed if the land is sold after the tenth year of ownership.** If **land under Chapter 61B** is sold for a non-Chapter 61, 61A or 61B use within 10 years from the beginning of the fiscal year in which it was first classified under Chapter 61B, a Conveyance Tax is assessed on the total sales price of the land. The Conveyance Tax is 10%, if the property is sold within the first 5 years of first being classified under Chapter 61B, and 5%, if sold in the sixth to tenth years. A Conveyance Tax is assessed at the same rates if the owner does not sell the property but changes the use within 10 years of its date of first classification for recreational use. In this case, the Conveyance Tax is based on the fair market value of the property. **No Conveyance Tax is imposed if the land is sold after the tenth year of classification under Chapter 61B.** For lands that were previously under Chapter 61, 61A or 61B, **no Conveyance Tax is assessed on land sold to or for which a lesser interest in land is acquired by the town, the Commonwealth or a non-profit conservation organization, if the land is to be used for natural resource purposes.** However, if the non-profit conservation organization sells the land, or a portion of it, or converts it to commercial, residential or industrial use within 5 years, it must pay the Conveyance Tax that would have been due at the time of the original sale to the non-profit organization.		

The above table is presented to provide an overview of the Chapter 61, 61A and 61B programs for the citizens of Shutesbury. It contains information believed to be of most interest to landowners wanting to learn about the main elements of each of the Chapter 61, 61A and 61B programs for purposes of comparing the pros and cons of each program. More in-depth information on Chapter 61, 61A and 61B can be found at:

http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleIX/Chapter 61

http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleIX/Chapter 61A

http://www.malegislature.gov/Laws/GeneralLaws/PartI/TitleIX/Chapter 61B

Appendix B: Shutesbury 2006 Open Space and Recreation Survey

The Shutesbury Open Space Plan Committee

invites you to participate in a survey that will be used as a guide in

developing Shutesbury's Open Space and Recreation Plan.

Town Celebration 1937 Courtesy of the Shutesbury Historical Commission

Shutesbury 2006 Open Space and Recreation Survey

This survey is an effort by the Open Space Plan Committee to gather public opinion on questions regarding Open Space and Recreation in the Town of Shutesbury. The survey findings will be used to create a new Open Space and Recreation Plan for the town, as well as to provide information for other town committees to help guide them in their endeavors.

Your answers will remain anonymous and will be used for planning purposes only.

What is an Open Space and Recreation Plan?

"Open Space" in this survey refers to undeveloped land (fields, forests and wetlands) with particular conservation, recreation or scenic interest. An Open Space and Recreation Plan develops conservation and recreation goals for the town. It will include an analysis of the cultural and natural resources in town, identify open space and recreation needs, and outline a five-year action program with specific recommendations. While not a legally binding document, the Open Space and Recreation Plan will help identify the most important open space areas in town and the best ways to conserve them.

Why is an Open Space and Recreation Plan important?

- It will enable the town to apply for state grants for land conservation and recreation development and be positioned for other state competitive grants.
- It will provide the Select Board with a framework for decision-making when Chapter 61 lands or other properties become available.
- It will identify recreation needs of Shutesbury residents.

Please return your completed survey by MARCH 1, 2006. Please fold the survey making sure the address on the back of the last page is showing. Staple or tape closed. *One survey per person please.*

Mail To:
Shutesbury Open Space Plan Committee
c/o Shutesbury Select Board
Town Hall
P.O. Box 276
Shutesbury, MA 01072
OR
Drop in the labeled box at the following locations:
M.N. Spear Library, Post Office, or Town Hall

If any of your family members would like their own copies to fill out, they are available at the drop-off locations, and maybe on the Shutesbury website (http://www.shutesbury.org/index.htm), if we get really organized.

If you need special assistance, please contact Leslie Bracebridge, Town Clerk at 259-1204.

Q1. How important was each of the following in your decision to live in Shutesbury? *Please circle the number that best indicates how you felt about each characteristic.*

	Reasons to live in Town	Very Important	Important	Indifferent	Unimportant	Very Unimportant
a.	Rural or small town character	1	2	3	4	5
b.	Friends or relatives here	1	2	3	4	5
c.	Proximity to area colleges	1	2	3	4	5
d.	Easy commuting	1	2	3	4	5
e.	Participatory government	1	2	3	4	5
f.	Lower housing densities	1	2	3	4	5
g.	Perception of community values	1	2	3	4	5
h.	Peace & quiet	1	2	3	4	5
i.	Forests	1	2	3	4	5
j.	Trails	1	2	3	4	5
k.	Access to Quabbin Land	1	2	3	4	5
l.	Air/water quality	1	2	3	4	5
m.	Safety from crime and vandalism	1	2	3	4	5
n.	Public school system	1	2	3	4	5
o.	More affordable housing	1	2	3	4	5
p.	Recreational opportunities	1	2	3	4	5
	Other reasons (please list below)					
		1	2	3	4	5
		1	2	3	4	5

Q2. How do you feel about protecting the following natural, historical and scenic resources in town? *Please circle the number that best indicates how you feel about each resource.*

	Natural & Scenic Resources	Very Important	Important	Indifferent	Unimportant	Very Unimportant
a.	Tree-lined country roads	1	2	3	4	5
b.	Dirt or gravel roads	1	2	3	4	5
c.	Historic cellar holes	1	2	3	4	5
d.	Historic buildings	1	2	3	4	5
e.	Old stone walls	1	2	3	4	5
f.	Old stone structures (beehive caves, Town Pound, altar etc.)	1	2	3	4	5
g.	Wetlands	1	2	3	4	5
h.	Lake Wyola	1	2	3	4	5
i.	Habitat for wildlife	1	2	3	4	5
j.	Open fields	1	2	3	4	5

k.	The Old Town Hall	1	2	3	4	5
l.	The Spear Memorial Library	1	2	3	4	5
m.	The Town Common	1	2	3	4	5
n.	The Church on the Common	1	2	3	4	5
o.	Scenic views	1	2	3	4	5
p.	The "S-Curves" as they are now	1	2	3	4	5
q.	Large areas of forest	1	2	3	4	5
r.	Walking and hiking trails	1	2	3	4	5
s.	Brown's Pond & wetland	1	2	3	4	5
t.	Roaring Brook	1	2	3	4	5
u.	Peace & quiet	1	2	3	4	5
v.	Absence of city lights	1	2	3	4	5
w.	Clean streams and water bodies	1	2	3	4	5
x.	Clean air	1	2	3	4	5
	Other (Please list below)					
		1	2	3	4	5
		1	2	3	4	5

Q3. Where would you rather see future development occur? *Check one of the following:*

□ Along roadsides, to keep large tracts of back land undeveloped.
□ Set back from the road, to keep the roadside view less developed.
□ Other options – please list:_____

_____

Q4. How often do you use the following open space and recreational resources in town? *Please circle the number indicating the category of use.*

	Open Space & Recreational Resources	**Weekly**	**Monthly**	**Seasonally**	**Annually**	**Never**
a.	Quabbin Reservoir lands	1	2	3	4	5
b.	Lake Wyola State Park beach & facilities	1	2	3	4	5
c.	Randall Rd Town Beach	1	2	3	4	5
d.	Boat Ramp	1	2	3	4	5
e.	Lake Wyola Association beaches	1	2	3	4	5
f.	Atkins Reservoir land	1	2	3	4	5
g.	Powerline rights-of-way	1	2	3	4	5
h.	Abandoned roads	1	2	3	4	5
i.	Trails on public lands	1	2	3	4	5
j.	Trails on private lands	1	2	3	4	5

k.	State forest land	1	2	3	4	5
l.	Field behind Town Hall	1	2	3	4	5
m.	Field behind Fire Station	1	2	3	4	5
n.	Elementary School playground & fields	1	2	3	4	5
o.	Town Common	1	2	3	4	5
p.	Shutesbury conservation lands	1	2	3	4	5
q.	M&M hiking trail	1	2	3	4	5
	Other places (please list below)					
		1	2	3	4	5
		1	2	3	4	5

Q5. What would encourage you to use these resources more often?

_____

Q6. Which of the recreational opportunities below would you like to see developed in town? Please consider that town committees, run by volunteers, would do the work and that improvements to land would have to be funded by grants and or taxes. *Please indicate your priorities by circling a number.*

	Recreational Opportunities	**High Priority**	**Moderate**	**Low Priority**
a.	Soccer fields	1	2	3
b.	Ice skating rink	1	2	3
c.	Tennis courts	1	2	3
d.	Basketball court	1	2	3
e.	Public mountain bike trails	1	2	3
f.	Public nature/hiking trails	1	2	3
g.	Public cross-country skiing trails	1	2	3
h.	Handicapped accessible areas at Lake Wyola	1	2	3
i.	Community concerts/dances/movie times	1	2	3
j.	Recreational/social programs for teens	1	2	3
k.	Recreational/social programs for seniors	1	2	3
l.	Improved all-purpose playing field	1	2	3
n.	New playground	1	2	3
o.	Community gathering place	1	2	3
p.	Universally accessible trail behind Town Hall field	1	2	3
	Other (please list below)			
		1	2	3
		1	2	3

Q7. Are there specific natural/historical/archaeological areas in Shutesbury that the town should try to acquire, protect access to, or otherwise protect? *If yes, please list:*

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____

Q8. Public use of trails on private property is at the discretion of the private property owner, who can withdraw their permission at any time. Types of activities allowed on public land are determined by the public agency which owns or manages it, including conservation and watershed land. With this in mind, what activities do you support or oppose on public land or your land in town? *Please circle a "1" in the column to the right of the activities you support, a "2" if you are neutral about the activities, or a "3" if you oppose the activities, for the different circumstances represented in each column.*

	For each Activity	**If trails crossed your land**	**If trails are on public land and roads only**	**If trails are posted with trail standards & encouraged trail etiquette**
a.	Hiking, walking, running	1 2 3	1 2 3	1 2 3
b.	Horseback riding	1 2 3	1 2 3	1 2 3
c.	Mountain biking	1 2 3	1 2 3	1 2 3
d.	Snow-shoeing	1 2 3	1 2 3	1 2 3
e.	Cross-country skiing	1 2 3	1 2 3	1 2 3
f.	Snowmobiling	1 2 3	1 2 3	1 2 3
g.	All Terrain Vehicle use	1 2 3	1 2 3	1 2 3
h.	Other motorized vehicles	1 2 3	1 2 3	1 2 3

Q9 Have you personally experienced problems with motorized vehicles on trails in town? Yes [ ] No [ ]

Q10. The Town acquired the property Lot O32 across from the Highway Department on Leverett Road last year for future municipal use. How do you think it should be used? *Please indicate your feelings about each by circling a number.*

	Possible uses for the O32 property	**Yes**	**Uncertain**	**No**
a.	New library complex	1	2	3
b.	New highway, police, or fire station building	1	2	3
c.	Athletic fields	1	2	3
d.	Conservation land	1	2	3
	Other *(please list):*			

		1	2	3
		1	2	3
		1	2	3

Q11. What interesting wildlife have you seen, or seen signs of in town in the past few years?
Please circle each animal name:

a. bear	b. coyote	c. moose	d. great horned owl
e. bobcat	f. fisher	g. wood turtle	h. snowshoe hare
i. wild turkey	j. beaver	k. mountain lion	l. eagle
others (please list):			

Completion of the following questions is optional; they are asked just to see what kind of representation of opinion we are getting from different areas of town, and different groups of residents. You may answer some questions and not others if you wish.

Q12. What part of town do you live in? *Please circle one:*

a) Lake Wyola Area
b) Town Center Area
c) Leverett Road Area
d) Atkins Reservoir Area
di)
e) Cooleyville Road Area
f) Pelham Hill Road Area
g) West Pelham Road Area
h) Montague Road Area
i) Sand Hill & Pratt Corner Roads Area
j) Wendell & Locks Pond Roads Area
k) Baker & Schoolhouse Road Area
l) Leonard Road Area

Q13. What is your age*? Please circle the range that includes your age.*

a) 19 years old or younger
b) 20 – 44 years of age
c) 45 – 64 years of age
d) 65 – 78 years of age
e) 79 years of age and older

Q14. How many years have you lived in Shutesbury*? Please circle the range that best reflects the number of years you have lived in town.*

a) Less than 5 years
b) 5 to 14 years
c) 15 to 24 years
d) 25 to 49 years
e) 50 years or more
f) I am a native, I was born here.

Q15. How many people are in your household?
_____Total

Q16. Please circle the phrase that best describes your housing situation.

a) Renter
b) Seasonal Resident (property owner)
c) Year-round Resident (property owner)
d) Other (please explain)

Q17. If you own property in town, how many acres?
Please circle one.

a) Less than 3 acres
b) 3-9 acres
c) 10-49 acres
d) 50-99 acres
d) Greater than 100 acres
e) I do not own property in town.

Thank you very much for taking the time to complete and return this survey. We appreciate your input.

If you have any additional comments you would like to add, you may do so here:

Shutesbury Open Space Plan Committee
c/o Shutesbury Select Board
Town Hall
P.O. Box 276
Shutesbury, MA 01072

Appendix C: Comments on Shutesbury's 2006 Open Space and Recreation Survey

Comments on Shutesbury's 2006 Open Space and Recreation Survey

The following are all the <u>verbatim</u> comments written on the returned Open Space and Recreation Plan surveys from 2006. Many thanks to the Leslie and Joan in the Town Clerk's office for compiling them into digital form. "Q1" means Question 1 from the survey etc. All comments are listed below the section where they appeared on the survey.

Q1 – *<u>How important was each of the following in your decision to live in Shutesbury?</u>*

d. easy commuting
- I don't think it's easy.
- Not!
- Parts of town are not an easy commute.

e. Participatory government
- We like it.
- Expected then (1969)
- Not really. Autocratic Gov.

g. Perception of Community Values
- they were poor (1969)

j. Trails
- don't advertise. Private property

k. Access to Quabbin Land
- What access. Needs to be opened to public

m. Safety from crime and vandalism
- We've had crime and vandalism.
- We've had 2 break-ins!
- Huh! Where do you live?

n. Public school system
- no children
- too bad the elementary school has changed so drastically for the worse – no longer a draw.
- Amherst Regional

o. More affordable housing
- Housing more expensive here
- than what?
- Affordable housing is oxymoron.
- We don't have any.
- Rental-when we moved here in 1992

p. Recreational opportunities
- there aren't many

Other reasons (please list below)
- Healthy place for my kids to grow up
- There should have been a category btwn important & indifferent
- Place for dogs.

- Some distance from work.
- Good schools – small elementary with low ratio of students per teacher
- Lots were reasonably priced – not as rural as Wendell & New Salem
- elevation (cooler, snow)
- Lake Wyola
- Seasonal – great summer getaway
- Schools, primary and secondary, # 1 reason we moved here
- Wildlife/wildflowers, scenic character
- Low use of chemicals, fragrance free
- Low tax assessments
- The good reasons on this list are undermined by lack of community for those who don't have kids in school.
- Above things are true regionally.
- Average, ordinary people…..not just academics.
- Simple government, low taxes
- Less light pollution (astronomy)
- Open fields
- Few town employees.
- Aggressive thinking.
- X country skiing
- Access to other towns.
- Relation to Amherst Public Schools
- Proximity to Amherst
- Affordable land
- Colder, more snow, milder summers
- Lakefront opportunity, beauty – nature and people
- Lake Wyola
- Proximity to Amherst
- Cultural offering of valley
- Shutesbury as town (was unimportant)
- TV reception

Q2 – *How do you feel about protecting the following natural, historical and scenic resources in town?*

b. Dirt or gravel roads

- only if maintained
- we're on one

c. Historic cellar holes

- depends
- (?) x 1 (one question mark)

d. Historic buildings

- depends

k. The Old Town Hall

- Too much $ spent on it.

l. The Spear Memorial Library

- get rid of it and build something better

- new library facility is critical. Not enough info is available on options/what is needed for new uses of current building.
- This is a wonderful resource, but it needs to expand.

m. The Town Common
- keep it open

o. Scenic Views
- What views?

p. The "S-curves" as they are now.
- But make safety improvements.
- but more safety improvements
- safety is critical
- um, the "scenic" half of these are in Leverett
- (?) x 1 (one question mark)
- Safety hazard

s. Brown's Pond & wetland
- don't know what/where this is
- (?) x 8 (eight question mark comments)
- Not the public's business
- Private property

t. Roaring Brook
- (?) x 3 (three question mark comments)
- On the "S's"

u. Peace & Quiet
- dogs
- loud college student neighbors – rarely get peace and quiet though.
- Noise by-law needs to be respected at Lake Wyola, esp. spring, summer, fall blasts of firecrackers, fireworks, + cannon. Need permit for July 3rd, 9-10 pm only. Big tradition here and would be proper "outlet" for many folks once a year.

v. Absence of city lights
- Install dawn lights at hwy barn and top of hill to reduce light pollution.
- Great stars

Other (please list)
- Mountain bike trails
- environmentally conscious community
- Atkins Reservoir
- Wooded area around Atkins Reservoir
- wildflower, fern, mushroom habitat, clean aquifers/wells
- Pelham Hill road reduced.
- Well water quality

Q3 – *Where would you rather see future development occur?*

Along roadsides, to keep large tracts of back land undeveloped.

- but clustered
- Or the less development the better
- Supporting wildlife is contingent upon leaving contiguous tracts of forest intact.

Set back from the road, to keep the roadside view less developed.

- Cluster housing
- Native trees, mountain laurels, wildflowers

Other options – please list

- Grouped housing away from street that preserves open land is good.
- Depends – but definitely no more duplexes!
- Conservation subdivision
- Along roadsides in central thickly populated areas and set back in unpopulous locations.
- Along roadsides but with easy, obvious access to back lands
- Nowhere
- The town does not need more development.
- Very good question
- Combination- some on road but allow pork chop & back lots. Don't just cut off back lots to accomplish.
- Left to the discretion of the developer
- Would rather see dense pockets of development with large areas left untouched.
- A little bit of both?
- Cluster development keeping large tracts undeveloped & preserving more roadside view.
- Cluster around current development
- A mix of both of the above is necessary, depending on the area of town.
- Cluster housing off (set back) from the main roads. i.e., cul de sac neighborhoods
- A mix of the above.
- Reasonable setback/ businesses req. to build in character – all building plans reviewed to insure they fit w/ New England character (No "McDonald" standard structures)
- Combination of above, cluster housing
- Leverett road or West Pelham – near school
- The less development, the better
- Maybe a mix of both, on a case-by-case or area basis
- Limit development
- Cul de sacs w/ preserved land 'built in"
- Clustered development
- Cluster housing
- How about a balance
- What ruins a view along roads the most is electric/phone poles and clear cutting forest to create lawns. How about educational materials on the drawbacks of lawns, and benefits of lawn alternatives? Also, some roadsides look terrible because of road work, guardrails, ditches, brush cutting, logging. I enjoy driving by attractive homes and gardens just as much as forest.
- Clustered in a few locations, near roads
- Much depends upon ownership/access/ etc. But every site could be different depending upon resources.
- Clustered housing w/attached open space
- Along roadsides with setbacks from road; setback subdivisions where appropriate environmentally.

- Mixture of both
- None
- Clustered in small neighborhoods off main roads.
- Congregate housing
- It depends on what kind of development. Ex) Development of town buildings could be more visible versus housing could be more discreet.
- Town center
- Cluster housing, community gardens, lower income co-housing available
- A combination of the above – have development set back somewhat from the roads while limiting development of large tracts of back land.
- Cluster dev., min. setback near common.
- Some clustered housing can be set back just enough from road so as not to be seen (Old Orchard).
- Multiple homes sharing 1 driveway & setback
- Some of each but limited
- Perhaps a few well-planned new roads into "backlands". Modest homes & cluster housing: simple apt. units for singles, couples, small families, disabled elderly, low(er) income; hospice, mentally ill; small industry, etc.
- Town of Amherst
- Would like to see a development to create a broader tax base.
- Keep development down by increasing lot size to 3 acres. No advantage to town to increase development. Each kid costs $10,000.
- Landowner should be able to put house where they want.
- Within 1000 feet of present day roads
- No development
- Expand frontage requirement
- Anywhere the land owner wants, on his land, it's his, why tell him where he has to live.
- Sub divisions
- Housing concentrated with shared open space surrounding clusters of houses.

Q4 – *How often do you use the following open space and recreational resources in town?*

b. Lake Wyola State Park beach & facilities

- Walks on back side.
- 5 times in 20 years
- if smoking were prohibited and there were motorboat-free days this (*never using State Park, town beach, boat ramp*) would change!!!

c. Randall Rd Town Beach

- canoe and kayak
- (?) x 2 (two question mark comments)

e. Lake Wyola Association beaches

- What? Private property!

g. Powerline rights-of-way

- powerline is too messy for walking
- not anymore!

h. Abandoned roads

- private property (Again)

i. Trails on public lands
- x-country skiing

k. State forest land
- Don't know where it is?

l. Field behind town hall.
- never, but it's nice to look at
- did regularly when playground

o. Town Common
- walk on

p. Shutesbury Conservation lands
- Where are they?
- Not sure where they are.

q. M&M hiking trail
- Don't know where this is.
- (?) x 1 (one question mark)

Other places (please list below)
- You folks forgot about people who fish. (add) Rivers for Fishing
- Roads like Montague Rd & Pelham Hill for running…tend to use these things in spurts, i.e. swimming every other day for a month.
- Private beach (*Lake Wyola)*
- Lake Wyola Park trails
- quiet roads-cycling
- snowmobile trails
- All trails in Atkins area
- The cascades
- Ames Pond
- Lake + trails around
- Live on Lake Wyola
- Rattlesnake Gutter Rd. Horse trails private + public land
- Ice skating behind fire station

Q5 – *<u>What would encourage you to use these resources more often?</u>*

- Time (x3) (three of the same comments)
- knowing where trails or pub / priv.land are
- More dog friendly policies for use.
- More time (free time)
- Signs clarifying which spaces are open to the public
- More trails
- More time in the day. Get rid of standard time – daylight savings time year round.
- Locals have "closed" power line right-of-way west of Montague Road. It's unfriendly, of course, but can they even do this?
- Better information (on the web?). (Don't need to use them to value them)
- Less time at work!

- Information about them, cross-country skiing lessons
- Not of interest
- Knowledge of where the above listed trails/resources are. Less time at work!
- Knowing more about location, access, availability- don't want to trespass unknowingly.
- Information – access info, rte info
- Group activities, community events
- The AT&T right-of-way on the west side of Montague Road – parallel to Leverett Road- has been booby-trapped quite intentionally so people cannot walk or ski on it. Could this be looked into, please?
- More time in my personal schedule
- Knowing they exist for public use would help….never heard of Randall Beach for example.
- If biking and dogs were allowed @ Quabbin
- Maps and info.
- Longer days, retirement, no black flies, independent wealth, etc.
- Trails marked for e-z hiking.
- Already use the ones we like – more time to enjoy these would be nice
- Better access and public facilities
- Naturalist programs
- Maps describing rights of way and locations
- More free time, more physically able to
- Trail map, permission from private landowner, access to Quabbin for XC skiing
- More snow!
- Knowing more about them – don't know much about trails
- Proximity
- If I knew where they were…freedom from smoke/vehicle exhaust, easy handicapped parking spaces, parking, clear ice for winter skating.
- A map of the places one may hike in town.
- Knowledge about them
- Trail maintenance to circumvent/remove vast mud-pits left by logging skidders.
- nothing
- town maps, www info
- better knee joints
- more time
- Marked trails, maps of open/public areas
- More free time!
- Having a friend in town to go with.
- Knowing where they are and having parking area available.
- If I had more time.
- Publication of location of trails, conservation lands and type of usage.
- Trails near streams or lakes away from traffic.
- Map of trails (public & open to public private trails)
- Develop a well drained baseball/softball field behind fire station.
- More free time mainly, but also not feeling like I'm trespassing on private land and smaller crowds at the State park and beach.
- Improvement of playground + fields, limit snowmobile use to some public trails but not all
- Better parking; maps
- Free parking
- I'm not interested.
- Walking on dirt roads – daily

- Information about them; maps, schedules, availability, a boat!
- Being younger
- Mark trails/land
- Organized activities: hiking clubs, bird watching org., etc.
- Maps
- Younger age
- I don't need public land as I have enough of my own.
- Too old
- Less population
- Being 30 years younger – back then used often
- Longer summers!

Q6 – *Which of the recreational opportunities below would you like to see developed in town?*

a. Soccer fields
- exist
- 1 'good' soccer field and playing field.

b. Ice skating rink
- outdoor?
- would prefer safe lake area
- outdoor (x2) (two of the same comments)
- at Lake Wyola

c. Tennis courts
- tennis courts behind town hall.

d. Basketball court
- exists
- basketball court for teenagers

e. Public mountain bike trails
- very low priority
- Insurance cost?

f. public nature/hiking trails
- doesn't the State Forest have these (*f & g)* already at State Beach?

g. public cross-country skiing trails
- Am an avid walker, skier, mtn biker, but we don't need more trails "developed".
- X country ski trails with no snowmobiles or all terrain vehicles.

h. Handicapped accessible areas at Lake Wyola
- exist
- already accessible
- isn't the state beach already accessible?

l. Improved all- purpose playing field
- exists

n. New playground
- exists

- besides the school one??
- w/library behind Town Hall
- eco-safe
- non-toxic materials
- again!

o. Community gathering place

- Coffee shop/ bakery near post office
- in new library
- highest
- something like Wendell General Store
- New Library!
- If it is safe. Town Common is <u>not</u> safe.

Other (please list)

- What happened with the design plan done in 2002 by Conway School of Landscape Design student?
- These are all great ideas.
- Carver Rd and other places are very accessible
- Cable access
- Public snowmobile trails
- Just leave everything the way it is. No tax dollars for recreation.
- High speed wireless internet access – cell phone service
- Have no personal opinion about others as we would not use these resources. *(Public nature/hiking trails)* and *(Public cross-country skiing trails)* are fairly low cost / could be maintained by volunteers & used by many people. Cause low impact to the env. & can be educational as well can be signed for env value)
- We like Shutesbury pretty much as it is-
- No tax monies for above!
- Fast internet!!
- New library
- (*I – P)* Proximity to Amherst should not require a small town to provide such things.
- ATV trails
- …..safe trail or sidewalk/bike land between school and common
- focus fields for sports in Amherst, maintain unbroken forests in Shutes., purchase the Jones Cowls land.
- Winter access to school gym for family night, diff age groups, etc.
- Library, sidewalks or shoulders on roads that make walking safer
- Community walks/hikes
- A nice town swimming area
- Baseball/softball field behind fire station
- Recreational opportunities that could benefit the greatest number of people and cannot be found elsewhere (or don't already exist) are the most important in town.
- Paved area for in-line skating and skateboarding
- No opinion here, but high priority for families w/children-teens needs. Indoor space for dance, yoga, aerobics, jazzercise, low-cost classes for health, fun, recreation.
- Renovation and community center of the Lake Wyola Park house.
- Horse riding trails

Q7 ***– Are there specific natural/historical/archaeological areas in Shutesbury that the Town should try to acquire, protect access to, or otherwise protect?***

- Lake Wyola public users should pay to use/park boat ramp. These users impact greatly on water quality and charging a fee for use could offset rehabilitation efforts.
- Paint town hall a nicer color, fix church steeple – it's leaning, make town center area look more appealing – planting of trees and shrubs in front of town hall, get rid of the circular drive in front.
- Verifiable sites related to Daniel Shays
- Beehive caves and other areas of archaeological interest
- Banfield APR Land-periodic logging creates havoc, not managed in a friendly, neighborly way.
- Brushy Mtn. corridor, Old Town Rd/ Silvermine Rd, Roaring brook
- The schoolhouse on Schoolhouse Rd. perhaps?
- Protect the town from sprawl-type development by changing the zoning rules.
- Not familiar with these yet.
- Clean water: Lake Wyola, ground water, etc.
- Southbrook Conservation area – enforce no ATV's – wrecking trails – gates? needed
- Town Hall should not be a house!!
- Reed Road from West Pelham Rd to Pratt Corner Rd – acquire for hiking, etc.
- Town center, Temenos, Atkins Reservoir
- Air quality, water quality, peace & quiet, darkness at night
- All stone walls; they are historical and provide good wildlife habitat - old gravesites within reason – all older, old growth groves/trees
- Brushy Mtn.
- Private-owned land that would better protect Atkins Reservoir. Private-owned land that would better protect perennial streams in town.
- Wooded areas around Atkins Res.
- Animal pound, beehives
- Mature forest with old growth characteristics (mostly on Quabbin Land)
- Old village site – Briggs Road? Other old stone structures, etc. historic buildings, regardless of condition until they can be repaired (such as old house on lot O32)
- Junket Rd foundations, wells, charcoal ovens, beaver ponds, streams, views, amphibian habitat. The s-curves natural beauty – no power lines, no straightening, keeping streams – same w. Prescott Rd. The area around Lake Wyola/Temenos
- Beaver ponds on junkette rd
- Town should promote the preservation of open fields.
- Roaring Brook, Dean Brook
- Beehive caves
- Mineral mountain area, (Jenson Rd), monks caves, wetlands
- All of the Jones land
- Tract of land on west side of Montague Rd.
- Lake Wyola
- Extend land around our recent purchase of the Taylor property.
- Wetlands throughout Town
- Brown's "pond" area
- Cowles land off Montague Rd to preserve trails.
- I would like a trail beside a lake or stream.
- Conduct a cellar hole, monk cave inventory map

- All stoneworks – walls, wells, foundations, etc. are historic treasures that define New England.
- Large tracts of State and Shutesbury forest.
- Old Town Hall – more access and use of
- Protect the few open fields left in town
- Certain stretches of undeveloped road frontage
- Carver Rd – no access to motorized vehicles other than snowmobiles
- Protect as much as possible!
- The schoolhouse @ corner of Baker + Schoolhouse roads
- Old growth forests
- Old growth forests if any exist
- Lake Wyola should be kept and protected.
- All watershed areas – streams, culverts, rivers, Lake Wyola / Quabbin watershed
- My place –Janowitz
- Don't know! Keep all open spaces.
- Less water for the Quabbin. Less water for the Town of Amherst.
- Cellar holes & house foundations
- Archaeological sites
- No. We had what is now Shutesbury State Forest sold it for next to nothing and the State sold the timber for a large sum. Don't waste any more tax payers hard earnt money.
- NO
- High bridge
- Ames pond and stone culvert under Old Wendell Rd.

Q8 – ***Public use of trails on private property is at the discretion of the private property owner, who can withdraw their permission at any time. Types of activities allowed on public land are determined by the public agency which owns or manages it, including conservation and watershed land. With this in mind, what activities do you support or oppose on public land or your land in town?***

b. Horseback riding

- on roads difficult

c. Mountain Biking

- limit trails
- no way

f. Snowmobiling

- Some trails are open to it, some not
- No way
- Limit trails
- Destructive to habitat

g. All Terrain Vehicle use

- no! (2)
- No way
- they ruin the trails and create erosion
- never!!
- if done responsibly, possibly. The trails are very chewed up right now.
- Destructive to habitat

h. Other motorized vehicles

- like what?
- *(oppose)* unless trail etiquette is encouraged, then *(support)*
- No way!
- Destructive to habitat
- *(Snowmobiling, ATV use, Other motorized vehicles)* must be restricted to certain trails and roads so hikers and skiers have separate space.
- Please – NO one crossing our lot
- hunting
- This is hugely confusing – is it for landowners? What "public" land? DCR, MDC, town, Amherst? Good luck analyzing this one – it is way too ambiguous.
- Oppose all use of motorized vehicles on trails, public land.
- No one should use land not theirs.

Q9 – Have you personally experienced problems with motorized vehicles on trails in town? Yes or No

- ATV's destroy trails. Posted etiquette could never stop this. Snowmobiles are noisy but do not cause damage.
- Not directly (or personally), but the trails are in rough shape. Wet fall and ATV use left deep ruts.
- But in my hometown, ATV's took over & greatly damaged the terrain.
- String of jeeps heading from trails off Sand Hill Rd.
- ATV's have plowed up wetlands near our place
- Motorcycle
- ATV's in Southbrook
- ATV's
- No, and I don't want to!
- Years ago
- This question is unfairly biased. If someone answers "yes", does that mean once in the last 5 years, once a year, once a week? Responses to this question will create a distorted picture of reality…This question is as "loaded" as asking "Have you ever had a problem with (*can't read (# 76)*)? Have you ever had a problem with the ConCom?"
- My daughter and I were almost run over by rude snowmobilers.
- I like the way they open up snowy trails to hikers and dog walkers.
- Most people are quite courteous but a few are quite rude & dangerous.

Q10 *– The Town acquired the property Lot O32 across from the Highway Department on Leverett Road last year for future municipal use. How do you think it should be used?*

a. New library complex

- It would be nice if the library could stay on the common, but if this is the only available space then yes! New library please.
- a good location
- if needed
- It is a high priority and should be attached to the Town Hall
- Put behind town hall
- Depending on needs of our community
- Silly, unnecessary. Every town doesn't need library-with the Jones & the Leverett library.

b. New highway, police, or fire station building

- Police need something.
- don't think this is necessary
- Fire station greatest need
- Depending on needs of our community
- If needed

c. Athletic fields

- Don't we have enough athletic fields already?
- Behind town hall
- You need to look at all the other options

d. Conservation land

- Until future uses are clearly known for the long term, such as additional school space – the current school can not be expanded – we were told when the addition was completed.
- In rear

Other (Please list):

- Recreation Center. I think it should be a facility that can create revenue for the town.
- Why not create library behind Town Hall?
- Store/community ctr
- Energy park
- Community space- all we have is the Shutesbury AC-smoky and unsuitable for children
- Biodiesel station
- Skate park/ snowmobile + BMX raceway
- new school – turn the existing school into library/senior center/town hall/ community building
- tennis court
- police station
- Community center maybe?
- A town farm w/ greenhouses
- Tower for high-speed internet access
- Community gathering, play, picnic
- school (future)
- save or move old library building
- Low income residences for elderly Shutesbury Citizens and for the chemically sensitive – State funded
- Open to all of these
- This is so hard to answer. I don't know anything about the issue.
- Skating rink
- Senior housing
- Teen center combined with community center
- Limited commercial use – store/coffee shop
- In-town housing
- Retail
- Low income housing/apts./condos, half-way house for ill, homeless, respite care, etc. To explore w/community support
- New Town Hall to include offices for police & library & senior center
- If you take a good look at it in the spring you may realize the only thing it is appropriate for is cows.

- Would be better used as a sub division. More tax revenue. No use because you paid too much for this land – worth only 50,000 not 212,000

Q11 – *What interesting wildlife have you seen, or seen signs of in town in the past few years?*

- Weasel
- otter (river
- Turtles(painted)
- Fox
- Many deer
- Porcupine
- Skunk
- I didn't know eagles lived this far south!
- Barred owl
- red fox
- gray tree frogs
- Osprey
- Broad winged hawk
- spotted salamander
- Amazingly all of these I've seen within 2 feet or less of my home, always reminding me how "special" this place is.
- Pileated woodpecker
- Opossum
- turkey vulture
- snapping turtle
- raccoon
- Bear is the only I haven't actually seen
- Red squirrel
- ruffed grouse
- sharpshinned hawks
- Many kinds of birds & fish
- Blue heron
- Snowy owl
- We live downstream from Lake Wyola w/ stream in front yard – good view. Participate in "Project Feeder Watch" and record all birds each year. Just listed most interesting ones…northern grosbeak, wood ducks, black ducks, northern snow-whet owl, woodcock.
- Mink
- River otters
- Scarlet tanagers
- Big Foot
- Raven
- Sharp tail grouse
- Black squirrel
- Canadian geese
- Red tailed hawk

Q16 – *Please circle phrase that best describes your housing situation.*

- Landowner for 3 years. Building Residence this year.

Additional Comments

PLEASE get the snowmobiles off Lake Wyola. It's like having a highway in the middle of a playground. I feel my family and I are denied access to the lake because of the snowmobiles. They go so fast and I worry about getting hit. Thank you.

There is practically no areas that encourage dog owners to bring their dogs/ are dog friendly. Perhaps you could allow dogs at certain times only & also provide a dog-doo bag dispenser so owners can clean up after their dogs with ease.

I have trails that many people use on my property. We don't mind the use, but many people go off the trail. We will close the trail if people keep going off it.

Thank you for working on this plan and for seeking input! Carry on!

We should be restricting new development as much as possible, combined with aggressive measures to subsidize and eliminate totally any negative effects for more residents, seniors, and anyone else who is harmed by such restrictions. Thank You!!

These questions alone show me how lucky we are to have such thoughtful insights and ideas generated to protect our environment. (the air, the water, the soil, the animals, and yes, the people) Thank you for your continued interest and action. You're doing a wonderful job!

Open recreational space is important and so is leaving the door open to development later. Zoning out future development is not the answer.

I appreciate conserving land in Shutesbury. I appreciate living industry free. I would be willing to donate my time to develop recreation, etc. lands. Please do not raise my taxes for these projects. Taxes are high already.

As we own on Lake Wyola, we obviously are very concerned about water quality, specifically weed control.

Thanks for volunteering your time and doing what you are doing.

1. Hook up w/ Morse Hill to get more kids outdoors – build skills
- run programs thru elem. School, town rec, summer camp opportunities
2. Shutesbury talent show/ open mike ---beat the winter blues and uncover town talent
3. summer concerts/coffee houses – local acts

If future subdivisions are ever approved, I feel that developers should be required to build roads to the standard required for town acceptance – i.e. Town would maintain them. Private roads are disastrous for neighborhoods.

Thank you for volunteering to do this important work!

I feel this survey is fairly neutral in tone, that is the questions are not too leading in one direction or another. However, I also feel it should be used as a general guide, and not necessarily a call to specific action. Most of Shutesbury's infrastructure is not in real good shape, therefore improving what we have, rather than add to it, should be a priority.

Unfortunately, this survey doesn't get at the central looming issue that confronts Shutesbury's long-term trajectory. A single landowner, the largest in the state and a real-estate development

company, owns a massive amount of the back land (and especially formerly frontage). This fact and the issues that it raises should be openly discussed and confronted. Most of the issues raised here will be moot if that single owner plays its cards the way they would like.

You are doing great work – thank you

Not only is it unpleasant to encounter all terrain vehicles and snowmobiles on trail, smell their exhaust and hear their noise, but every year they keep widening the trails and ripping up soil, leaving a muddy mess.

Thank you for asking.

The appeal of Shutesbury is its rural character and low density of population and buildings. Shutesbury has a trove of historic stoneworks from the 18th and 19th centuries that should be preserved. Shutesbury's focus on land use should be to retain its rural character. All the amenities of life – retail and cultural- are within a 30- minute drive. There's no compelling reason to provide any of this in town; we don't need to duplicate what's available nearby.

Thank you for considering all of us! In answering question #1, I realized the reasons I came to live in Shutesbury (primarily the elementary school) are not necessarily why we chose to stay and ultimately buy a home. (Reasons) are particularly important to me as I have some chemical sensitivities.

Thank you for this good work! Although our original reason (other than the rural setting) for choosing Shutesbury was the well known progressive elementary school, now that our kids are grown it is friends and community and history that keep us here. My major long term concern is whether or not we can continue to afford to live here, i.e. property tax levels.

Thank you. Fine job!

Two safety issues concern us. Wendell Road – too narrow- headed north, the right hand side of the road washes out – we have helped many older folks & women get out of the shoulder due to water. Cell phone tower – they can be attractive or not intrusive. Maybe the town could receive the income from it. We have telephone poles which are very ugly. When the power goes out or in a car it is now a safety issue – especially for handicapped or seniors.

This is a free country, you are suppose to have the freedom to own land and do what you want with it.

Appendix D: Shutesbury 2006 Open Space and Recreation Survey Results

Shutesbury 2006 Open Space and Recreation Survey Results

Background Information: This survey was sent to each Shutesbury household (total of 549) in January 2006 with a request for replies by March 1, 2006. The objective of this survey was to gather information to assist the preparation of an updated Shutesbury Open Space and Recreation Plan. A total of 185 responses were received representing a 33% response rate. It is expected that this Survey information will also be useful to other town committees. For the sake of this survey, "**Open Space**" was defined as*:"undeveloped land (fields, forests and wetlands) with particular conservation, recreation or scenic interest."*

In addition, numerous written comments were received and are included as Appendix C. It is recommended that these written comments be reviewed in addition to the numerical information. A copy of the original survey is included as Appendix B.

Respondents provided their views based on the following numerical indicators:

- 1 = very important
- 2 =important
- 3 = indifferent
- 4 = unimportant
- 5 = very unimportant

The numerical scores are the average "mean" scores for each question. The results mirror the questions asked as well as their sequence in the survey. Since the response rate varied per question, the average response rate is indicated.

As an example, 176 people may have responded to a question. The total of their preference scores (1-5) is divided by 176 in order to indicate the average or "mean". For this reason, the response rate is also shown per question as a percentage.

Generalized Summary of Results:

- Similar to the town's first Open Space Plan which covered the period from 1980-1985, the survey results indicate that the town's low density rural character, together with its forests, wetlands, clean air and water, and tree-lined streets were important factors in deciding to live in Shutesbury.

- Protection of these natural resources ranked high among the respondents with consideration for wildlife habitat, hiking trails and scenic views as features to merit continued protection.
- Despite the vast expanse of State protected lands buffering the Quabbin Reservoir, both use of these areas and the availability of these lands as a factor for residing in Shutesbury was less important.
- Question #2 listed 24 town features for respondents to designate as priorities for protection in town. Although there are various categories listed under this question (e.g., specific locations, historic structures and general environmental conditions), the answers suggest a higher priority for maintaining general healthy environmental indicators (e.g., clean air) than for specific structures or geographic sites. The variance in the "mean" responses, however, is not numerically large and many of the 24 features are not mutually exclusive.
- Recreational use occurs more frequently on trails in non-populated areas with less activity on town owned lands that are "open" in nature (e.g., town common).
- Among future additional recreational features, respondents favored additional trails as well as a community center.
- Question #8 indicated a series of preferences for recreational activities on respondents' lands, public land and posted trails. A preference was indicated for passive recreational activities such as hiking and x-county skiing versus motorized vehicle use.
- Respondents to Question #8 indicated a greater willingness to allowing hiking or x-country skiing on private lands in strong contrast to concerns about motorized vehicle uses – even on public lands.
- Priority for use of the newly acquired town lands across from the Highway Department favored its use as a new town library.

<u>Question #1:</u> How important was each of the following in your decision to live in Shutesbury?

1 = VERY IMPORTANT, 2= IMPORTANT, 3= INDIFFERENT, 4 = UNIMPORTANT, AND 5 = VERY UNIMPORTANT

The **mean score** listed below represents the average of the total numerical scores divided by the numbers of respondents. In addition, the scores are listed from highest to lowest among preferences expressed by the responses. Since 1 represents "very important" and 5 represents "very unimportant", a score between the range of 1.0 – 2.9 represents a higher degree of interest by the respondents rather than a score of 3.0 – 5.0, which represent "indifferent" and "very unimportant," respectively. The sequence

corresponds to the numerical hierarchy of the respondents' preferences by listing the scores in a range that reflects from "very important" to "very unimportant".

Average Response Rate for Question #1 = 96%

Peace and Quiet – Mean = 1.27

Forests – Mean = 1.27

Rural or Small Town Character – Mean = 1.33

Air/Water Quality – Mean = 1.38

Trails – Mean = 1.53

Lower Housing Densities – Mean = 1.66

Safety from Crime and Vandalism – Mean = 1.68

Recreational Opportunities – Mean = 1.95

Public School System – Mean = 2.07

Perception of Community Values – Mean = 2.09

Proximity to Area Colleges – Mean = 2.25

Access to Quabbin Land – Mean = 2.36

Participatory Government – Mean = 2.52

More Affordable Housing – Mean = 2.54

Easy Commuting – Mean = 2.59

Friends or Relatives Here – Mean = 2.88

Question #2: How do you feel about protecting the following natural, historical and scenic resources in town? *(Please see question #1 for an explanation of both the numerical options for respondents and the mean numerical score.)*

Average Response Rate for Question #2 = 97%

Clean Air – Mean = 1.19

Peace and Quiet – Mean = 1.25

Habitat for Wildlife – Mean = 1.39

Tree-lined Country Roads – Mean = 1.42

Walking and Hiking Trails – Mean = 1.43

Large Areas of Forest – Mean = 1.44

Scenic Views – Mean = 1.51

Absence of City Lights – Mean = 1.53

Open Fields – Mean = 1.54

Clean Streams and Water Bodies – Mean = 1.56

Roaring Brook – Mean = 1.63

Wetlands – Mean = 1.65

Lake Wyola – Mean = 1.69

Old Stone Walls – Mean = 1.77

Old Structures – Mean = 1.82

Town Common – Mean = 1.86

Historic Buildings – Mean = 1.92

Brown's Pond and Wetland – Mean = 2.04

Spear Library – Mean = 2.10

Old Town Hall – Mean = 2.16

Dirt or Gravel Roads – Mean = 2.21

Historic Cellar Roads – Mean = 2.33

Church on Common – Mean = 2.34

"S Curves" = 2.57

Question #3: Where would you rather see future development occur? *(responses to "Other Options" below appear as part of the written comments in Appendix C)*

Along Roadsides, to keep large tracts of back land undeveloped – 46 positive responses

Set back from the road, to keep the roadside view less developed – 78 positive responses

Other Options – 43 responses

Of the preferences listed, there were no responses from 38 of the households – as a result, the response rate was 90% for this question.

<u>Question #4:</u> How often do you use the following open space and recreational resources in town? *(Please see question #1 for an explanation of both the numerical options for respondents and the mean numerical score.)*

1= Weekly, 2= monthly, 3 = seasonally, 4= annually, 5= never

Average Response Rate = 95%

Trails on Public Lands – Mean = 2.48

Trails on Private Lands – Mean = 2.52

Abandoned Roads – Mean = 2.81

State Forest Land – Mean = 3.02

Shutesbury Conservation Lands – Mean = 3.25

Lake Wyola State Beach – Mean = 3.32

Quabbin Reservoir lands – mean = 3.33

M&M Hiking Trail – Mean = 3.41

Power line Rights of Way – Mean = 3.79

Atkins Reservoir Lands – Mean = 3.85

Town Common – Mean = 3.86

Elementary School Playground and Fields – Mean = 4.01

Boat Ramp – Mean = 4.15

Randall Road Town Beach – Mean = 4.17

Lake Wyola Association Beaches – Mean = 4.22

Field Behind Town Hall – Mean = 4.59

Field Behind Fire Station – Mean = 4.62

<u>Question #5:</u> What would encourage you to use these resources more often?

Answers to this question appear as written responses in the attached comments.

<u>Question #6:</u> Which of the recreational opportunities below would you like to see developed in town? Please consider that town committees, run by volunteers, would do the work and that improvements to land would have to be funded by grants and or taxes?

(Please see question #1 for an explanation of both the numerical options for respondents and the mean numerical score.)

Average Response Rate = 93%

Public Nature Hiking Trails – Mean = 1.65

Public X-Country Ski Trails – Mean = 1.71

Community Gathering Place – Mean = 1.96

Handicapped Accessible Sites at Lake Wyola – Mean = 2.02

Improved All-purpose Playing Field – Mean = 2.06

Programs for Teens – Mean = 2.09

Recreational Programs for Seniors – Mean = 2.09

Community Concerts/dances/movies – Mean = 2.12

Accessible Trail Behind Town Hall – Mean = 2.26

Ice Skating Rink – Mean = 2.34

New Playground – Mean = 2.38

Soccer Fields – Mean = 2.38

Public Mountain Bike Trails – Mean = 2.41

Basketball Court – Mean = 2.43

Tennis Courts – Mean = 2.50

Question #7: Are there specific natural/historical/archaeological areas in Shutesbury that the Town should try to acquire, protect access to, or otherwise protect?

Answers to this question appear as responses in the attached comments.

Question #8: Public use of trails on private property is at the discretion of the private property owner, who can withdraw their permission at any time. Types of activities allowed on public land are determined by the public agency that owns or manages it, including conservation and watershed land. With this in mind, what activities do you support or oppose on public land or your land in town?

1= Support, 2 = neutral, 3 = oppose

Hiking,walking, running	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 73% response rate	66 responses	29 responses	38 responses
If trails are on public land and roads only – 89% response rate	147 responses	12 responses	3 responses
If trails are posted with trail standards and encouraged trail etiquette – 86% response rate	137 responses	14 responses	6 responses
Horseback Riding	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 88% response rate	61 responses	40 responses	60 responses
If trails are on public land and roads only – 86% response rate	123 responses	29 responses	6 responses
If trails are posted with trail standards and encouraged trail etiquette – 84% response rate	116 responses	33 responses	5 responses
Mountain Biking	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 88% response rate	33 responses	37 responses	92 responses
If trails are on public land and roads only – 87% response rate	94 responses	41 responses	24 responses
If trails are posted with trail standards and encouraged trail etiquette – 84% response rate	96 responses	38 responses	19 responses
Snow-shoeing	**Support**	**Neutral**	**Oppose**
If trails crossed your land - 88% response rate	99 responses	29 responses	34 responses

If trails are on public land and roads – 72% response rate	115 responses	16 responses	3
If trails are posted with trail standards and encouraged trail etiquette – 85% response rate	136 responses	14 responses	6 responses
Cross-Country Skiing	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 88% response rate	101 responses	29 responses	32 responses
If trails are on public land and roads – 85% response rate	139 responses	13 responses	4 responses
If trails are posted with trail standards and encouraged trail etiquette – 84% response rate	134 responses	14 responses	6 responses
Snowmobiling	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 90% response rate	9 responses	12 responses	144 responses
If trails are on public land and roads—87% response rate	38 responses	39 responses	82 responses
If trails are posted with trail standards and encouraged trail etiquette – 83% response rate	44 responses	37 responses	70 responses
All Terrain Vehicle Use	**Support**	**Neutral**	**Oppose**
If trails crossed your land – 89% response rate	5 responses	5 responses	156 responses
If trails are on public land only – 77% response rate	4 responses	27 responses	110 responses
If trails are posted with trail standards and encouraged trail etiquette—86% response rate	32 responses	23 responses	102 responses
Other Motorized Vehicles	**Support**	**Neutral**	**Oppose**

If trails crossed your land – 88% response rate	3 responses	3 responses	156 responses
If trails are on public lands only – 86% response rate	18 responses	23 responses	116 responses
If trails are posted with trail standards and encouraged etiquette -- 83% response rate	25 responses	25 responses	102 responses

Question #9: Have you personally experienced problems with motorized vehicles on trails in town?

Response rate = 72%

Yes: 60 (33%)
No: 73 (40%)
No Reply: 51 (27%)

Question #10: The Town acquired the property Lot 032 across from the Highway Department on Leverett Road last year for future municipal use. How do you think it should be used?

	Yes	Uncertain	No
New Library Complex—88% response rate	92 responses	36 responses	34 responses
New highway, police or fire station bldg -- 73% response rate	51 responses	66 responses	36 responses
Athletic Fields – 84% response rate	51 responses	69 responses	36 responses
Conservation Land – 82% response rate	72 responses	56 responses	23 responses
Other—7% response rate	14 responses		

Question #11: What interesting wildlife have you seen, or seen signs of in town in the past few years?

Wild Turkey – 154 positive responses
Moose – 109 positive responses

Coyote – 98 positive responses
Bear – 96 positive responses
Beaver – 91 positive responses
Eagle – 78 positive responses
Great-horned owl – 58 positive responses
Fisher – 53 positive responses
Bobcat – 45 positive responses
Wood Turtle – 35 positive responses
Snowshoe Hare – 31 positive responses
Mountain Lion – 6 positive responses

Completion of Questions #12 - #17 was optional and elicited fewer responses.

Question #12: What part of town do you live in?

Lake Wyola Area – 32 positive responses
West Pelham Road Area – 26 positive responses
Wendell & Locks Pond Roads Area – 17 positive responses
Montague Road Area – 17 positive responses
Leverett Road Area – 15 positive responses
Baker and Schoolhouse Road Area – 14 positive responses
Sand Hill & Pratt Corner Roads Area – 12 positive responses
Atkins Reservoir Area – 11 positive responses
Pelham Hill Road Area – 9 positive responses
Town Center Area – 5 positive responses
Cooleyville Road Area – 5 positive responses
Leonard Road Area – 2 responses

Question #13: What is your age?

45 – 64 years of age – 102 positive responses
20 – 44 years of age – 44 positive responses
65 – 78 years of age – 20 positive responses
79 years of age and older – 4 positive responses
19 years or younger – no positive responses

Question #14: How many years have you lived in Shutesbury?

6 to 14 years – 50 positive responses
15 to 24 years – 43 positive responses
25 to 49 years – 36 positive responses
Less than 5 years – 31 positive responses
50 years or more – 4 positive responses
I am a native, I was born here – no positive responses

Question #15: How many people are in your household?

2 people – 60 positive responses
4 people – 36 positive responses
3 people – 34 positive responses
1 person – 20 positive responses
5 people – 10 positive responses
6 or more people – 3 positive responses

Question #16: Please circle that phrase that best describes your housing situation.

Year-round Resident (property owner) – 155 positive responses
Seasonal Resident (property owner) – 6 positive responses
Renter – 6 positive responses
Other – 2 positive responses

Question #17: If you own property in town, how many acres?

Less than 3 acres – 82 positive responses
3- 9 acres – 52 positive responses
10 – 49 acres – 24 positive responses
50 – 99 acres – 3 positive responses
Greater than 100 acres -- no positive responses
I do not own property in town -- no positive responses

End of Survey

Appendix E: Detailed Inventory of Protected and Unprotected Lands of Conservation and Recreation Interest

Table E-1. Open Space Parcels Permanently-Protected from Development				
PERMANENTLY-PROTECTED PUBLIC LAND				
Ownership Status	**Owner**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Publicly-Owned	**Commonwealth of Massachusetts, Department of Conservation and Recreation Division of State Parks & Recreation (DSPR)**			
	Shutesbury State Forest	L	2	15.5
		M	33-37, 41	125.8
		N	23,51,61,62, 66-69	587.0
		Subtotal		***728.3***
	Carroll A. Holmes Recreation Area	B	648	0.1
		C	5, 9, 11	41.3
		Subtotal		***41.4***
	Lake Wyola Great Pond land under water	B	803	57.5
	Total Acres DCR/DSPR Land			**827.2**
Publicly-Owned	**Commonwealth of Massachusetts, Department of Conservation and Recreation Division of Water Supply Protection (DWSP)**			
	Quabbin Reservoir Watershed Land	J	1, 2, 4-7	187.7
		K	1-7, 10, 12-16, 21	338.5
		L	1, 2 ,4-8,10-14, 23-27	656.4
		M	17, 19, 21, 31,32, 38	147.0
		N	6-15,18-22, 25-33, 35-50, 52-58, 63, 64, 74,75, 88	4009.9
		P	6	16.0
	Total DCR/DWSP Lands			**5355.5**
	Total DCR Lands			**6182.7**
Publicly-Owned	**Town of Shutesbury, Conservation Commission (Manager)**			
	Garbiel Gift, Cove Rd (Individual Z lot parcels: B293, 305, 306, 315, 341)	ZB	293	1.4

Table E-1. Open Space Parcels Permanently-Protected from Development (Cont.)				
PERMANENTLY-PROTECTED PUBLIC LAND (Cont.)				
Ownership Status	**Owner**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Publicly-Owned	Lake Wyola Island, Merrill Dr (Individual Z lot parcels: B679 ,698, 699)	ZB	679	0.6
	Lake Wyola Conservation Area, Randall Rd	B	800	47.8
	South Brook Conservation Area, Locks Pond Rd	E	3	49.2
	Montague Road Lot	F	49	3.1
	Mt. Mineral Road Lot	J	3	1.7
	Haskins Meadow, Amherst Line	X	7, 34	31.1
	Subtotal			***134.9***
	Lake Wyola land under water and dam area	A	49, 51-54	6.0
		B	801, 805, 817	246.0
	Total Shutesbury Conservation Commission Land & Water			**386.9**
	Town of Amherst Conservation Commission (Manager)			
	Bob & Peggy Gage Conservation Area (Individual Z lot parcels: U9, 12)	ZU	9	187.8
	Houston Conservation Area (Individual Z lot parcels: U13, 44)	ZU	13	67.4
	Total Amherst Conservation Commission Land			**255.2**
	Total Shutesbury & Amherst Conservation Land & Water			**642.1**
TOTAL PUBLICLY-OWNED, PERMANENTLY-PROTECTED LANDS				**6824.8**
PERMANENTLY-PROTECTED PRIVATE LAND				
Ownership Status	**Owner**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Non-Profit	Connecticut River Watershed Council	I	2	1.6

Table E-1. Open Space Parcels Permanently-Protected from Development (Cont.)				
PERMANENTLY-PROTECTED PRIVATE LAND (Cont.)				
Ownership Status	**Owner**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Privately-Owned	**Agricultural Preservation Restriction**			
	Poverty Mountain Farm LLC (Owner), DFA (Holder of CR)	V	5 (partial)	34.0
	Conservation Restrictions (CRs)			
	Old Peach Orchard Homeowners Association (Owner), Conservation Commission (Holder of CR)	D	32,33,78, 79,98	27.7
	McNeil (formerly Kohl) (Owner), Conservation Commission (Holder of CR)	D	95 (part)	1.5
	Footit (Owner), DCRS[1] (Holder of CR)	E	2	236.1
	Janowitz (Owner), DCRS[1] (Holder of CR)	K	23, 26	135.0
	"Baker Fields" Pearson (formerly Groves) (Owner), Conservation Commission & The Kestrel Trust (Holders of CR)	Q	20, 75	7.3
	Mauri (formerly Levinger) (Owner), DCR (Holder of CR) (Individual Z lot parcels: K27, 28, 32)	ZK	28	205.3
	"Brushy Mountain" W.D. Cowls, Inc. (Owner), DFG (Holder of CR) (Individual Z lot parcels: F24, 25, 100-102, 116-124 & parts of F15, 17, 53 & 103) (Individual Z lot parcels: F18, 19 & 20) (Individual Z lot parcels: F32, 37-41, 126-129)	ZF ZF ZF F	15 18 32 30	247 232 121 (600 total)
	Conservation Easement			
	Robert Frost Trail through Poverty Mountain Farm LLC (Owner), DCR (Holder of CR)	V	5 (partial)	16.7 (estimate)
	Watershed Preservation Restriction			
	Dale (Owner), DCRW[2] (Holder of CR)(Individual Z lot parcels: K8, 9, 36, 119)	ZK	9	18.0

Table E-1. Open Space Parcels Permanently-Protected from Development (Cont.)	
PERMANENTLY-PROTECTED PRIVATE LAND (Cont.)	
TOTAL PRIVATELY-OWNED, PERMANENTLY-PROTECTED LAND	**1283.2**
TOTAL PERMANENTLY-PROTECTED LAND	**8108**

[1]DCRS – Mass. Department of Conservation & Recreation – State Parks
[2]DCRW – Mass. Department of Conservation & Recreation – Office of Watershed Management

(Source: Town of Shutesbury Assessors Records on CD; December 2009, with some changes based on deeds, MassGIS data and Town of Amherst 2010 data.)

Table E-2 (that follows) shows additional information concerning the permanently-protected public land in Shutesbury that could not be in included in Table E-1. For each property, the table lists the conservation agency responsible for managing the property, the current use(s), property condition, availability of public access, types of recreational opportunities currently available, funding sources used to purchase or otherwise obtain the property, and applicable zoning district.

Table E-2 Information on Town-owned Conservation Lands

Name & Location	Manager	Current Use	Condition	Public Access	Recreation	Funding	Zoning
Garbiel Gift, Cove Rd.	SCC*	Passive Recreation	Good	Available, but no parking	Picnic area, small boat launch	Gift	LW*
Lake Wyola Island & land, Merrill Dr.	SCC*	Passive Recreation	Good	Available	Picnic area, small boat launch	Town Purchase	LW*
Lake Wyola Conservation Area, Randall Rd.	SCC*	Passive Recreation	Fair-Good	Available and consisting of public boat ramp & parking	Trails, beach, boat ramp, fishing	SHG*	RR* & FC*
South Brook Conservation Area, Locks Pond Rd.	SCC*	Passive Recreation & Wildlife Habitat	Good	Available, with trails	Trail network	SHG*	RR* & FC*
Montague Road Lot	SCC*	Wildlife Habitat	Good	Available, but no trails	Could create short trail	Tax title & TM* vote 1992	RR*
Mt. Mineral Road Lot	SCC*	Passive Recreation & Wildlife Habitat	Good	Available from DCR* road	Hiking on DCR* land	Tax title & TM* vote 1992	FC*
Haskins Meadow, Amherst & Leverett line	SCC*	Passive Recreation & Wildlife Habitat	Good	Available, but very limited parking	Mowed trail through meadow	SHG* with Amherst & Leverett & gift	FC*
Lake Wyola land under water and dam area	SCC*	Active & Passive Recreation & Wildlife Habitat	Good	Available in many locations	Boating, fishing, swimming	SHG* for dam area	LW*
Gage Conservation Area, Sand Hill Rd.	ACC*	Passive Recreation & Wildlife Habitat	Good	Available, but with limited roadside parking	One loop trail, could add trail into Houston Conservation Area	SHG*-Amherst	FC* & RR*
Houston Conservation Area, West Pelham Rd.	ACC*	Passive Recreation & Wildlife Habitat	Good	None marked	Could create trail from Gage Conservation Area	SHG*-Amherst	FC* & RR*

*__Key to abbreviations:__ **SCC** - *Shutesbury Conservation Commission;* **ACC** - *Amherst Conservation Commission;* **SHG** - *Self-Help Grant;* **TM** – *Town Meeting;* **DCR** – *Massachusetts Department of Conservation & Recreation (Quabbin Watershed Lands);* **FC** - *Forest Conservation Zoning District;* **RR** - *Roadside Residential Zoning District;* **TC** – *Town Center Zoning District;* **LW** – *Lake Wyola Zoning District.*

Table E-3. Open Space Parcels with Limited Protection from Development			
PUBLIC & PRIVATE LAND WITH LIMITED PROTECTION			
Owner	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Shutesbury			
West Cemetery	P	29, 31-36	8.2
Locks Hill Cemetery	D	10	1.0
Pratt Corner Cemetery	U	7	0.3
Subtotal			***9.5***
Town Common	M	1, 2, 4	0.3
Land with Limited Protection Owned by Shutesbury			**9.8**
Town of Amherst			
Atkins Reservoir & Adams Brook Watershed Lands	T	6	22.9
	U	3, 6, 8, 26	141.7
	V	7, 8, 32	16.3
	W	1, 2, 9, 10	49.2
Atkins Reservoir & Adams Brook Watershed Lands (Individual Z lot parcels: T3,4,11,12,14; U5; V12,13; W3,7,8,11-14,29,31,33,47; X1-3)	ZT	3	266.7
Land with Limited Protection Owned by Amherst			**513.8**
Jewish Community of Amherst			
Private Cemetary	T	115	**2.2**
TOTAL PUBLIC & PRIVATE LAND WITH LIMITED PROTECTION			**525.8**

(Source: Town of Shutesbury Assessors Records on CD; December 2009, with some changes based on deeds, MassGIS data and Town of Amherst 2010 data.)

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development				
TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61	**CRAWFORD MOORE LLC**	**D**	**9**	**19.9**
	HEMINGWAY, JAMES C.	**D**	**12**	**44.8**
	KRAFCHUK, ELIZABETH	**D**	**14**	**65.1**
	BROWN, ROBERT S.	**D**	**15**	**69.1**
	CITINO, FRANK	**D**	**16**	**33.4**
	ZAJICEK, PETER T.	**D**	**17**	**12.7**
	BROWN, ROBERT S. ESTATE	**D**	**20**	**68.3**
	BROWN, ROBERT S.	**D**	**21**	**40.8**
	BROWN, ROBERT S.	**D**	**22**	**2.0**
	BROWN, ROBERT S.	**D**	**24**	**14.5**
	FOOTIT, JEAN	**D**	**31**	**29.2**
	CRAWFORD MOORE LLC	**D**	**102**	**31.4**
	CRAWFORD MOORE LLC	**D**	**103**	**3.2**
	CRAWFORD MOORE LLC	**D**	**104**	**5.0**
	FOOTIT, BARBARA	**E**	**2**	**239.1**
	FOOTIT, BARBARA	**E**	**25**	**8.9**
	PUFFER, STEPHEN J.	**F**	**1**	**22.7**
	PUFFER, STEPHEN J.	**F**	**23**	**75.3**
	KELLOGG, JEREMY G.	**F**	**26**	**25.1**
	BONNAR, DEACON	**F**	**28**	**48.4**
	W. D. COWLS, INC.	**F**	**30**	**4.4**
	BONNAR, DEACON	**F**	**34**	**14.8**
	MIZAUR, CAROLE J.	**F**	**35**	**19.8**
	PUFFER, STEPHEN J.	**F**	**131**	**6.0**
	PUFFER, JOHN	**F**	**132**	**10.3**

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development (Continued)				
TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61	**WATKINS, LEE MARK**	**H**	**10**	**13.9**
	FARRINGTON, FRANCIS	**H**	**41**	**18.6**
	COOK, THOMAS	**H**	**50**	**29**
	PLAZA, JAMES M.	**H**	**56**	**11.5**
	AFFERICA, JOAN M.	**J**	**8**	**1.0**
	FOOTIT, BARBARA	**K**	**61**	**2.0**
	MAURI, MICHAEL J.	**K**	**123**	**5.0**
	PERRY, CHRISTOPHER	**L**	**16**	**70.7**
	VOGES, FORREST	**M**	**20**	**17.9**
	SMITH, MIRANDA K.	**M**	**80**	**13.0**
	W. D. COWLS, INC.	**N**	**34**	**11.7**
	WATERMAN, EARL A.	**O**	**21**	**24.5**
	W. D. COWLS, INC.	**O**	**23**	**15.8**
	W. D. COWLS, INC.	**O**	**58**	**0.4**
	W. D. COWLS, INC.	**O**	**59**	**1.3**
	SPRINGER, ALBERT E	**O**	**84**	**1.5**
	W. D. COWLS, INC.	**O**	**108**	**1.0**
	LAUDER, DAVID M.	**O**	**118**	**75**
	W. D. COWLS, INC.	**P**	**2**	**11.5**
	POTYRALA, CHESTER P.	**P**	**3**	**47.6**
	GJELTEMA, ROLAND W., AS TRUSTEE	**P**	**13**	**80.1**
	KENERSON, LAUREY C	**P**	**37**	**5.2**

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development (Continued)				
TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61	**KENERSON, LAUREY C.**	**P**	**38**	**13.8**
	MARGLIN, STEPHEN.	**Q**	**11**	**3.5**
	MARGLIN, STEPHEN	**Q**	**51**	**14.0**
	W. D. COWLS, INC.	**R**	**27**	**1.5**
	FOSTER, WINTHROP JR.	**S**	**1**	**15.2**
	FOSTER, WINTHROP JR.	**S**	**3**	**39.2**
	PLAZA, ALPHONSE & RITA	**S**	**36**	**10.6**
	GAGE, MARGARET R. ESTATE	**T**	**8**	**11.5**
	W. D. COWLS, INC.	**U**	**10**	**6.6**
	W. D. COWLS, INC.	**U**	**11**	**5.1**
	STERN FAMILY REVOCABLE TRUST	**V**	**6**	**10.5**
	W. D. COWLS, INC.	**W**	**94**	**0.0**
	MILLER, JEAN (D25, 28, 29, 41)	**ZD**	**25**	**101.9**
	W. D. COWLS, INC. (D37, 39, 49, 57, 58, 62-74, 88; F27; H46-49,51, 57-60, 80-99, 134-136, 137, 145-150, 156-158)	**ZD**	**37**	**263.0**
	W. D. COWLS, INC. (F15-17, 24, 25, 53, 100-104, 116-124)	**ZF**	**15**	**296.0**
	W. D. COWLS, INC. (F18-20)	**ZF**	**18**	**232.0**
	W. D. COWLS, INC. (F32, 37-41, 126-129)	**ZF**	**32**	**121.0**

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development (Continued)				
TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61	**MILLER, JEAN G. (F45,47)**	**ZF**	**45**	**49.2**
	W. D. COWLS, INC. (G2-6, 8, 25-29, 32, 33; T2, 5, 7, 9, 10, 13, 15, 16, 23, 24, 26-32, 35, 49-53, 55-58, 103, 142-149, 152-154)	**ZG**	**2**	**829.0**
	W. D. COWLS, INC. (H12, 13, 30)	**ZH**	**12**	**42.2**
	RICHTER, SCOTT S. (H36, 37)	**ZH**	**36**	**145.5**
	DALE, BRIAN J. (K8, 9, 36, 119)	**ZK**	**9**	**20.2**
	MAURI, MICHAEL J. (K27, 28, 32)	**ZK**	**28**	**205**
	W. D. COWLS, INC. (L20-22)	**ZL**	**20**	**51.8**
	W. D. COWLS, INC. (O3-5)	**ZO**	**3**	**150.3**
	W. D .COWLS, INC. (O6, 8-16, 102-107)	**ZO**	**6**	**269.4**
	SPRINGER, ALBERT E. (O18, 113)	**ZO**	**18**	**107.8**
	GROVES, ROBERT L. (O70, 71)	**ZO**	**70**	**17.9**
	W. D. COWLS, INC. (P7, 9, 12, 70)	**ZP**	**7**	**70.1**
	W. D. COWLS, INC. (Q6, 12, 17 ,23, 25, 29)	**ZQ**	**6**	**215.4**
	MCLEAN, DANIEL G. (R3, 4, 20, 21, 25)	**ZR**	**3**	**34.5**
	WEILERSTEIN, PHILIP J. (R7, 26)	**ZR**	**7**	**2.6**
	W. D. COWLS, INC. (U2, 4)	**ZU**	**2**	**140.2**
	POVERTY MOUNTAIN FARM LLC (V1,5)	**ZV**	**1**	**124.0**
	W. D. COWLS, INC (W6, 21-28, 32, 34-46, 48, 95-103)	**ZW**	**6**	**389.0**
	W. D. COWLS, INC. (X4, 5, 22)	**ZX**	**4**	**13.6**
TOTAL LAND IN CHAPTER 61				**5385.4**

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development (Continued)				
TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61A	**HAYES, RAYMOND J.**	**H**	**53**	**67.9**
	HAYES, RAYMOND & JOANNA	**H**	**54**	**23.3**
	STERN FAMILY REVOCABLE TRUST	**V**	**6**	**10.0**
TOTAL LAND IN CHAPTER 61A				**101.2**
Chapter 61B	**BROWN, ROBERT S.**	**D**	**21**	**22.3**
	BROWN, ROBERT S.	**D**	**22**	**1.4**
	GREENBAUM, HILDA, TRUSTEE OF REV	**D**	**35**	**20.8**
	NEWTON, JACQUELYN V.	**D**	**36**	**6.5**
	ADDELSON, RICHARD	**F**	**78**	**1.0**
	CLARK, THOMAS	**G**	**20**	**1.3**
	CLARK, THOMAS	**G**	**21**	**1.0**
	CLARK, THOMAS	**G**	**22**	**1.0**
	GREENBAUM, HILDA B. TRUSTEE OF REVOCABLE I	**H**	**43**	**29.5**
	STONE, RANDALL	**H**	**61**	**7.7**
	ROSEN, JEANNE (JEWELL)	**H**	**103**	**10.0**
	MOTZKIN, GLENN	**H**	**116**	**9.4**
	JANOWITZ, JULIAN	**K**	**122**	**2.0**
	GREENBAUM, HILDA B. TRUSTEE	**L**	**17**	**122.4**
	CONCA, MICHAEL P.	**M**	**27**	**10.0**
	MARGLIN, STEPHEN	**Q**	**11**	**6.0**
	HANSON, DAVID A.	**Q**	**18**	**8.0**

Table E-4. Privately-Owned Open Space Parcels with Temporary Protection from Development (Continued)

TEMPORARILY-PROTECTED LANDS UNDER CHAPTER 61, 61A & 61B				
Ownership Status	**Owner (and Individual Z Lot Parcel Numbers**	**Assessors Map #**	**Assessors Lot #**	**Acreage**
Chapter 61B	PEARSON, WENDY	Q	20	4.7
	CULLEY/DINARDI REAL ESTATE TRUST	Q	68	8.0
	MARGLIN, STEPHEN	Q	73	3.0
	PEARSON, WENDY	Q	75	2.6
	PEARSON, WENDY	Q	76	3.2
	PEARSON, WENDY	R	15	33.6
	HAYES, ROBERT B.	S	6	15.7
	DISE, SANDRA K.	S	8	12.0
	VINSKEY, MICHAEL A.	T	20	16.8
	JACOBY, DIANE	T	96	13.3
	HOUSTON, THOMAS F.	U	17	2
	HOUSTON, THOMAS F.	U	18	3.0
	HOUSTON, THOMAS F.	U	45	2.0
	KOHLER, RALF R.	W	30	11.4
	ADDELSON, KATHRYN (F50, 51, 75)	ZF	50	4.7
	CLARK, THOMAS (G18, 19, 34, 35)	ZG	18	4.2
	DAVIES, CATHERINE M. (H28, 29, 32)	ZH	28	41.0
	JANOWITZ, JULIAN (K23, 26, 118, 121)	ZK	118	137.6
	REHORKA, FRANK G. (M15, 16)	ZM	15	24.0
	CONWAY, DOLORES M. (W16-20)	ZW	16	46.5
TOTAL LAND IN CHAPTER 61B				**649.6**
TOTAL SHUTESBURY LAND IN CHAPTER 61, 61A, & 61B				**6136.2**

(Source: Town of Shutesbury Assessors Records on CD; December 2009, with some changes based on deeds and new Chapter 61 list from Assessor in January 2011.)

Table E-5. Unprotected Land of Conservation or Recreation Interest					
Publicly-Owned Parcels					
Map & Lot	**Owner & # from text**	**Location**	**Acres**	**Recreation Potential**	**Conservation Interest**
O37& 38	Shutesbury 1	Field behind Fire Station	3	**High** Fields used for soccer, football, softball.	**Low**
O47	Shutesbury 2	Field behind Town Hall	2	**High** Used for general play, town events, farmers' market.	**Low**
O43& 48	Shutesbury 3	Woodland behind Town Hall	9	**Medium** Has potential for trails, with parking behind Town Hall.	**High** Abuts DCR land, most is in BioMap2 CNL, top 10% state Interior Forest Block, Zone C of Quabbin water supply.
T78	Shutesbury 4	Fields & Woodland behind Elementary School	8 (est.)	**High** Existing ball fields and only public playground, potential for trails.	**Medium** Part of larger forest block that becomes part of BioMap2 CNL & top 10% state Interior Forest Block, school use for environmental education.
O32	Shutesbury 5	Woodland on back part of old Lewis Taylor homestead	14 (est.)	**Medium** Potential for trails, with parking at library.	**High** In Zone C of Quabbin water supply, southern 1/3 is in BioMap2 CNL, part of larger forest block that becomes part of top 10% state Interior Forest Block.
O83	UMass 6	Pelham Hill Road	3	**Medium** Abuts O32 and could extend trails.	**Medium** In Zone C of Quabbin water supply, part of larger forest block that becomes part of BioMap2 CNL & top 10% State Interior Forest Block.

Table E-5. Unprotected Land of Conservation or Recreation Interest (Cont.)					
Publicly-Owned Parcels (Cont.)					
Map & Lot	**Owner & # from text**	**Location**	**Acres**	**Recreation Potential**	**Conservation Interest**
F48	Shutesbury 7	Off Montague Road	16.5	**High** Significantly increases adjacent conservation area for passive recreation use. Old trails across property.	**High** Half of property is BioMap2 Core Habitat & rest is CNL; touches on part of top 1% State Interior Forest Block. Contains great bog and wooded wetland. Part of a large regionally-important natural area
B10, 27, & 28	Shutesbury 8	Three adjacent lots off Great Pines and Lake Drive	0.3	**Low** Too small for anything other than nature observance.	**High** Woodland in high-density residential area near Lake Wyola. Part of NHESP Estimated and Priority Habitat for rare species, adjacent to BioMap2 Core Habitat.
K53, 54, & 55	Shutesbury 9	Three adjacent lots off Wendell Road	3.6	**Medium** Steep rocky slope, access possible, but not easy.	**High** Adjacent to large block of CR-protected land. Within 500' of BioMap2 CNL on east and within 200' of Core Habitat on west side.
N65& 70	Shutesbury 10	Two adjacent lots off New Boston Road	14	**Low** Steep slope about 500' from New Boston Road.	**High** Abuts DCR state forest and watershed land, part of BioMap2 Core Habitat and top 1% state Interior Forest Block.
M30	Shutesbury 11	Lot off Wendell Road	8	**Low** Depends on whether there is an easement for access to this back land.	**High** Abuts DCR watershed land. Is within BioMap2 CNL and Zone C of Quabbin water supply, and within 100' of top 1% State Interior Forest Block.
L9	Shutesbury 12	Lot off Briggs Road	2	**Low** Steep slope about 1000' from Briggs Road & New Boston Road.	**High** Surrounded by DCR state forest and watershed land, part of BioMap2 Core Habitat and top 1% state Interior Forest Block.

Table E-5. Unprotected Land of Conservation or Recreation Interest (Cont.)					
Privately-Owned or Non-Profit-Owned Parcels					
Map & Lot	**Owner**	**Location**	**Acres**	**Recreation Potential**	**Conservation Interest**
H55, 111	Shutesbury Athletic Club 13	Wendell Road	3	**Medium** Indoor/outdoor meeting area.	**Low** Part of vernal pool on back of property.
ZB331	Lake Wyola Association 14	Corner Lakeview Road & Shore Drive	1	**Medium** Meeting area also used for events such as movies in summer-time.	**Low** Cleared lot.
C3&4	Pine Brook Camp (Camp Anderson Foundation) 15	Lakeview Road	37.5	**Medium** Two wooded lots used for camp, undeveloped with canoe access to Lake Wyola and woods trail. Abuts most of Lake Wyola State Park. 120 acres total including land in Wendell.	**Medium** Large block of forest and wetland. Lake Wyola watershed.
D9& 102	Morse Hill Outdoor Education Center 16	Locks Pond Road	51.5	**Medium** Wooded lots with outdoor environmental education center, including rope courses and camping.	**Medium** Large block of upland forest with tall pines. Sawmill River on northern boundary. Western portion in BioMap2 Core Habitat & CNL, NHESP priority & estimated habitat, and top 10% state Interior Forest Block. Lake Wyola watershed.
Many	Robert Frost Trail 17	Southwestern corner of town	n/a	**High** Regional hiking trail across private and Amherst watershed land.	**Low**, except for connecting undeveloped parcels.
Many	Metacomet& Monadnock (M & M) Trail 18	Southwestern corner of town	n/a	**High** – Interstate hiking trail across private and Amherst watershed land.	**Low**, except for connecting undeveloped parcels.

Table E-5. Unprotected Land of Conservation or Recreation Interest (Cont.)

Privately-Owned or Non-Profit-Owned Parcels (Cont.)

Map & Lot	Owner	Location	Acres	Recreation Potential	Conservation Interest
Many	New England National Scenic Trail 19	Eastern side of town, route yet to be determined, but probably through DCR land.	n/a	**High** Interstate hiking trail across private and state land.	**Low**, except for connecting undeveloped parcels, or if the National Park Service acquires some land for the trail.

NOTE: BioMap2 CNL – BioMap 2 Critical Natural Landscape; CR – Conservation Restriction.

Appendix F: ADA Access Self-Evaluation

ADA/Section 504 Report

An ADA/Section 504 Report is required for the Open Space and Recreation Plan by DCS. "ADA" is the acronym for the Americans with Disabilities Act. The Town of Shutesbury has a formally-established ADA Committee, which completed a Self-Evaluation and Transition Plan in 2004. This plan looked at limitations on access at the Town Hall, the Town Common, and numerous open space areas, including town-owned trails; recreational open fields; Lake Wyola and open space behind the Town Hall, which includes grasslands, fields and riparian wooded areas.

In addition to the conventional understanding of "disabled" as limiting physical abilities to access town-owned areas, the Town of Shutesbury has expanded it to include chemical sensitivities which preclude town residents from attending events held in public buildings. Accordingly, "fragrance-free" zones have been established for town-sponsored events.

The opportunity to provide physical access for disabled residents in the town-owned areas for recreational opportunity has been limited by the access to funds in the town's budget for capital projects such as paved trails; interpretative signs; and railings. Many of the open space areas in Shutesbury are located in remote areas with limited accommodations (a listing of lands managed by the Shutesbury Conservation Commission appears below). However, Lake Wyola State Park provides disabled-access to the swimming beach and fishing area, via ramps and wheelchair-accessible bathrooms and shore access for fishing.

Rebecca Torres, Town Administrator, is the town's ADA/504 Coordinator (Attachment A) who ensures that hiring practices for the town conform to current ADA standards (Attachment B).

Facility Inventory

A facility inventory is required for every area or facility under the jurisdiction of the Conservation Commission or recreation department that has any accompanying infrastructure built. These lands, totaling **134.9 acres**, are permanently-protected conservation land and, due to their undeveloped state, are used generally for wildlife habitat and passive recreation.

- Lake Wyola Conservation Areas. The former town beach, located on the southwestern section of the lake, is adjacent to the town boat launching area and is little used. It has been grassed over and most town residents now use the Lake Wyola State Park beach for swimming. There is a public boat ramp and composting toilet facility at the parking area at the end of Randall Road. The path to the former beach and trails is steep and rough, as are most of the trails. The South Brook Conservation Area abuts this conservation area

on the south. As described in the Section 5 (*Inventory of Lands of Conservation and Recreation Interest*) portion of this document, these two parcels create a **97-acre area** of lake and shoreline, wooded swamp and upland woods, with a series of trails in the upland portion. South Brook has access from Wendell Road, with roadside parking for a few cars, but there are no facilities and most of the trails are too uneven and steep for access by persons with disabilities. The third and fourth parcels are located on the northern side of the lake – a **l.4-acre parcel** off Cove Road (affording picnicking) and a small, grassy area with an island off Merrill Drive – comprising **0.6 acres**. The Cove Road parcel has a single bench, near the shoreline, that faces out on the lake, as well as access to the shoreline for kayaks and canoes. The path in is somewhat uneven and would need a little work to provide access for persons with disabilities, but the major obstacle to access is the lack of space for any parking. The Merrill Drive parcel is usually mowed by the neighbor and looks like a lawn. Although a bridge to the island used to exist, the island is only accessible by boat now. The lawn area is flat and could be accessible now for some people with disabilities, but would probably need a paved path to the shoreline area for wheelchair use. This parcel could be enhanced by a circular paved path and some plantings. It has a view of the cove, and limited parking is now available at the edge of the property and along the road.

- Montague Road. This **3-acre** parcel consists of a portion of a bog and wooded wetland, with some upland forest. There are presently no trail and no facilities. There is a little relief to the site, but an accessible path might be possible through the heavy mountain laurel understory to a view of the bog and forest. There is only roadside parking possible, at this point.

- Mount Mineral Road. This is a **1.7-acre** landlocked area whose property boundaries have not been well demarcated. There are no facilities and no direct access.

- Haskins Meadow. This conservation area is located at the northeastern corner of Amherst and the southwestern corner of Shutesbury where they abut the southern border of Leverett. The Haskins Meadow Conservation Area includes land in both Amherst and Shutesbury and the Shutesbury-owned portion comprises **31 acres**. It consists of several fields that are occasionally mowed by Amherst, with a small brook running through them, and a large, forested wetland. Some of the fields are transitioning into brushland. There is a path mowed by Amherst through the major field, which starts on the Amherst property and extends to the boundary of the housing development on the hill in this section of Shutesbury. It is primarily used by immediate neighbors for walking dogs. There are no facilities, and no parking or access through Shutesbury, except through the private development. Access is available at some distance from Amherst, but only via roadside parking. Possible access through the Leverett waste transfer station was proposed at the time the grant application was made to acquire the land, but has not been pursued since. The mowed path through the field traverses rough and uneven ground,

and there is no parking for easy access to the property, making it unusable for people with some types of disabilities.

Opportunities to provide access for persons with disabilities do exist for some of these areas, such as some parking access at trailheads and/or interpretive displays of the fauna and flora which inhabit these areas. Trails within South Brook Conservation Area are probably the best candidates for trail access by persons with disabilities. Parking opportunities are limited at the lands located on the northern portion of the lake while the other areas are either isolated from access, contain rough and steep terrain, or are generally aquatic in nature. The Merrill Drive Conservation Area could be improved relatively easily for better access by persons with disabilities to the shoreline for picnicking and views of the cove.

Since no physical construction for access by persons with disabilities has occurred at these sites, the Facility Inventory sheet provided by the State has not been completed. It is strongly hoped that the new revenue afforded by the recently-enacted Community Preservation Act and/or Self-Help monies can be used to initiate construction of access for persons with disabilities to trails within South Brook Conservation Area.

Transition Plan

The town's 2004 *Self Evaluation and Transition Plan* contains a description of recreational and open space opportunities for the disabled within town. Its characterization of physical limitations for persons with disabilities, for both open space and trails, indicates the need for paved or groomed areas.

Specific recommendations contained in the transition plan include:

- "*The Recreation and Open Space Committee should coordinate trail improvement plans and efforts with the ADA Committee to increase accessible trails. Such trails should be paved with stone dust, 32" wide and graded according to wheelchair access guidelines*."
- Creation of no-vehicle trails on town lands (to accommodate persons with chemical sensitivities).
- Passing town bylaws creating motor-free "quiet days" on land and water throughout the year.
- Investigation of educational methods for decreasing pollution from wood stoves, and creation of a town bylaw with provisions that would help prevent and control smoke pollution.
- Extension of the prohibition of smoking on school grounds to all municipal grounds.

The ADA Committee has also focused on creating access on the Town Common with additional planted trees to afford shade. The ADA Committee also sees access potential for

persons with disabilities in the newly-acquired land behind Town Hall, due to the existing parking opportunities, the large size of the grassed area and the shade provided by mature trees fringing this area.

ATTACHMENT A

TOWN OF SHUTESBURY
SELECTBOARD
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Shutesbury, MA 01072
Fax (413) 259-1107
E-mail selectboard@shutesbury.org

March 23, 2015

Janice Stone
Shutesbury Open Space Committee
1 Cooleyville Rd.
Shutesbury, MA 01072

Dear Janice,

This is to confirm that the Shutesbury Town Administrator serves as the American with Disabilities Act (ADA) Coordinator and the Affirmative Action (AA) Officer for the town. This duty is listed in the town administrator's job description.

Sincerely,

Elaine Puleo
Selectboard Chair

April Stein
Selectman

Michael Vinskey
Selectman

ATTACHMENT B

TOWN OF SHUTESBURY
TOWN ADMINISTRATOR
P.O. Box 276
Shutesbury, MA 01072
Fax (413) 259-1107
E-mail townadmin@shutesbury.org

March 30, 2015

Affirmative Action/Equal Employment Opportunity

The Town of Shutesbury is an Equal Employment Opportunity/Affirmative Action employer. In compliance with the Americans with Disabilities Act, the Town will provide reasonable accommodations to qualified individuals with disabilities and encourages both prospective and current employees to discuss potential accommodations with the Town.

I attest to the fact that the hiring practices of the Town of Shutesbury conform to the current ADA standards.

Rebecca Jones — 3/30/15

Rebecca Torres, Town Administrator
Date
& A.D.A. Coordinator

Appendix G: Glossary of Acronyms, Abbreviations & Select Terms

Glossary of Acronyms, Abbreviations & Select Terms

ADA – Americans with Disabilities Act

APR – Agricultural Preservation Restriction (Mass. Dept. of Agricultural Resources)

BVW – Bordering Vegetated Wetland (under WPA)

CMR – Code of Massachusetts Regulations

CPA – Massachusetts Community Preservation Act

CR – Conservation Restriction

CRWC – Connecticut River Watershed Council

CWCS – Massachusetts Comprehensive Wildlife Conservation Strategy (DFW)

DCR – Massachusetts Department of Conservation & Recreation

DCS – Division of Conservation Services (under EOEEA)

DFG – Massachusetts Department of Fish & Game

DFW – Division of Fisheries & Wildlife (under Massachusetts DFG)

E - Endangered Species under MESA

EOEEA – Massachusetts Executive Office of Energy & Environmental Affairs

FC – Forest Conservation District (Shutesbury Open Space Design Zoning Bylaw)

FEMA – Federal Emergency Management Agency

FIRM – FEMA Flood Insurance Rate Maps

gpd – gallons per day

gpm – gallons per minute

IBA – Important Bird Area (Massachusetts Audubon Society)

IWPA – Interim Wellhead Protection Area, required for public water supplies that do not have delineated Zone II recharge areas.

LW – Lake Wyola District (Shutesbury Open Space Design Zoning Bylaw)

LSP – Licensed Site Professional under the Massachusetts Contingency Plan ("21E")

M&M Trail - Metacomet-Monadnock Trail

MassDEP – Massachusetts Department of Environmental Protection

MassDOT - Massachusetts Department of Transportation

MassGIS – Massachusetts Office of Geographic Information

MEPA – Massachusetts Environmental Policy Act

MESA – Massachusetts Endangered Species Act

MGL – Massachusetts General Law

NCRS – Natural Resources Conservation Service (USDA)

NFIP – National Floodplain Insurance Program (FEMA)

NGVD - National Geodetic Vertical Datum 29 - The datum was used to measure elevation (altitude) above mean sea level (MSL).

NHESP – Natural Heritage & Endangered Species Program (DFW)

NENST – New England National Scenic Trail

NRCS – Natural Resources Conservation Service

OSD – Open Space Design provision of the Shutesbury Zoning Bylaw

RR – Rural Residential District (Shutesbury Open Space Design Zoning Bylaw)

SC – Species of Special Concern under MESA

T – Threatened Species under MESA

TC – Town Center District (Shutesbury Open Space Design Zoning Bylaw)

Title 5 – Massachusetts State Environmental Code regulating septic systems

UMASS – University of Massachusetts

USDA – United States Department of Agriculture

USGS – United States Geological Survey

WPA – Wetland Protection Act (Massachusetts)

WR – Watershed Restriction

WRC – Shutesbury Water Resources Committee

ZONE I - The protective radius required around a public water supply well or wellfield.

ZONE II - The area of the aquifer that contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated.

ZONE A – 100-year floodplain

ZONE A1 - 100-year floodplain determined by detailed hydrologic methods

ZONE B – 500-year floodplain

ZONE C – areas of minimal flooding above the 500-year floodplain