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Range and River an Open Space and Recreation Plan

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**RANGE AND RIVER
AN OPEN SPACE AND RECREATION PLAN
SOUTH HADLEY, MASSACHUSETTS**

FALL 1992

Principal Investigators

John R. Mullin, Ph.D., AICP

Meir Gross, Ph.D.,

Jeanne Armstrong, LandUse, Inc.

The Center of Economic Development would like to thank the
Research Team:

Carmine Angeloni

Bruce Bennett

Dan Dorsky

Patti Pakkala

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It is also important to note the current membership of the Open Space Planning Committee which includes Chairperson **Wallace E. Kluza** of Amherst Road, **Isabelle Sprague** of Woodbridge Street, **Tom Kennedy** of Lathrop Street, **Edgar Noel** of Pine Street, **William Astley** of Woodbridge Street, **Martha Brown** of Searle Road and **Robert Russell** of Woodbridge Street.

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Section 1 - Plan Summary

The town of South Hadley is unique in that it is located in a critical transition zone between developed urban centers to the south, and the more agricultural and rural communities to the north. This dichotomy serves as the single most important influence on the town's open space and recreation planning. Range and River - An Open Space and Recreation Plan for the Town of South Hadley, Massachusetts is intended to provide a basis for open space and recreation planning opportunities for the citizens of the town of South Hadley consistent with the above theme. Further, the plan focuses on protection and recreational development of the two major landscape features which dominate the landscape of South Hadley, the **Holyoke Range** and **Connecticut River**, as well as increasing recreation opportunities throughout the more developed southern section of town.

This plan begins by describing the process of open space planning in South Hadley, as well as the various methods used for soliciting public input. The reader is then "introduced" to the town in terms of its regional context, history, demographics and growth and development patterns. This is followed by a discussion of the physical environment of the town, its geologic origins as they influence soils and topography, a description of flora and fauna, water resources and primary environmental problems. An "inventory of lands of conservation and recreation interest" is also developed. Community goals are discussed and the community's open space and recreation needs are analyzed. Based on all these considerations, a five-year action plan is designed to implement the community's goals and objectives for open space and natural resource protection.

[The December 1992 draft plan is designed to serve as a springboard for town-wide deliberations regarding South Hadley's open space and recreation needs and opportunities. Throughout the text, there are messages in this bracketed format which are intended to be helpful during this process. They should be deleted from the Town's final draft.]

Section 2 - Introduction

2.1 Statement of Purpose

Range and River - An Open Space and Recreation Plan for the Town of South Hadley, Massachusetts represents the first update of a long-term, comprehensive planning effort for "the acquisition and protection of open space in the town of South Hadley", which was the objective of

the original plan drafted in 1988. The town of South Hadley Board of Selectmen established an Open Space Planning Committee in December of 1987 for the purpose of completing the original project.

In the short time since completion of the 1988 plan, South Hadley has been successful in meeting some action targets, most notably the Canal Park river access, and water supply protection district amendments to the South Hadley zoning by-laws. There are still further considerations, however, which will need to be addressed.

The primary purpose of this five year plan will be to improve existing efforts and establish long and short term goals and objectives for the purposes of preserving and protecting public open spaces in the Town of South Hadley. The plan will also serve to target additional lands for the creation of potential corridors and public access to the Connecticut River and Holyoke Range. This effort is also intended to maintain South Hadley's eligibility for certain Executive Office of Environmental Affairs (E.O.E.A.), Division of Conservation Services (D.C.S.) grant programs. These include Self-Help (Chapter 132A, Section 11), Urban Self-Help (Chapter 933, Acts of 1977 as amended) and Federal Land and Water Conservation (Public Law 88-578) funds which will allow for future acquisition of lands. Since 1964 the town has received over \$430,000 in Self-Help funds to acquire nearly 500 acres of open space and recreation land. Historic Canal Falls Park was developed through the use of Land and Water Conservation Funds.

2.2 Planning Process and Public Participation

The December 1992 draft of Range and River presents a realistic long-term action plan based upon current available information about the cultural, recreational and natural resources as well as the needs of the town. This plan contains recommendations for continued protection and management of these resources and for meeting identified needs of residents. Copies of this and the original Open Space Plan are available through the Town Conservation Commission or Planning Board offices.

[Note to the Open Space Planning Committee: Working from the December 1992 draft of Range and River, the community of South Hadley can organize forums, charettes, neighborhood meetings, special focus group meetings (e.g.; Handicapped Affairs, Canal Park Committee) to publicize the plan. It is important to limit the focus of a particular method of public input to one or two issues in order to keep the discussion focused and expedite results. It may be helpful to use the 1992 draft's logo for promotional purposes. Results of the survey should be

published as a newspaper article or two, as well as appended to *Range and River* and discussed in the public hearings for the plan. See Sample Survey - Appendix D

Range and River was developed by the South Hadley Open Space Planning Committee with technical assistance from the University of Massachusetts Department of Landscape Architecture and Regional Planning through its Regional Planning Graduate Studio program.

Section 3 - Community Setting

3.1 Regional Context

The Town of South Hadley occupies approximately 11,712 acres and is bounded by the southern slopes of the Holyoke Range to the North and the eastern banks of the Connecticut River to the west. It is situated at the southern edge of Hampshire County and within the lands of the Pioneer Valley. For any given community, certain regional characteristics often serve to influence open space and recreation planning to a greater extent than others. This is particularly true for the Town of South Hadley with respect to both the **Holyoke Range** and the **Connecticut River**.

Although much of the land within the Pioneer Valley is primarily Connecticut River floodplain, the boundary which South Hadley shares with Hadley straddles a large portion of one of the few mountain ranges in Eastern North America which runs from east to west. This unique orientation provides a sharp contrast between the types of vegetation found on the north and south facing slopes of the range.

The **Holyoke Range** in South Hadley is a chain of mountains stretching from Mount Holyoke at the eastern bank of the Connecticut river in an easterly direction to Bare Mountain. Other notable peaks in the chain include Mt. Hitchcock, Mt. Norwottuck, Long Mountain and Mt. Holyoke. The gaps or so-called "notches" which occur between the individual peaks are a result of the cracking of underlying volcanic basalt by geologic faults, followed by erosion of the cracks over time. The Range's distinctive profile dominates South Hadley's skyline.

The cultural, recreational and economic aspects of South Hadley have been historically influenced by a dramatic variation in landforms: from the nearly level Connecticut River floodplain of the south and west, through gently sloping, fertile eastern terraces, to the steep intrusive outcroppings of the Holyoke Range which rise to elevations of over 800 feet above the valley floor to the north. *Together, these two aspects of South Hadley's physical environment, the range and the river, serve*

to create a strong base for recreation and open space planning in South Hadley for the present and the future.

The bony spine of the Holyoke Range defines the entire northern boundary of South Hadley and falls into some form of public ownership along most of its southern slope. Included in this area is a large portion of the Joseph Allen Skinner State Park, approximately 86 acres of which are located within South Hadley, and through which winds 11 miles of the Metacomet-Monadnock trail familiar to many of the more adventurous of the region's inhabitants. Also included in this state park is the Summit House which housed a very popular and prestigious resort and restaurant during the nineteenth century. Built in 1851 as a hotel complete with a steam-powered tramway and 70 guest rooms, the "Prospect House" drew distinguished guests and internationally known celebrities such as Charles Dickens, William Wordsworth and Jerome Napoleon Bonaparte. Those who retreated here were, typically, the wealthy who could afford the time and money to get away. The resort managed to survive its harsh mountain environment until 1938 when the tramway and most of the buildings on the site were destroyed in the powerful hurricane of that year.

The overgrown remains of the cable car track that served to transport visitors to the top are still present upon the slopes below the former hotel. The so-called Summit House is currently owned and operated by the Department of Environmental Management (DEM) as part of the Holyoke Range State Park. In 1988, the DEM completed renovations of the remaining hotel structure, and the building now serves as an historic site, information center and scenic viewing area offering panoramic views of the Connecticut River Valley and the town of South Hadley.

The history of the Holyoke Range State Park actually began in the year 1940 with the donation by Joseph Allen Skinner to the DEM of the remains of the "Prospect House" and 375 adjoining acres of mountainous land. Until the mid-1950's the Park was operated as a passive recreation area with the emphasis on trail use. In 1953 the first long-range acquisition and development planning was proposed for the area. It was not until the formation of the Holyoke Range Citizen's Advisory Committee (HRCAC) in 1969, however, that planning was actually taken seriously, resulting in "A Plan for the Protection of the Holyoke Range" in 1973. With this proposal, the DEM established its primary objective for the Holyoke Range State Park: to preserve the scenic and recreational values of the range. This was to be accomplished through the acquisition of all unprotected lands above an elevation of 450 feet, as well as other lands located below this baseline, which meet the above scenic and recreational objectives.

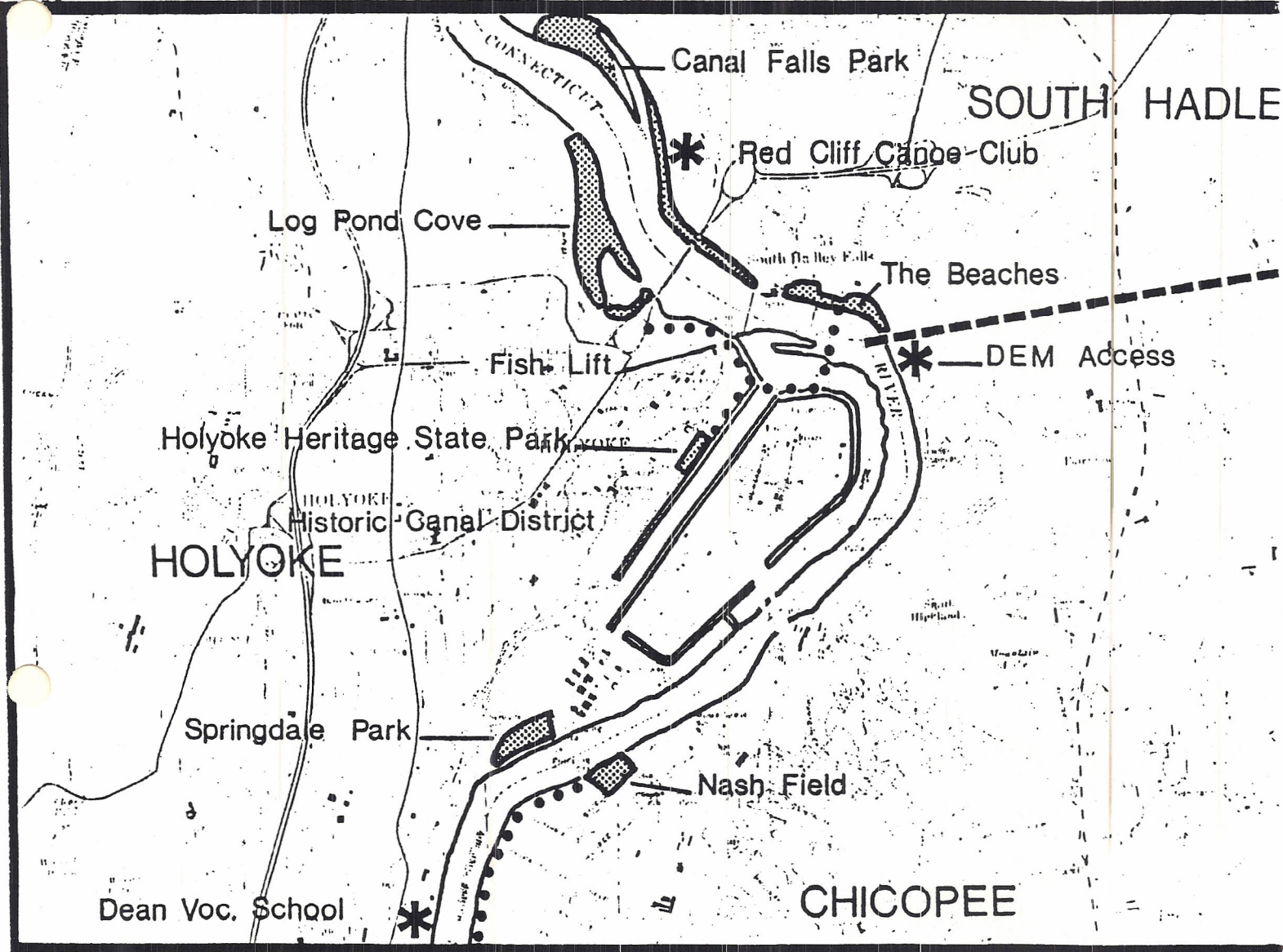
The resulting "ultimate acquisition boundary" map, endorsed by the HRCAC in 1982, outlined approximately 5,000 acres targeted for protection, 2,000 of which were at the time already under public ownership of some type. In 1975 acquisition began in earnest with the purchase of 320 acres in Amherst. To date over 2,500 acres have been added to the total Holyoke Range State Park system. Current public use of the park centers around relatively "passive" recreation only, including year-round hiking, cross-country skiing, limited snowmobiling, horseback riding, and limited picnicking. Wheeled motorized recreational vehicles are prohibited due to the potential for erosion impacts, and hang-gliding, though tolerated, is not actively promoted on the mountain.

Over six and one half miles of the **Connecticut River** form the western boundary of the Town of South Hadley. South Hadley joins the cities of Holyoke, Chicopee and Springfield, and the towns of Agawam, West Springfield and Longmeadow to comprise the so-called *urban riverfront*. This important section of the river is described in a September 1987 study by the Connecticut River Action Program as one of four distinctive "reaches" of the river's 68 mile course through Massachusetts (see Figure 1). The Connecticut River Action Program was established in the summer of 1984 by the DEM to work with riverside communities on long-term planning initiatives for the cleanup and protection of the Connecticut River corridor.

The study reports that with a collective population of a little under 350,000, the urban reach of the river offers opportunities unavailable in many urban environments, including water-based recreational activities such as canoeing, fishing, and riverside strolls. The strong presence of this major water resource in South Hadley serves to provide not only aesthetic beauty, but also opportunities for the psychologically soothing affects that such a water oasis can offer people living in an urban setting.

The neighboring cities of Chicopee, Holyoke, and Springfield share with South Hadley the hydroelectric opportunities which have historically supported the industrial make up of the village of South Hadley Falls at the southern end of town. This same industrial development, however, has contributed dramatically to the pollution of the Connecticut River, affecting the river's water quality in communities as far south as Long Island Sound. The legacy of the 19th century industrial discharges of dyes, heavy metals, cyanides and organic wastes were quite common until the 1960's. In addition, coliform bacteria counts were reported to have exceeded the state standard *by as much as 2000 times*. Since the 1960's more than 300 million dollars have been spent in public clean-up efforts to improve the quality of the Connecticut River.

Figure 1. The Urban Reach of the Connecticut River



Though industrial waste cleanup is considered to be a success south of the Holyoke Dam, the urban reach does not as yet meet class B (fishable/swimmable) standards due to a continued high bacteria count threatening the health of humans, fish and wildlife along the river. The persistence of this condition is attributable to the so-called combined sewer overflow (CSO) in which deteriorating sewer systems, designed to carry both storm water and sewage, continue to discharge excess flows directly to the Connecticut River. Along with eight other cities and towns fronting on the river's edge, South Hadley currently has two representatives on the Connecticut River Task Force for the "20/20 strategic action plan". The \$50,000 state-funded plan is a one year venture aimed at developing a strategy for upgrading the lower reach of the Connecticut River to a grade "B" condition, thus creating a safe environment for both fishing and swimming.

Situated less than twenty miles from prominent industrial, commercial, and educational centers, a majority of the town plays the role of a bedroom community to surrounding municipalities including Springfield, Chicopee, Holyoke, Westfield and Amherst (which houses the largest employer in the region, the University of Massachusetts). However, South Hadley also enjoys an industrial, commercial, and educational base of its own. James River Graphics, now Graphic Technologies International (GTI), is located in South Hadley Falls and is growing within the area of the town which has historically maintained an industrial image. Further adding to the town's fame and character is Mount Holyoke College, a prestigious educational institution founded in 1837 as the first women's college in the United States. Presently, the town's inhabitants enjoy a predominantly residential environment in close proximity to major employment and service centers and within a forty-five minute drive from Bradley International Airport in Enfield, Connecticut.

3.2 Historical Overview

Becoming a municipality

Hadley, the so-called "mother town" of what is now known as South Hadley, was originally settled in 1661 by colonists from Hartford and Wethersfield Connecticut. These settlers traveled north to find a land well endowed with very rich soils. This condition would form the basis for a very successful agricultural community; a success which persists to the present day. As was most of the Pioneer Valley during the seventeenth and early eighteenth centuries, the town of Hadley soon became a predominantly agricultural community with a strong affiliation to the church. In 1727 the settlers south of the Holyoke Range petitioned the General Court to grant them permission to be established as a separate precinct. The advantages to this proposal centered around the issue of local worship as an alternative to observing the Sabbath at the parent church in Hadley eight miles north.

The journey to church involved the laborious task of traversing the Holyoke Range through gaps between the mountain peaks, commonly known at the time as "the cracks". In light of this hardship, the General court finally agreed to grant the parishioners their precinct, but not without a number of attached conditions. This list included construction of a meeting house, selection of a minimum number of settlers, and the settlement of a minister within a given period of time. Having met all but one of the requisites by 1732, South Hadley was granted a second opportunity for a precinct with the stipulation that they settle an orthodox minister within two years. By the following year the congregation had done just that, and proceeded to erect a parsonage for the Harvard graduate.

Pursuant to an order by the British Government to the Governor of Massachusetts prohibiting the establishment of any town requiring representation in the legislature, the precinct was precluded from becoming its own political entity. Precinct status, however, would soon yield to "district" establishment, complete with powers of authority similar to those of a town, but without the rights of representation in the General Court. District representation soon followed the war for independence, and in 1786 a declaration granted that all districts established prior to 1777 were to become officially incorporated towns.

The Impact of River Transportation

Some of the town's early engineering and construction projects were to earn national recognition. One of the country's first navigational canals was completed during a two-year period ending in 1795 as a way of overcoming the obstacle formed by the natural falls of the Connecticut River at the southern portion of the town of South Hadley. The canal covered a distance of approximately two and a half miles through swamp and bedrock, beginning just north of what is now called Cove Island and continuing to a point just below the South Hadley and Chicopee line.

This wondrous engineering solution transported vessels over a 53 foot drop at the "Great Falls" at South Hadley and removed a serious obstacle to the free shipment of goods between upriver towns and larger regional centers in Springfield, Hartford and New York. The first version of the canal included a 230 foot long "inclined plane" which was used to raise and lower the river boats from above and below the falls. In 1805, this canal was altered to include a series of locks for the purpose of creating greater draft for larger river boats. This technology was the first of its kind to be employed and served as a model for the construction of canal systems throughout the country.

With the transformation of the formerly agricultural South Hadley Falls into a community known throughout as "Canal Village", the area soon began to prosper. Travelers and riverboat workers found the growing need for eating and drinking establishments, entertainment and overnight lodging in the area. Taverns began to pop up everywhere to serve an expanding number of people moving an increasing volume of freight through the canal. Local merchants were beginning to take full advantage of a local economy which was flourishing as result of both the canal and the several mills which were highly active throughout the area. The mills of the era included such varied types as saw, grist, shingle and plaster, to name a few.

In addition, the canal served to attract the first tourists to South Hadley. "Man-made" features such as this were rare at the time and tended to draw sightseers from miles around, often to stay the night at The Tavern, a common meeting place of the Proprietors of Locks and Canals. The Proprietors were the legal entity empowered by then President Washington as the administrative agency charged with making the Connecticut River navigable to boats from the confluence of the "Chickopee River" northward to the furthestmost limits of the Commonwealth of Massachusetts. It is interesting to note that, in contrast to the more familiar present-day regional attractions of South Hadley, the natural geologic amenities of river networks, mountains, foliage and open spaces, it was the canal, a "man-made" structure, which drew the first sightseers to South Hadley from all over the surrounding countryside during the colonial period.

The popularity of river transportation systems, primarily involving the flat bottom boat, continued into the 19th century. Though many of the flat bottom boats which traveled the river were propelled by sail, most often they were pushed by planting "setting-poles" into the river bottom and walking the length of the deck from bow to stern, and then carrying the pole back to the bow to repeat the process. This was the routine executed as the boats carried loads of stone, shingles, hides, and lumber as far north as White River Junction, Vermont, and returned with heavier cargo such as iron, sugar, grindstones, salt, and occasionally rum. The trip from Hartford to Wells River, Vermont took approximately sixteen days to complete, and the return trip took about half as long.

The most prosperous period in the operation of the Proprietors of Locks and Canals proved to be between the years 1808 and 1847. With the development of the steam engine in the 1820's, the flat bottom boat owners began to adopt this technology in the operation of their own vessels. In 1826, "The Barnet", owned and operated by the Connecticut River Navigation Company of Hartford, became the first steam boat to pass through the South Hadley Canal locks. The canal peaked in operation in the year 1833 when it reached a total of \$20,016 in tolls collected.

Ironically, however, steam technology would ultimately spell disaster for the use of the river as a principle navigational system, as development of the railroad and the steam locomotive began to intensify. Finally, on Thanksgiving Day 1847, the last steamboat passed through the canal.

During the mid-19th century use of the canal for navigation began to decline seriously with the construction of the 1848-1849 water power dam and the move of transportation facilities from water to rail systems. Eventually the canal system was employed by the paper mills to harness the hydrologic power for consumption by their facilities. According to some historians, it is this commercial use of one of the country's first navigational canals which brought prosperity to the communities of South Hadley and Holyoke; a prosperity which persists to a great extent today. On March 1, 1992, the National Park Service placed the South Hadley Canal District on the National Register of Historic Places commemorating the rich history of this engineering and cultural wonder. Only remnants on the canal may be seen today due to the filling and submergence by the rising river level. A majority of the canal has been covered over by the development of the human environment and other parts have been grown over by maturing vegetation as it experiences the process of ecological succession. Located along the eastern portion of the peninsula commonly referred to as Cove Island are the skeletal remains of what was once the northern section of the famous South Hadley Canal. The trees and vines which once formed an indigenous archway of over the boatway are now well past maturity and are fallen, and recessed over the old canal. Despite its overgrown condition, the old canal is still navigable by canoe.

Crossing the Range

At the western end of the Holyoke Range, at the base of Mount Holyoke, lies the site of a narrow gorge called The Pass of Thermopylea. As history recalls, this is the location at which early settlers began construction of a route through the range. Clearing of the Pass was accomplished through the curious method of pouring water over exposed rock within the intended passageway, allowing the rock to freeze, and raking away the resulting debris. A second passageway to the North used by the early comers was the natural migratory path through the Holyoke Range at "Round Hill Pass", now known as "The Notch". The construction of a road connecting Amherst and Granby through this pass, later to become Route 116, was recognized as a major regional accomplishment of the late 18th century era.

The College

Mount Holyoke Seminary located in the eastern section of South Hadley was founded in 1837 by Mary Lyons as the country's first institution dedicated to the higher education of women. This occurred 200 years after the first men's college was established. With the establishment of the

Seminary, which finally became Mount Holyoke College in 1893, came acquisition and protection of the many expanses of open spaces which today comprise the majority of the campus. In subsequent years, the college would acquire more land for its expansion, to include a golf course, wooded areas with nature trails, and athletic fields.

Beginning in 1892 South Hadley embarked upon a development technique which spread through the town as more and more vacant land was developed. The first standard subdivision was planned at the location of Canal and North Main Streets. Despite being used in the town since 1892, the typical subdivision was not a land consumptive pattern until after the second world war. The post-war era marked the point at which that the rectilinear "cookie cutter lot" subdivisions became standard practice for most residential developers capitalizing on the pledge to provide a "decent home for every working American". This pattern is clearly represented by subdivisions off of Newton Street just north of the Falls Village area at Lincoln, Roosevelt, Washington, and McKinley Ave. This type of housing development forms the structure of development that exists today in South Hadley. Together, the aforementioned occurrences created the patterns which were instrumental in the evolution of the town as its character shifted from an agricultural town, to an industrial and commercial economy, and finally to the predominantly bedroom community that it is today.

3.3 Population Characteristics

The 1990 census report shows a current population of 16,685 for the town, a figure which is .4% lower than a 1988 projection reported by the Massachusetts Institute for Social and Economic Research (MISER). Although this represents a rise of only 1.7% over the decade between 1980 and 1990, recent MISER projections announce continued steady growth for the remainder of the century. (see Table 1 and Figure 2) This steady growth impacts all areas of public service as well as the availability of open space and recreational amenities. And as South Hadley population continues to rise slowly but steadily, there will be increased housing needs which will in turn induce increased building and development.

Table 1.

Population Trends and Projections (1970-2000)*

Year	Population
1970	17,033
1980	16,399
1990	16,685
1995	16,997
2000	17,310

Figure 2.

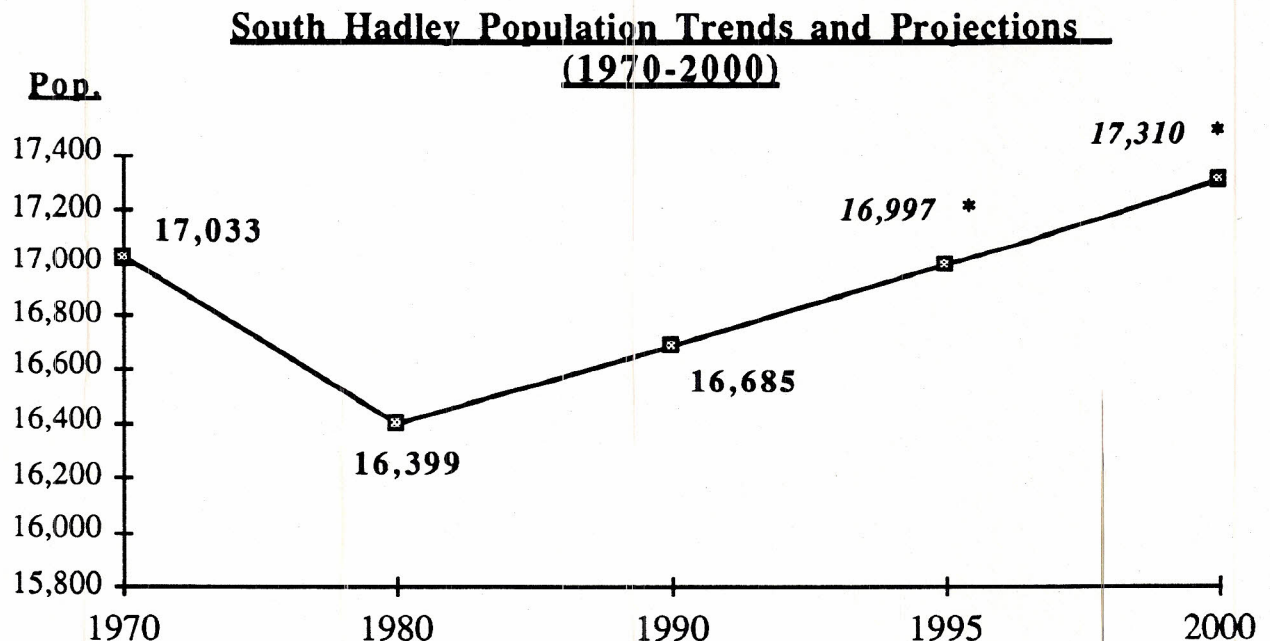


Figure 2 illustrates how the phasing out of Westover Air Force Base in the mid-seventies caused a significant drop in the local population. Unfortunately, the initial plunge in population due to this phenomenon has caused regional projections to appear somewhat "fuzzy" or skewed, and therefore produce misleading results. The recent MISER projections were constructed using population figures from the 1990 U.S. Census report, producing more accurate results and a better representation of the actual growth experienced in various departments (i.e., schools).

Approximately 40% of the total population currently falls into the 20-45 year old range (increased from 35% of the 1980 population), 35% in the 45+ age class (constant from 1980), and 20% within the 5-20 age bracket (compared to 25% in 1980). According to a 1991 census analysis produced by the Pioneer Valley Planning Commission (PVPC), the under 18 age population in South Hadley, comprising nearly 19% of the total population, has actually decreased by close to 12% between 1980 and 1990. (See Table 2) What this implies is that the town is experiencing an aging population and future open space and recreation planning should address the recreation needs of this maturing population.

Table 2. Population by Age Group

Population by Age Group

Age Group	1980		1990	
	Population	%	Population	%
0 to 4	689	4.2%	901	5.4%
5 to 9	804	4.9%	851	5.1%
10 to 14	1,115	3.7%	834	5.0%
15 to 19	2,361	14.4%	1,618	9.7%
20 to 24	2,115	12.9%	1,935	11.6%
25 to 44	3,641	22.2%	4,772	28.6%
45 to 54	1,787	10.9%	1,568	9.4%
55 to 64	1,935	11.8%	1,618	9.7%
65 to 74	1,214	7.4%	1,568	9.4%
75 +	738	4.5%	1,018	6.1%
Total	16,399		16,685	

According to a "Community Profile" for South Hadley prepared by the PVPC, the annual average income in South Hadley is slightly less than \$24,000 per capita, with the manufacturing and services industries employing close to 60%, and government and wholesale/retail trade comprising 34% of all South Hadley workers. The town is considered a so-called "bedroom community" by virtue of the fact that approximately 64% of the South Hadley labor force commutes to job sites located elsewhere in the region. Being a community within which people reside--where people return to at the end of the working day--there is naturally the need for increased recreational facilities which correspond to size and type of the growing population as represented by age group.

3.4 Growth and Development Patterns

The following sections are intended to examine past trends, and present some projected growth patterns which could ultimately have detrimental consequences if not anticipated and addressed through sound open space and recreation planning. These strategies will be suggested further on in this document.

3.4.1 Patterns and Trends

As was the case in many of the communities in and around New England metropolitan centers, the Town of South Hadley experienced intense development pressure as a result of the real estate boom of the late 1980's. Records of building permits issued within the town over the past ten years are a good indicator of the rate at which development has occurred (see Table 3). The table shows an approximate rise of 50% in issuance of all building permits from 1982 to 1983.

The number of multi-family permits continued to increase throughout the 1980's, but the number of new housing units dropped only slightly in 1986 due to increased attention to the one and two-family homes. From then until 1989 the number of housing units approved remained greater than 100 per year prior to a drop in 1990.

For the two years prior to the time of this writing (1992), the number of building permits for new homes has dropped consistently. The issuance of commercial building permits has not experienced as dramatic a reduction, however. This is probably due to the construction of the "Village Commons" retail center at South Hadley's center, a project developed by the trustees of Mount Holyoke College from a combination of fire damaged properties and adjacent college-owned land. Because of the initiative put forth by the college, this project was not derailed by the crash of the real estate market which occurred during the late 1980's.

Table 3.

Building Permits Issued Between 1982 and 1992

<u>Year</u>	<u>1 or 2-Family</u>	<u>Multi-Family</u>	<u>Commercial</u>
1982	12	0	2
1983	24	1 (20 units)	5
1984	30	1 (170 units)	5
1985	36	2 (90 units)	3
1986	112	0	1
1987	51	12 (82 units)	11
1988	31	11 (73 units)	6
1989	59	5 (52 units)	6
1990	79	4 (12 units)	6
1991	25	11 (40 units)	2

As expected, the above table shows a high number of permits issued for housing units during the late 1980's. The issuance of single family residential units peaked at 112 in 1986 and dropped to 31 by 1988. The table shows a slight rise in single family building permits through 1989 and 1990, primarily due to the single family detached condominium units developed at one location, The Alvord

Place Community. A total of six building permits were issued for multi-family structures (greater than two dwelling units per structure) in 1988, consisting of 35 units among them. The largest condominium occurred in 1984 with construction of the Riverboat Condominiums, adding 170 more dwelling units to the town's housing stock. Surprisingly, in light of the real estate slump since 1989, as recently as 1991 seven buildings, housing a total of 28 units, were added to the multi-family category.

There are currently over 100 plans approved for the development of single family units in South Hadley spread out among four new subdivisions as well as a number of individual single family dwellings being constructed in various, scattered locations around the town.

Consistent with the residential construction trend in the town of South Hadley and throughout the region as a whole, the number of commercial building permits reached its pinnacle in 1987, when eleven such permits were issued. In the following year the number dropped by forty-five percent and remained constant for the next two years. 1991 marked an eighty percent drop from peak commercial issuance during the period of the most recent five years.

Although the entire town felt the development pressures during this time, some areas experienced greater impact than others. As a result of the installation of a new sewer interceptor, the Alvord Street area has experienced the addition of 290 new dwelling units. According to a complete residential buildout scenario compiled in 1991 by a research team from the University of Massachusetts (CED, 1992), land exists in this area for an additional 308 units given the 40,000 square foot minimum lot size in this zoning district. One particular development along this corridor, The Alvord Place Community, has plans for 165 detached condominium units on an area less than 30 acres in size. This development is presently almost 50% built-out. Upon completion, the project will yield a net density of about five and one half units per acre.

Although the development surge may never again meet the level of the late 1980's, it will nonetheless impact the town's fiscal condition, environment, infrastructure, and community character. Now is the time to implement provisions for retaining space for the purposes of both passive and active recreation. The downturn in the economy and the crash of the real estate market may be viewed as a welcome break in the overbearing development pressures, and thus may be an opportunity for the town to develop sustainable land use strategies. Despite the fact that South Hadley has managed to retain agricultural land through the boom years, it is steadily becoming a more densely populated "bedroom community". Although the town has for decades been a community from which residents commute to neighboring cities by day and back to town in the evenings, the town's people should be

aware of mistakes made by other communities located on the fringes of highly urbanized areas. Often when a municipality does not equip itself for the protection and conservation of open land by identifying planning goals, there is little that can be done "after the fact" to prevent the conversion of the important open space parcels which may meet these goals.

3.4.2 Infrastructure

Transportation

Although the town of South Hadley does not have *direct* access to any of the major interstate highways, there is immediate linkage to Interstate 91 via Mass. Route 202 west through Holyoke and to Interstate 90 (Mass Pike) via Route 33 south through Chicopee. Routes 116 and 47 North provide northern direct access to other commercial areas and employment and educational centers (Amherst and Northampton). Due to the absence of major interstates and rail traversing South Hadley, the potential for large scale industrial development appears to be limited to the southern portion of town at locations nearest to the major transportation routes in Holyoke and Chicopee. On the other hand, transportation systems which are favorable in terms of commercial, light industrial and expanded residential development continue to exist throughout town.

The completion of the Route 116 County Bridge linking South Hadley Falls with the City of Holyoke, once scheduled for completion in 1994, is now delayed until 1996 due to confusion concerning environmental restrictions involving the protection of the short-nosed sturgeon, an endangered fish species. Upon completion, the bridge will provide increased access between the industrial section of South Hadley and Holyoke. This will increase mobility in and out of town and essentially serve as an economic asset to the town's business community. Conversely, this increased access to town will produce increased traffic impact on other town roadways. This could also contribute to the town's attractiveness for residential growth, particularly along Lathrop and Alvord Streets where a great deal of residential development has already occurred and is very likely to occur in the near future.

The Pioneer Valley Transit Authority (PVRTA) has regularly serviced routes linking the town with the cities of Springfield, Holyoke, and Chicopee as well as free bus service throughout the five college area linking South Hadley with the towns of Amherst, Hadley, and Northampton. The PVRTA also provides support for van service in and around the town for people with disabilities and senior citizens by providing the vans themselves and financial reimbursement of operation costs. In 1991 the PVRTA provided the town with \$33,930 toward operation costs of the transportation program provided in part by the South Hadley Council on Aging (South Hadley Annual Report 1991). This

program provided a total of 15,057 trips for people with disabilities and seniors in 1991, and constitutes a very important element of town service considering the growing elder population.

Water

Two separate water systems, designated by South Hadley's two fire districts, serve the town's potable water needs. Fire District #1 supplies the southern portion of town from the Chicopee line northward to Stony Brook and the intersections of Mosier and Newton Streets, Parkview East and Parkview Dr., Cypress and Westbrook, and across East Street into Granby. From here to the northernmost limits of the town residents are supplied by Fire District #2. The two systems are interconnected at five locations for emergency situations only.

With the exception of about twenty or thirty homes near the Riverboat Village Condominiums which are serviced by private wells, Fire District #1 receives most of its supply from the Quabbin Reservoir. The Town of South Hadley has a fifty year contract with the Massachusetts Water Resources Authority (MWRA) to receive up to two million gallons per day from the Quabbin Reservoir. Unfortunately this contract is due to expire in 1997. Most likely this contract will not be renewed, but will be rewritten on a one or two year basis and, most likely not for the present amounts. (South Hadley Fire District #1, 1992) Cost is another major deterrent for buying into another contract with the MWRA. The present cost of water from the Quabbin is \$43 per million gallons. The new price is said to have been fixed at \$2,000 dollars per million gallons.

For these reasons the town has for many years been seeking alternate sources of potable water, but has not been successful in locating aquifers of sufficient supply. The cost of providing both fire districts with water from Fire District #2 would require extensive upgrades to the interconnections between the two systems and pumping facilities, and may cost several million dollars to implement. For this reason the town should be careful about the amount of development authorized within the section of town comprising Fire District #1.

Fire District #2 is supplied by Lythia Springs Reservoir, two shallow wells known as the Elmer Brook Wells, and one deep well referred to as Dry Brook Supply which provides one third of the water supplied by the District. The other third comes from Lythia Springs and the shallow wells. Only twelve of the 5200 homes in the second fire district are drawing water from private wells. There appears to be no shortage in this supply at the present time. It would seem to support additional residential development at the current growth rate. Officials caution, however, that it has not been absolutely determined how much development this source will ultimately supply.

Sewer

The town of South Hadley currently operates a wastewater treatment plant which serves a total of 7,300 households including 240 in neighboring Chicopee. An average of 3.5 million gallons of raw sewage are treated daily. The facility is currently operating at approximately 75% of capacity, and has the potential of treating 4.2 million gallons per day. Full capacity of the wastewater treatment facility is expected by the year 1998, if the planned expansion to a 5.1 million gallons per day capacity is not implemented. At least 85% of the total suspended particles are removed, and the resulting sludge is disposed of in the town landfill. One of the improvements of the facility was the conversion of filter types which improved the manageability of the sludge and also reduced the amount of sludge being deposited at the town landfill by thirty-five percent. (South Hadley Annual Report, 1991) Improvements such as this imply that the town's sewage treatment plant will be able to absorb additional flows induced by increased development.

Although most of the town is serviced by the public sewer system, much of the area north of Bachelor's Brook is handled by private septic systems. This is due to the prohibitive cost of installing sewer infrastructure along the radically changing topography in the northern areas at the foot of the Holyoke Range. In recent years the town has completed much needed sewer improvements to the Blueberry Bend, Mosier Street and Granby Road Interceptors. The Blueberry Bend Project replaced a failed (substandard) pipe, and the Mosier Street Interceptor project provided much needed improvements to the sewer service in the central-eastern section of South Hadley.

The town received state and federal money for the purpose of expansions to the wastewater treatment plant under the conditions that South Hadley accept the Town of Granby into their sewer system. To date, the town of Granby has not made necessary improvements required for the hook-up with South Hadley's system. It is expected that at some point in the future this hook-up will be completed. Because the additional flows created by the construction of Pine Grove Condominiums spurred the recognition of the need for increased service to this area, the pending linkage of the two systems should be taken into consideration when planning for increased development in this section of town. According to engineers at the South Hadley Public Works Department, the only area along the town's sewer line which is currently at maximum capacity is the area of Morgan Street and Edison Drive where one of the interceptors is located.

The installation of a 30 inch sewer trunk line along the Connecticut River in 1976 resulted in the expanded development of the Alvord Street Corridor in an area of prime farmland. One subsequent result of installation of this new sewer interceptor was the conversion of 93 acres of once open agricultural land to single family residential use.

Although there has been no construction of homes occurring in the Stonegate subdivision to date, all necessary public infrastructure is in place and the project is expected to gain approval shortly. In a recent study, a team of graduate students from the University of Massachusetts reported that a maximum build-out of the Alvord Street corridor would produce an added 200,000 gallon per day increased flow to the existing sewer system. The study concluded, however, that this addition would easily be handled by the current collection and treatment facilities (CED, 1992). A note of warning: despite a preponderance of Chapter 61A agricultural use land located along the Connecticut River and the current refusal of owners to sell, there is no guarantee that the land will remain in agricultural use forever. The infrastructure stage is set for further development should these present owners decide to transfer their land out of agricultural use.

3.4.3 Long-term development patterns

The nature of South Hadley's regional location within a transition zone between major urban centers to the south and more rural agricultural communities to the north is what drives the force of change in town. Viewing long-term development patterns from today's standpoint in time we see that it is not a rapidly moving part of the private real estate market. When future changes occur in the regional economy, however, the town could experience substantial undesired development.

South Hadley's zoning bylaws give a rough indication of how future development will occur in the years to come. For example, under the dimensional requirements schedule of the South Hadley zoning bylaw for Residential A-1, a maximum lot coverage is limited to 30%, lot size is limited to a minimum of one half acre lots, and for specially permitted properties (i.e., churches, schools), building lots are required to be a minimum of two acres. Under agricultural zones, thirty thousand square feet is the minimum lot size, and 30% is, again, the limited lot coverage. To illustrate, the Alvord Street corridor, with the exception of the "Industrial Garden", is primarily zoned Residential A-1 and Agricultural. Under this zoning, the landscape along Alvord Street may be drastically altered from its present open farm landscape to one cluttered with extensive single family residential use. This sharp contrasting change has already been experienced, as four very large subdivisions are on their way to completion and will consume 176 acres of the town's open space acreage. Figures produced by the Alvord Street Corridor Research Team have showed that 285 acres along the Alvord Corridor currently remain in an unprotected open space status.

Section 4 - Environmental Inventory and Analysis

4.1 Geology & Soils

[Note to Open Space Planning Committee: we encourage you to include in the text any examples of soil and geological phenomena which are specific to South Hadley. Site-specific information would serve to strengthen this section.]

The geological history of South Hadley is both dramatic and significant. Continental drift, the formation of the Appalachian Mountain chain, volcanoes and glacial scouring, have all played a role in the physical development of this area of the Connecticut Valley. Geology has influenced the topography and soils which in turn have determined surface and ground-water characteristics, forest cover and finally land use.

During the Triassic Period (220 to 180 million years ago), two faults formed on either side of what is now the Connecticut Valley. The forces of continental drift pulled these faults apart causing the land between to drop and form the Triassic basin (the Connecticut Valley). The subsequent geological activity formed the topography, rocks and soils of the Valley and are why present-day South Hadley has its landscape characteristics. Figure 3 shows a cross section of the sedimentary and igneous rocks in the Range and Valley and is a good reference for the following discussion.

Sugarloaf Arkose

Sugarloaf Arkose was the first deposit in the Triassic basin. It arrived from streams in the east which first deposited larger rocks in the eastern portion of the Valley and then dropped smaller rocks gradually westward as the streams slowed. It is a buff to pale red sandstone that gets its color from iron found throughout the cement of this sediment.

Hitchcock Volcanics

The Triassic era was unusually active with volcanoes. Lava from these volcanoes is manifested in different forms such as the Hitchcock Volcanics. These are stacked, volcanic cones that shot up through the early, uncemented arkoses. The arkose mixed with the bases of the cones which formed sections of diabase (a dark igneous rock).

Holyoke Basalt

This rock is one of the most prevalent in the Holyoke range today and has been quarried for use in road beds. It is also called diabase or traprock. It is reddish brown with feldspar crystals when it is weathered and light to dark gray when freshly exposed. Most Holyoke basalt was formed from a lava flow that extended southward through the basin while smaller amounts spread east and west

against alluvial fans. The thickness of the flows range from 100 to 700 feet. A phenomenon known as columnar jointing occurred when the basalt cooled from its parent lava. These are hexangular joints or cracks that occur perpendicular to the cooling surface. **Titan's Piazza** in South Hadley is probably the best example of columnar jointing in the Range.

Second Sugarloaf Arkose

This arkose is much like the first but was formed after Holyoke basalt came into existence. The sediments in the second are coarser as well. This is due to the fact that westward flowing streams at this later date were running at great volume and were able to carry heavier material. Second Sugarloaf arkose outcrops are found only on the south side of the Range.

Granby Tuff

Granby Tuff is made up of volcanic ash and fragments, crumbles easily and is darkly colored. Like the Second Sugarloaf arkose, it occurs on the south side of the Range. Purer layers resulted from violent, volcanic eruptions while mixed fragments indicate formation from quieter lava flows. The tuff can be up to 1000 feet thick.

Intrusions

Sills, dikes and pipes of fine grained diabase bisect the Granby tuff and nearby sedimentary material. These intrusions are between 15 and 200 feet in diameter and rise 10 to 30 feet above the tuff surface. South Hadley's **Black Rock Dike** is the largest intrusion in the Range.

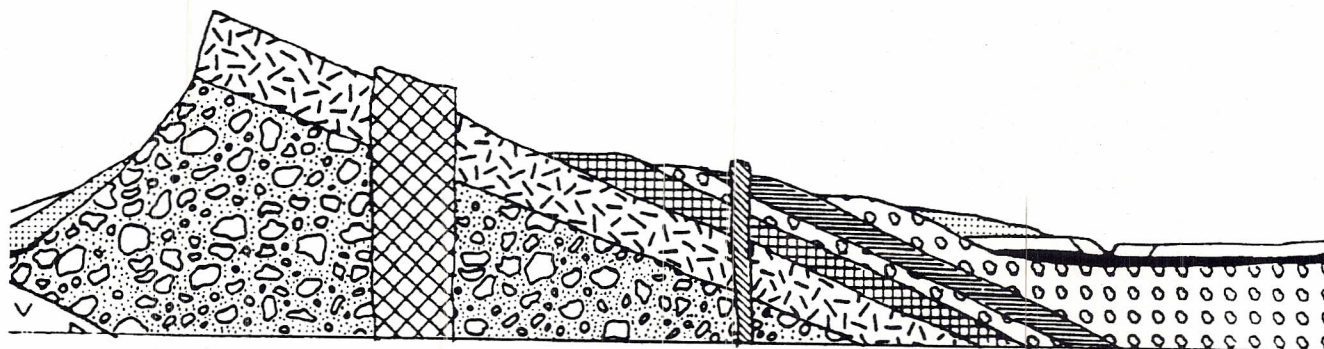
Longmeadow Sandstone (or the Portland Formation)

Many of the brownstones in New York City are constructed from this valuable sandstone. It is a brownstone containing quartz and iron oxide cement. Layers were deposited before and after the Granby tuff and may be 2000 feet thick at one point.

Chicopee Shale

This rock is found just south of the Holyoke Range and was formed toward the end of the Triassic Period. It is finer grained than the sandstones below. The Triassic Period laid the geological foundation for what was to develop millions of years later. The Pleistocene Era, or what is commonly referred to as the ice age, arrived approximately 1 million years ago and lasted until roughly 7,000 years ago. Glacial advance and retreat during this period had a significant effect on the Valley and Range. The glaciers came in thicknesses of up to 10,000 feet scouring and carrying Triassic bedrock, clay and sand.

Figure 3. Generalized Cross-section of Holyoke Range showing major rock formations and deposits (as viewed from the west; portions adapted from Randall, 1962.)



ALLUVIUM



VARVED CLAY



DELTAIC AND
LACUSTRINE
FINE SILTS AND
SANDS



GLACIOFLUVIAL
DEPOSITS



LONGMEADOW
SANDSTONE



BLACK ROCK
DIABASE



DIABASE PLUG



GRANBY TUFF



SECOND ARKOSE



HOLYOKE BASALT



SUGARLOAF
ARKOSE



PALEOZOIC
BASEMENT



Till deposits (the unsorted "mix" of clay, silt, sand and boulders deposited by glacial ice) can be found on both sides of the Holyoke Range today. A dam of till was formed on the Connecticut River just north of Middletown, Connecticut at Rocky Hill during one glacial retreat. This formed a series of lakes known collectively as Lake Hitchcock that extended 160 miles north to Lyme, New Hampshire. Except for seasonal flooding, Lake Hitchcock provided the most recent important sediments in the Valley. Deltaic and Lacustrine fine sands and silts were deposited on the interior Valley floor. These deposits have contributed to the rich, alluvial soils that predominate the "tabletop" farmlands of the region.

In terms of development constraint, soils can be considered to be the most critical element of the physical environment, the understanding of which can help the community to decide, for any given location, which land uses are realistic and which are not. Therefore, careful attention to the various properties and geographic concentrations of soils can prove to be an advantage in planning for a community's open space and recreation needs.

The U.S. Department of Agriculture, Soil Conservation Service (SCS) makes soils information available in the form of soil surveys, of which Soil Survey of Hampshire County, Massachusetts, Central Part provides the reference material for South Hadley. Although the SCS maps many different soil classifications for the town land base, it is helpful for our purposes to distinguish between the various so-called "soil associations". These are groups of soils named for the dominant soil type, and characterized primarily by common geographic patterns, parent material, and limitations for particular uses. (see Special Landscape Features Map, Appendix G and see Figure 4, "Estimated Limitations of Soils for Specific Uses")

The brief references to limitations contained in the discussions below are intended to provide a general guide only. Due to the wide variation of potential recreation development, reference to the SCS Soil Survey should always precede the design of any specific recreational or open space project. The SCS recognizes four soil groups or associations for the Town of South Hadley, as follows:

Roughly 38% of the town is underlain by the **Hinkley-Merrimac-Windsor** association concentrated primarily in the eastern and southern sections of town, and including the village of South Hadley Falls. The Hinkley and Windsor components are described as excessively drained, droughty soils, upon which plant growth is limited by the lack of available moisture. Despite the poor filtering capabilities of these soils for on-site septic, all of this association is currently in residential or commercial uses supported by an existing public sewer system. Few limitations exist

for forest management operations in this soil group, with the exception of those associated with tree growth itself. Conditions in this association are described by SCS as excellent for most recreational development.

The moderately well to poorly drained **Amostown-Scitico-Boxford** group represents roughly 34% of the soils of South Hadley. These soils are concentrated in the lowlands which spread eastward from the Connecticut River, and are predominantly loamy and clayey soils formed in postglacial outwash, that is, sorted material deposited by glacial meltwater, or "lacustrine sediments". Though most of the association is in agricultural or forest use, it is described by the SCS as limited for building and on-site septic due to wetness and slow permeability typical of the Scitico component. In general, there are limitations for recreational development in this association, especially with regards to actual construction, due to soil saturation conditions. To be successful, the scheduling of forest management operations may need to be limited to times of frozen ground conditions to be successful.

The **Rock outcrop-Narragansett-Holyoke** association covers approximately 22% of the town landbase located primarily at the northern (essentially the south-facing slopes of the Holyoke Range) and southwestern sections of the town. This grouping is characterized by high, massive ridges, and shallow to bedrock conditions typical of the Holyoke soils component. This group is also a result of glacial ice deposition. All of this association is currently in forest use, with severe limitations for residential development, as described by the SCS. The Soil Survey rates this association moderate to severe for forest management purposes, primarily due to steep slope conditions. Mitigating measures to protect these soils against erosion are necessary for successful forest management. Recreational development will be limited to trail system and associated construction, with particular attention to erosion potential.

Approximately 4% of the town falls into the **Gloucester-Montauk-Paxton** association, soils which are deep, well and somewhat excessively drained, sandy and loamy, and formed in glacial tills. This grouping is confined to uplands along the eastern boundary which South Hadley shares with Granby. Most of this association is currently in forest use, and is described as having severe limitations for building and on-site septic due to the existence of surface stones. Limitations are slight to moderate for forest management in this association. A preponderance of small to large surface stones could be the primary drawback to development of recreational facilities.

Finally, 2% of the town of South Hadley land base is underlain by the **Hadley-Winooski-Limerick** association which is characterized by deep loamy soils formed in alluvial material, typical

of the floodplains within the Connecticut Valley. This association consists of well drained Hadley soils, moderately to well drained Winooski soils, and the more poorly drained Limerick soils, located in depressions throughout the northeastern section of town. Limerick soils are those which exhibit high water table conditions. This association is generally suited to tree and crop growth. This soils group is limited, however, for building purposes due to its propensity for flooding and wetness.

Figure 4. Estimated Limitations of Soils for Specific Uses

Estimated Limitations of Soils for Specific Uses

Soil Name Association	Uses								
	Farming	Forest Management	Recreation Facilities	Recreation Trails	Open Land Wildlife Potential	Woodland Wildlife Potential	Wetland Wildlife Potential	Building	On-Site Septic
Rock outcrop-Narragansett-Holyoke	Severe	Slight-Mod.*	Severe	Slight	Poor	Fair	Very Poor	Severe	Severe
Amostown-Scitico-Boxford	Slight	Slight*	Mod.-Severe	Severe	Fair	Fair	Poor	Severe	Severe
Hinkley-Merrimac-Windsor	Mod.	Slight	Slight	Slight	Fair	Fair	Very Poor	Slight	Severe
Gloucester-Mantauk-Paxton	Severe	Slight-Mod.	Mod.	Slight	Good	Good	Very Poor	Mod.-Severe	Severe
Hadley-Winooski-Limerick	Slight	Slight	Severe	Mod.	Good	Good	Poor	Mod.	Severe

Slight* - Except on saturated soils where windthrow potential & access limitations exists.
Slight-Mod.* - Erosion Potential.

4.2 Water resources

The town of South Hadley falls within the 11,250 square mile **Connecticut River Basin** and enjoys the distinction of marking the dramatic transition between the primarily agricultural and predominantly industrial segments of the Massachusetts portion of the river. (see Water Resources Map, Appendix G)

Within the boundaries of South Hadley run two major waterways, **Bachelor and Stony Brooks**, flowing westward through town, from neighboring Granby to the Connecticut River. **Elmer and Dry Brooks** run southward from the slopes of the Holyoke Range to the river. Finally, **White and Buttery Brooks** feed into the Connecticut River from wetlands in the south section of town. Major open water bodies include **Upper and Lower Ponds** within the Stony Brook waterway in South Hadley center. The Buttery Brook corridor includes 9.8 acres of publicly owned greenbelt within the total 29.2 acres of Buttery Brook Park, the town's most popular recreation area. It should also be mentioned that a canoe launch or dock has been recently constructed and is available for public use at Canal Falls Park.

The inhabitants of the Town of South Hadley derive their potable water supply from both surface and ground water sources, administered by two separate political bodies, Fire Districts #1 and #2. District #1 serves approximately 70% of the town, as well as sections of both Granby and Ludlow under a 45 year contract to purchase MDC Quabbin Reservoir water until the year 1998. Within this district two water sources, **Leaping Wells and Buttery Brook Reservoirs**, were abandoned circa 1950 due to poor water quality, in favor of the currently operated hookup to Quabbin via the Chicopee Valley Aqueduct system which went on line in 1952.

The present 3.8 mgd (million gallons per day) allowable pumping level, or contractual limit, is considered adequate to meet usage levels until the year 2000, given that average daily consumption is reported to be considerably lower. (10/28/92 phone conversation with John Waller, Superintendent, Fire District #1) The remaining 30% of South Hadley is supplied by Fire District #2, including **Lythia Springs Reservoir** and three groundwater sources in the north section of town, **Dry Brook Well and Elmer Brook Wells 1 and 2**.

The lion's share (approximately two-thirds) of water supplied from this District is pumped from the 108' deep Dry Brook Well which draws approximately 920 gallons per minute from saturated sand and gravel deposits sandwiched between the approximately 80' of confining clay layer above, and impervious bedrock below. The balance of District #2 supply is provided by a combination of the

Lythia Springs Reservoir (a man-made water impoundment with a 40 million gallon holding capacity) and Elmer Brook Wells 1 and 2, each measuring 12' deep and 30' in diameter. Although rated together for a safe yield of 300,000 gallons per day, these three sources currently provide approximately 180,000 gallons per day of drinking water. This actual yield is expected to increase 20% in the near future as pumping duration increases from 8 to 24 hours per day to allow for a more effective chlorine treatment in compliance with state surface water treatment regulations. (10/28/92 phone conversation with Bill Selkirk, Superintendent, Fire District #2)

4.2.1 Flood Hazard Areas

Extreme flooding in 1982 resulted in the loss of the Black/Stevens Dam and subsequent draining of the upper pond, and siltation of the lower pond. The boundary where there is a 1% chance in any given year that floodwaters will reach (the 1% flood zone) is represented in the Water Resources Map, Appendix G.

4.2.2 Wetlands

It is no surprise to anyone that wetlands can play an important role in any community. They have such functional values as flood control, aquifer recharge and discharge, pollution control, fish and wildlife habitat, increased biodiversity, recreational use and aesthetic appreciation. The Water Resources Map in Appendix G shows the areas of forested and non-forested wetlands in South Hadley. The floodplain forest along the Connecticut River and the mouths of Bachelor and Stony Brooks are of great value to the town (see a complete discussion of floodplain forest in section D. Vegetation). The southeast corner of town also has extensive wetlands and unique pine barren-like habitat that could have some recreational potential for trail users and bird watchers. White Brook, east of River Road, is one other area of special consideration. This location includes many acres of relatively undisturbed wetlands, but is under pressure from future development potential. The town may want to determine this area's importance as an undisturbed wetland.

4.2.3 Aquifer Recharge Areas

The bedrock and soils of the Holyoke Range constitute a major watershed recharging the aquifer and water supply reservoirs of surrounding communities. The aquifer overlay district is shown in Appendix G.

4.3 Vegetation

4.3.1 Forest land

Forest is a major part of the open space picture in Massachusetts. The 1988 USDA Forest Service publication, **Forest Statistics for Massachusetts - 1972 and 1985**, reports that, while cropland and pasture comprise 5.3% of the state land base, **Massachusetts forest** covers over **2.9 million acres** and represents over **64%** of the total land area. If Massachusetts Audubon Society projections of open space consumption (over 2 million acres by 2030 based on current rates) prove correct, the lion's share of **conversion** will likely occur in our state's forest environment. In addition, the Massachusetts forest is undergoing **fragmentation** into an ever increasing number of ever smaller private ownerships causing a nightmare for the planning, protection and management of our forest recreation, watershed, aesthetic, products, and wildlife functions. In many cases, the fragmentation of forest ownership into many smaller parcels marks a prerequisite to conversion. This will result in the **fragmentation** of larger forest tracts into ever smaller parcels, causing the disruption of the necessary functions performed by our forestland.

The **South Hadley forest** covers approximately **6,965 acres** and represents over **59%** of the total town land base of 11,781 acres. According to the June, 1991 Mass. Agricultural Experiment Station Research Bulletin #735 Forest Productivity Mapping of Massachusetts, of the 6,965 acres of forest in South Hadley, 55.7% of is considered of prime productivity for growing Eastern White Pine (Pinus strobus) and Red Oak (Quercus rubra).

The many **functions of forest use** are well documented (Report of the State Forestry Committee on Minimum Forest Cutting Practices Regulations). The State's primary forest activity, **recreation**, is critical for a state ranked 4th in the nation in population density.

The **watershed** function of the forest involves the sheltering of South Hadley water supplies by regulating the amount of water, its flow and quality. Watershed protection is an important characteristic of forest cover in South Hadley.

Streamside stands remove excess nutrients and sediment from surface runoff and shallow groundwater. They also shade the town's streams and the Connecticut River to optimize light and temperature conditions for aquatic plants and animals. Streamside forest buffers against some pesticides and provides organic food to maintain the biological integrity and diversity in the adjacent stream. Figure 5, "Streamside Forest Buffer", describes these characteristics as well as management considerations for water resource protection.

The South Hadley forest serves an important **wildlife habitat** function as home to a large and diverse population of mammals, birds, reptiles amphibians and fish both within the Holyoke Range ecosystem, as well as in the floodplain forest along the Connecticut River.

The **scenic quality** of forestland defines the "rural character" of a Holyoke Range community like South Hadley. **Forest production** according to sound management principles is critical to local economies and open space retention. In many cases keeping the land productive is the key to keeping the land "open". In addition, this planned productivity may have the profound effect of "tying-up" carbon which would otherwise be released into the atmosphere, into useful products such as wood bridges, furniture and buildings.

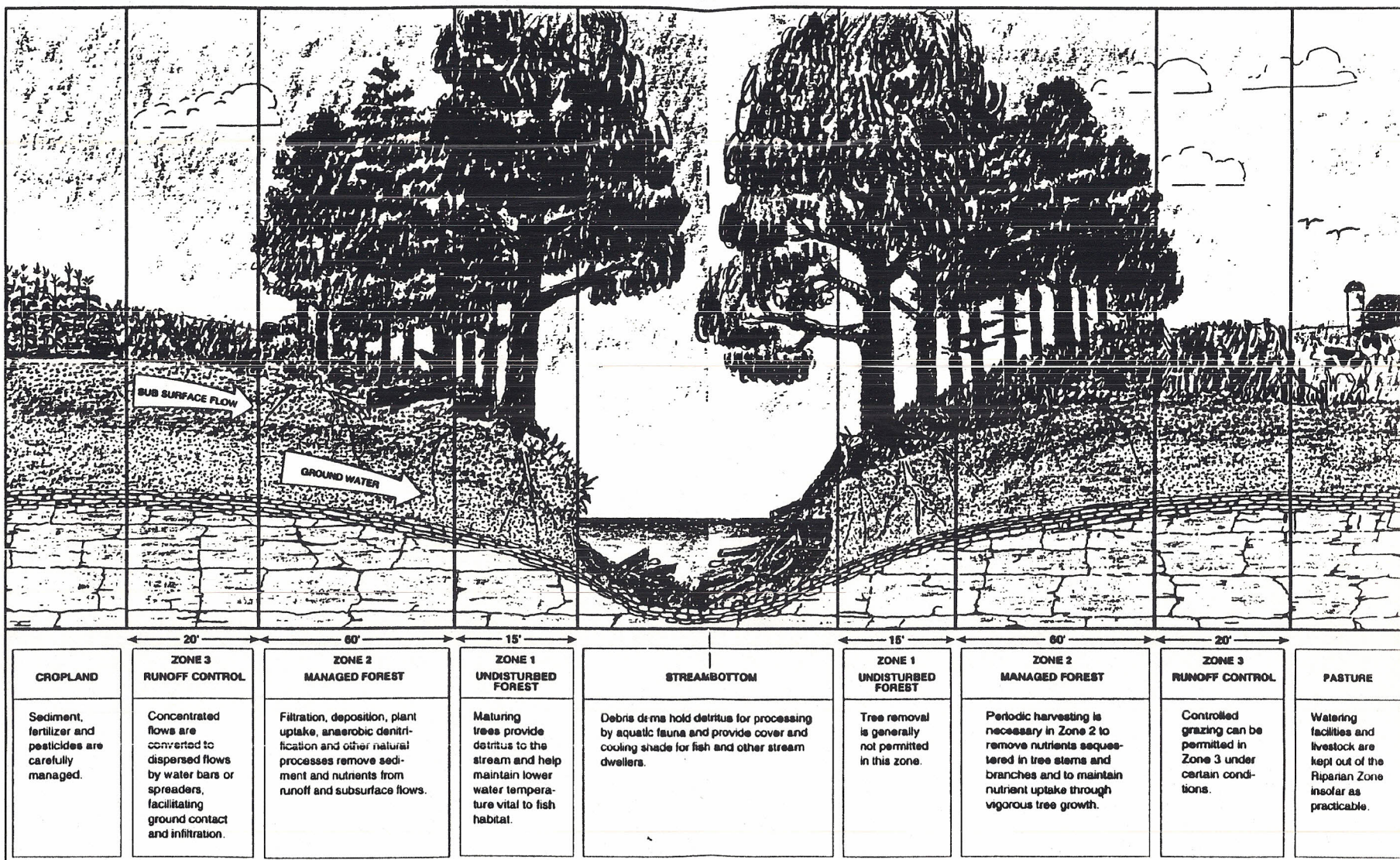
Forest cover affects **air quality** in many ways. The forest filters particulates from the air, shades and cools forest interiors through evapotranspiration, and reduces wind and consequent drying. It is also becoming widely recognized that forests may play an important role in helping to mitigate the effects of global warming. Every forest parcel is part of a regional and global "system" which both affects, and is affected by temperature and air quality on a much larger scale.

The above describes the various forest **functions** which are, in fact, integral parts of each other, functions which are often misinterpreted as forest **uses**, such as wildlife use, recreation use, etc. In fact, the functions are interrelated and cannot be separated out from the whole. The "use" itself is forest.

MGL Chapter 61, the Massachusetts Forest Tax Law, represents the best state-level effort to maintain forestland productivity through local use assessment and sustained-yield management planning. This program offers forest landowners the option of reduced taxation, emphasizing the long-term nature of forest growth rather than short-term building lot value, in exchange for carrying out activities outlined in a forest management plan. The local communities also benefit.

The town of South Hadley is entitled to bill for and receive an 8% tax on all products removed from these "classified" lands, as well as a 120 day first refusal option to purchase the land upon notification that a particular forestland parcel will be converted to another use. This aspect of the program is obviously important as part of South Hadley's overall open space planning strategy.

Figure 5.-THE STREAMSIDE FOREST BUFFER



The Forest Tax Law program is usually a reliable measure of a community's efforts at retention of land in forest use. Based on the most current data, however, the total amount of forestland managed under the authority of this planned program in all of South Hadley is negligible; currently **42 acres** or **0.6%** of total town forestland (1990. "Chapter 61/61A 1990 Statistical Report". Mass. Department of Environmental Management). Opportunities exist to encourage more South Hadley landowners to participate, especially within the scope of open space planning.

To date, a number of South Hadley citizens have participated in the Massachusetts COVERTS Project, an annually held, intensive three-day program designed to instruct volunteer board and commission members in all aspects of forest resource management. The intention is for these individuals to become conduits through which this information filters down to the local level. This group will provide a good basis for promotion of the Forest Tax Law as a forestland protection and production tool for the town of South Hadley.

4.3.2 General Inventory

In general, the forest cover in South Hadley is typical of that found in central New England and the Connecticut River valley. The warmer, south slopes of the Holyoke Range grow a forest with a predominantly oak-hickory composition including Northern Red Oak (*Quercus rubra*) and Shagbark Hickory (*carya ovata*), in direct contrast to the hemlock-white pine-northern hardwood mix found on the cool, moist northern slopes of the range.

In addition to the above, typical species throughout South Hadley include Eastern Hemlock (*Tsuga canadensis*), Yellow Birch (*Betula lutea*), Paper Birch (*Betula papyrifera*), as well as White Pine (*Pinus strobus*), Red Maple (*Acer rubrum*), Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), White Ash (*Fraxinus americana* L.), Balsam Fir (*Abies balsamea* L.) and red and White Spruce (*Picea glauca*). Associated understory vegetation and ground cover include such plants as Common Witch-hazel (*Hamamelis virginiana* L.), Viburnums (*Viburnum* sp.), Lady's-slipper Orchids (*Cypripedium reginae*), trilliums (*trillium* sp.), Tree Club Moss (*Lycopodium obscurum*), Canada Mayflower (*Maya canadensis*), Mountain Laurel (*Kalmia latifolia* L.) and Teaberry (*Gaultheria procumbens*).

During the Industrial Revolution of the 19th century, wood from the range fed the kilns which baked the bricks for mill construction in Holyoke and South Hadley. The eventual use of oil and coal for fuel served to ease the pressure on the range forests, allowing them to regenerate. Today, the forest and adjacent agricultural land provide the town with a pleasant landscape and visual link to its past, a

good supply of timber, wildlife habitat, climate moderation, erosion control in the Range and watershed protection in the lower, wet areas.

The Connecticut River riparian zone contains a unique forest type especially adapted to the seasonal spill of water over the river's banks; the so-called northern floodplain forest. This special forest composition exists in successive waves of vegetation out from the river and into the floodplain. The first flank is comprised primarily of the Willows (*Salix* sp.) and Green ash (*Fraxinus pennsylvanica* var. *subintegerrima*) which survive the immediate riverside environment to stabilize the river's banks. Farther out on the low ridges of heavy coarse sediment created by river flooding, grows the Eastern Cottonwood (*Populus deltoides*), which pushes taproots deep into the alluvium soil. A relatively undeveloped shrub or intermediate layer of vegetation can be seen beneath the sheltering canopy of the cottonwood, due in large part to both the shade of the overstory and the scrubbing effect of river flooding. Seedlings of Silver Maple (*Acer saccharinum* L.), Elms (*Ulmus* sp.), Ashleaf Maple (*Acer negundo*), and White Ash can be found here, as well as Ostrich Fern (*Pteritis pennsylvanica*), Cinnamon fern (*Osmunda cinnamomea*), grasses (*Graminaea* sp.) and sedges (*Carex* sp.), depending on the light levels in a given area of the forest floor. Grapevines (*Vitus* sp.) and American Black Currant (*Ribes americanum*) are among the prolific understory plants in this section of the floodplain. Still farther back from the river, tree species such as Sycamore (*Platanus occidentalis*), Sour Gum (*Nyssa sylvatica*), Tulip-poplar (*Liriodendron tulipifera* L.), Red Maple and American Beech comprise the overstory. These species grow close enough to the river to be rooted in moist floodplain soils, yet far enough away from serious flooding.

4.4 Fisheries and Wildlife

Typical wildlife found in South Hadley includes such species as the Eastern Cottontail (*Silvilagus floridanus*), Beaver (*Castor canadensis*), Northern Flying Squirrel (*Glaucomys sabrinus*), Gray Squirrel (*Sciurus carolinensis*) Virginia Opossum (*Didelphis virginiana*), Wood Thrush (*Hylocichla mustelina*), Mourning Dove (*Zenaida macroura*) and Downy Woodpecker (*Picoides pubescens*), to name only a few.

The larger areas of contiguous forest land in the northern portion of town can also be home to White-tailed Deer (*Odocoileus virginianus*), Bobcat (*Felis rufus*), Red Fox (*Vulpes vulpes*), Wild Turkey (*Meleagris gallopavo*), Ruffed Grouse (*Bonasa umbellus*) and Pileated Woodpecker (*Dryocopus pileatus*).

Wetlands and the northern floodplain forest (found in such areas of town as the mouths of Bachelor and Stony Brooks and along the Connecticut River) are important habitat for a great variety of wildlife species. The **Bald Eagle** (*Haliaeetus leucocephalus*) is on the top of this list. This legally protected bird relies on the relatively undisturbed waters of the Connecticut River for forage and nearby tall evergreens for nesting. Although there are no known nesting pairs in South Hadley at this time, potential areas for such activity presently exist within town boundaries. Other floodplain wildlife includes the Wood Duck, (*Aix sponsa*) Great Blue Heron (*Ardia herodias*), Red-winged Blackbird (*Agelaius phoeniceus*), Silver-haired Bat (*Lasionycteris noctivagans*), Mink (*Mustela vison*), Spotted Turtle (*Clemmys guttata*), Red-spotted Newt (*Notophthalmus v. viridescens*) and Wood Frog (*Rana sylvatica*).

Bachelor Brook, Elmer Brook, Stony Brook and particularly the Connecticut River are all important fisheries resources for the town. The Massachusetts Division of Fisheries and Wildlife has identified 37 fish species in the Massachusetts portion of the lower Connecticut River. Common species include largemouth bass (*Micropterus salmoides*), pickerel (*Esox sp.*), bullhead catfish (*Ictalurus nebulosus*), carp (*Cyprinus carpio*), suckers (*Catostomus commersoni*), bluegill (*Lepomis macrochirus*) and yellow perch (*Perca flavescens*). Migrating shad (*Alosa sp.*) arrive in great numbers in the spring and the federally-designated endangered **shortnose sturgeon** (*Acipenser brevirostrum*) has a significant breeding population in these waters. Atlantic salmon (*Salmo salar*) also make their way from the Atlantic and up the Connecticut River every spring.

According to the 1992 edition of the "*Atlas of Estimated Habitats of State-listed Rare Wetlands Wildlife*", the Massachusetts Natural Heritage Program has currently identified three areas that bear special consideration in the design of development projects in South Hadley. The entire 6.6 miles of Connecticut River riparian zone is considered protected wetland wildlife habitat. In addition, both the area along Lythia Springs Road between Lythia Springs Reservoir and Elmer Brook, and the Moody Corner section of town, south of Pearl Street along Bachelor Brook, are included in the atlas. Under provisions of the Massachusetts Wetlands Protection Act, any proposed activity within the habitat boundaries outlined in the atlas is to be reviewed by the Natural Heritage and Endangered Species Program for potential impact and possible modification of the project.

The town of South Hadley should pay considerable attention to proposed development along the Connecticut River. The two protected species mentioned, the bald eagle and shortnose sturgeon, depend on waterways that are relatively uncontaminated from non-point and point source pollution and on a somewhat contiguous buffer along the river's banks. The river also acts as an important nesting and feeding area for migrating waterfowl in the Atlantic flyway. The town should also be

careful to maintain the contiguity of its forest land in the northern part of town. Further development could result in fragmentation and elimination of habitat for a number of species.

4.5 Scenic Resources and Unique Environments

4.5.1 Scenic landscapes

According to the 1981 Massachusetts Landscape Inventory, most of the southern slope of the Holyoke Range within the town of South Hadley is considered Class A "Distinctive" by virtue of the visual quality of this landscape. Approximately one-third of the town east of the Connecticut River is described as Class B "Noteworthy" (see Special Landscape Features Map, Appendix G).

4.5.2 Major Characteristics or Unusual Geologic Features

Titan's Piazza and the Black Rock area (see Section 4.1 Geology).

4.5.3 Cultural and Historic Areas

The town of South Hadley has two significant Historic Districts which contribute to the town's character. On March 1, 1992, the National Park Service placed the South Hadley Canal District including one piece of property located at 315 River Street on the National Register of Historic Places commemorating the rich history of this engineering and cultural wonder. (included in Section 3.2 Historical Overview) Also significant to the town's historical and cultural resources is the Woodbridge Street Historic District which was established and added to the list of properties of the Massachusetts Historical Commission on November 14, 1983 and includes properties at the following locations:

7 Silver Street - Rev. John Lovell, Willard House	25 Woodbridge St. - Daniel House
28 Woodbridge St. - The Sycamores	28 Woodbridge St. (the water tower)
29-31 Woodbridge St. - Lyman House	32 Woodbridge St. - Graves House
33 Woodbridge St. - Skinner Museum	35 Woodbridge St. - White, Joseph III
36 Woodbridge St. - Skinner-Harris House	40 Woodbridge St. - White, Dea. J. House
41 Woodbridge St.	43 Woodbridge St. - Clark Isreal House
48 Woodbridge St. - Skinner	49 Woodbridge St. - Chapin House
51 Woodbridge St. - Tinkhas House	53 Woodbridge St.
61 Woodbridge St.	63 Woodbridge St. - Montague House
64 Woodbridge St. - White Cyrus House	68 Woodbridge St.
69 Woodbridge St.	70 Woodbridge St.

71 Woodbridge St. - Seith-Stein House

72 Woodbridge St. - Munn House

73 Woodbridge St.

77 Woodbridge St. - Saith, Arthur House

78 Woodbridge St. - White, Maj. J. Sr. House

82 Woodbridge St. - White J. Sr. House

This district pertains to most of Woodbridge Street north of the South Hadley Post Office at the town's center.

4.5.4 Areas of Critical Environmental Concern

No Areas of Critical Environmental Concern have been designated by the state as yet.

4.6 Environmental Problems

The town of South Hadley currently has some sites that are under Chapter 21E classification by the Department of Environmental Protection (DEP). The Chapter 21E legislation is an 18 section law entitled the Massachusetts Oil and Hazardous Materials Release Prevention and Response Act (the Massachusetts Superfund Law) and was enacted in 1983. Chapter 21E parallels the Federal Water Pollution Control Act and the Comprehensive Environmental Response, Compensation and Liability Act and requires that DEP secure all the benefits of these and all other pertinent federal laws. There are five stages of site assessment for properties listed under Chapter 21E. The first phase is the Preliminary Assessment step which determines whether a site is hazardous or not, whether immediate measures need to be taken or whether further remedial action actually needs to occur. South Hadley has a few properties in Preliminary Assessment at the time of this writing.

Those sites that require continued action proceed to the second phase or the Comprehensive Site Assessment which inventories and assesses all environmental hazards. This step determines the type and quantity of hazardous material, the extent and nature of the contamination and evaluates the risk to public health and the environment. There are only a small number of sites in town in this phase of review and all but one of them are considered non-priority.

The landfill is the one property that is classified as "priority phase 2". As of November 2, DEP had determined that this site is, in fact, leaking oily substances and 1,4 dioxane and is a possible danger to water supply. BATTERY Brook, BATTERY Brook Park, its associated pond and other appropriate locations have been posted to alert the public to avoid using these waters for recreational purposes.

A couple owners of private water supplies in the proximity have been notified and offered municipal hook-up.

The board of health had also indicated in July of 1992 that others in the area were being warned of the possible risks to potable and non-potable water alike. Phase three involves the Development of Remedial Response Alternatives and the Final Remedial Response Plan. As the title suggests, this phase should develop response alternatives and recommend the best for approval by DEP. These alternatives can be classified as on-site treatment, off-site treatment, on-site containment or disposal, off-site disposal or no action.

The fourth and final phase of the process is the Implementation of Approved Remedial Response Alternative. Phase four involves the development of the plan and the construction, operation and maintenance of the proposed remedy. This step must also involve preparation of the final inspection report for the completed project.

All information for specific Chapter 21E sites is available for public review. Any questions about this process for citizens of South Hadley can be directed to DEP's Western Region office in Springfield at (413) 784-1100 extension 214.

Section 5 - Inventory of Lands of Conservation and Recreation Interest

This section contains an inventory of open space and recreational lands. This inventory was done in a three step process. First, the church owned parcels were designated by location, map number and acreage; they were not assessed by any additional criteria (see Church Affiliated Property, Appendix H). The second step included an inventory of private, public and non-profit lands by owner, use, map number and the funding used to regulate/purchase such parcels. The third step inventoried the recreation potential of the lands designated in the previous step (see Lands of Recreation Potential, Appendix H). Due to the large number of parcels which could be designated under this section, the private lands which are listed consist only of: Chapter 61 parcels; significant parcels held by Mount Holyoke College; parcels owned by groups with an interest in recreation (i.e. Canoe Club; Swimming Club; Scouts, etc); and the 264 acre Industrial Garden parcel which is primarily open agricultural land. The inventory of public land included parcels of significant size which are owned by the Town, the State, The Conservation Commission or utility companies, while the only non-profit parcels within South Hadley are owned by local land trusts (see Open Space Inventory, Appendix H).

[NOTE TO OPEN SPACE COMMITTEE: Blank areas in summary matrix should be filled in as best they can, preferably in completion]

5.1 Private Parcels

As mentioned above, the inventory of private lands includes parcels which are under Chapter 61 designation. Within South Hadley this is a primary qualifier. There are currently three parcels under Chapter 61 designation, three under Chapter 61B and sixty-seven parcels under Chapter 61A. Since Chapter 61 parcels are not protected in perpetuity, however, the only agricultural lands which are protected in perpetuity, are those which also have an Agricultural Preservation Restriction (APR), placed upon them. There are two APR parcels in South Hadley and although one is currently used as an active farm, the other parcel borders Stony Brook and could thus become an access point to the stream. Combined, these two parcels total _____ acres of protected open space.

[NOTE TO OPEN SPACE COMMITTEE: Include short paragraph describing Mount Holyoke Golf Course--who uses it (public or private); its size in acres and zoning; have there been any recent improvements]

[NOTE TO OPEN SPACE COMMITTEE: Include short paragraph describing the South Hadley Swimming Club and the Redcliffe Canoe Club--who uses these facilities; are they public or private; what are the respective acres and zoning; what activities do they provide]

[NOTE TO OPEN SPACE COMMITTEE: Include brief description of open space owned and/or managed by Mount Holyoke College. What are the uses; what facilities are available; have there been any recent improvements to recreational facilities; also, include parcels of significance which may not already be on the summary list]

Within South Hadley there are also a number of privately-owned parcels which have the potential for providing usable open space. Many, especially the parcels north of Pearl Street, are in the Ultimate Acquisition Boundary outlined by the Department of Environmental Management and can provide access to and views of the Holyoke Range. There are also significantly sized parcels which exist along the mouth of Bachelor Brook and should be considered for access and protection of this water corridor. Due to the size of the summary matrix which already accompanies this section, however, these parcels are not included in the listing.

5.2 Public and Nonprofit Parcels

The State of Massachusetts owns a large number of parcels within the Town of South Hadley, a majority of which are managed by the Department of Environmental Management. Within the Holyoke Range the DEM manages 14 parcels, one of which is Skinner State Park. This park not only contains the Summit House, an historic hotel described in Section 3 of this report, it also provides scenic views of the Connecticut Valley and links to the Metacomet-Monadnock hiking trail, as well. The park is zoned agricultural by South Hadley zoning by-laws, and is located at the far westerly end of the Holyoke Range. The park has no formal recreation areas, yet is a common attraction for tourists and hikers, not to mention the number of cyclists who challenge the climb to the Summit every year. Currently the only formal access to Skinner State Park is via Summit Road off of Route 47 in Hadley, Massachusetts.

[NOTE TO OPEN SPACE COMMITTEE: Include paragraph or two about other state-owned recreation lands; their uses; their location; their zoning; and access]

There are only two non-profit parcels within South Hadley, both of which are owned and managed by local land trusts. The Connecticut River Watershed Council parcel consists of _____ acres just north of Cove Island and slightly inland from the Connecticut River. This parcel is accessible by River Road and is fully contained in the 1% Flood Hazard Zone. The Connecticut River Watershed Council has undergone extensive management changes in the past few years, and if and when the group ever disbanded, all parcels held by them would revert to the Town in which they were located. In addition, the Kestrel Trust parcel which is located in the Holyoke Range and is _____ acres in size, is currently being considered for transference to the Department of Environmental Management. This parcel is zoned agricultural by South Hadley by-laws, yet is protected in perpetuity because of its management status.

5.2.1 Public Conservation and Recreation Resources

A large number of parcels fall under the above heading, and those which shall be discussed here are owned and/or managed by the Conservation Commission, the local Fire District, or are school parcels with recreational facilities. Fire District #2, which is the major water managing agency for the Town of South Hadley, owns an extensive number of parcels within the Holyoke Range. These parcels were primarily acquired for watershed protection and not only contain Lithia Springs Reservoir, but the hiking trails which exist within the Range, as well.

[NOTE TO OPEN SPACE COMMITTEE: include brief paragraph of Conservation Commission parcels--what parcels are they; what are their respective sizes; where are they located; what activities do they offer; what management strategies are being applied]

[NOTE TO OPEN SPACE COMMITTEE: Include brief description of School parcels--what outdoor activities are being provided; what facilities need to be added; what are their respective sizes; and what are the needs for more]

[NOTE TO OPEN SPACE COMMITTEE: Include inventory of playgrounds--should follow SECTION 504 guidelines. Brief description of access; types of equipment; safety of equipment; general improvements necessary]

5.2.2 Semi-Public Lands

The two primary utility companies within South Hadley are the Holyoke Power and Electric Company and the Holyoke Water Power Company. At the mouth of Bachelor Brook the two companies own a combined total of _____ acres on ____ parcels. This area is zoned as agricultural, which means that they are not protected from residential development if they should ever be sold. These parcels do allow for significant river frontage and access to the brook, and should thus be looked at for conservation protection and/or restriction. In addition, Holyoke Water Power Company owns the ____ acre parcel known as Cove Island. This parcel is located just north of Canal Park and is leased to the Town of South Hadley as a recreation area. Again, the parcel is not protected in perpetuity, and conservation protection and/or restriction of the parcel should be considered.

The Holyoke Power and Electric Company further owns a number of parcels to the eastern side of Alvord Street. Although these parcels contain high-tension wires, they are long and narrow in shape and thus provide an existing opportunity for a natural corridor. With respect to potential hazards from the power lines, such parcels could lend themselves to recreation trails and could potentially provide linkages from the surrounding neighborhoods to Bachelor Brook and Brunelle's Marina.

5.2.3 Other Public, Unprotected Lands

The Town owns a variety of parcels which are not protected in perpetuity, but none are more important for consideration than those currently deeded to the Conservation Society. The

Conservation Society was a local land organization which was interested in the protection of parcels which were held in high regard for conservation potential. The Society was founded in 1960, yet disbanded in _____. It was stated in the by-laws of the Conservation Society, that upon disorganization the parcels held under their ownership would be deeded over to the management/ownership of the South Hadley Conservation Commission. Since disbanding, however, no deeds have been transferred. This is an important issue if such parcels are to be considered protected in perpetuity, for they are not protected until the deeds have legally been transferred. This is further an important issue, for a majority of the Conservation Society parcels are within the Holyoke Range, are zoned agricultural, and are thus not currently protected from development.

Other lands which are not protected in perpetuity include: School parcels, the Beachgrounds recreation fields in South Hadley Falls and the parcels which are not under the management of the Conservation Commission. Although the protection of all parcels may not be appropriate, the protection of parcels deemed 'high' in recreation potential, is necessary in order to protect the open space and recreation resources of the Town of South Hadley.

Section 6 - Community Goals

6.1 Description of Process

The goals of the town of the South Hadley community as they pertain to open space and recreation planning are established from a compilation of the results of the public participation section of this document. They are also formed in conclusion to brainstorming charettes with the various town committees.

[Note to Open Space Planning Committee: It is further suggested that other means of gathering community input are employed. One option which is believed to produce a valuable source of needs data is interviewing with other special interest groups in the town. (i.e., Senior citizens groups, council on Aging and possibly school aged children)]

6.2 Statement of Open Space and Recreation Goals

The town has an uncommon combination of different cultural and natural resources which not only provide for diverse opportunities in tourism and recreation for human activity, but also provide a vast habitat for wildlife. These two elements of the town's open space and recreation resources are

addressed by the Open Space and Recreation Committee, the Recreation Committee, and the Conservation Commission. The Recreation Committee addresses the needs of the human inhabitants of South Hadley, the Conservation Commission is the group investing in the interest of natural resources and wildlife preservation and protection, while the Open Space committee creates a harmonious coalescence between the two.

The primary goal of this plan is to establish a strategy for achieving the objectives for preserving, protecting and expanding the existing cultural and natural resources which make South Hadley such a beautiful community in which to live and play.

Section 7. Analysis of Needs

7.1 Summary of Resource Protection Needs

A number of resource protection needs have been identified at this point in time. Protection and access to the Holyoke Range and Connecticut River are the prime concerns. Any type of development in the 1% flood hazard zones should be avoided in the future, and work with efforts such as the Connecticut Valley Action Program (see Appendix B) should help protect the river and other streams in town. Conservation easements, fee simple acquisition and more emphasis on the Holyoke Range GOALS Plan (see Appendix B) are needed for further protection of the range.

An apparent lack of awareness of important wetlands in town is a shortfall that needs attention. The northern floodplain forest on the Connecticut River and the mouths of Bachelor and Stony Brooks are valuable resources to South Hadley, as are the wetlands surrounding White Brook and the southeast portion of town.

An aggressive attempt protect residents in properties near the landfill is also needed. The Department of Environmental Protection has determined that this area is a priority 21E site, and every precaution should be taken to ensure public safety.

Finally, increased sensitivity to the habitat of the bald eagle and the shortnose sturgeon is needed. Any future development or point and non-point source pollution activities should undergo great scrutiny, because these are federally protected species.

7.2 Summary of Community Needs

South Hadley is a unique Connecticut Valley town by virtue of its location in the transition zone between the densely populated urban centers to the south and the more rural agricultural communities to the north. In the past both of these conditions have influenced open space and recreation planning throughout the town, are expected to do so in the future, as well. Add to this geographic blend the dominance of the two most important regional landscape features, the **Holyoke Range** and the **Connecticut River**, and the framework is established for meeting South Hadley's open space and recreation needs.

These needs are appropriately expressed by the three key open space and recreation groups in South Hadley, the Recreation Committee, the Open Space Planning Committee, and the Conservation Commission. Each has contributed its own perspective to the drafting of the "action plan" (see **Action Plan Map**, Appendix G). Each set of concerns is a bit different. The Recreation Committee points to the need for additional playing fields (soccer, baseball, softball) throughout the town, and the location of small parks within the heavily developed neighborhoods in the southern section of town. This view is underscored by demographics information which identifies 20% of the population of South Hadley as school-aged (see **Section 3.3, Population Characteristics**).

In contrast, the Open Space Planning Committee stresses the expansion of the Holyoke Range trail system for passive recreation (hiking, skiing, etc.), and increased access to the Connecticut River. The largest single owner on the South Hadley section of the Holyoke Range, the Massachusetts DEM, includes in its G.O.A.L.S. Plan recommendations for continued purchase of lands within the "ultimate acquisition boundary", as well as expanding the local trail network around the regionally significant Metacomet-Monadnock Trail which runs along the spine of the mountain (see Appendix B).

Direct access to the Connecticut River is currently difficult due to both topographic and environmental constraints along its banks. However, access onto the town's major Connecticut River tributaries, Bachelor and Stony Brooks, would allow for important connections to the river. This recommendation appears in the **Range and River** action plan (see **Section 9**, and **Action Plan Map**, Appendix G). The same demographics report referred to above reveals that 40% of the 1990 South Hadley population currently falls between the ages of 20 and 45 years of age, an increase in that age range of 5% from 1980. There is a significant potential for support of such activity from this particular segment of the town's population.

The South Hadley Conservation Commission expresses concern for protection of the riparian areas along all waterways in South Hadley, particularly the Connecticut River and Bachelor and Stony Brooks. In addition, the Commission stresses the need to transfer properties currently owned by the now defunct Conservation Society, a dissolved local land trust, to the Conservation Commission. This would insure permanent protection status for these lands. (see **Action Plan Map, Appendix G**).

[Note to the Open Space Planning Committee: results of the survey and any public forums should be discussed here to complete the Community Needs section]

7.3 Management Needs, Potential Change of Use

[Note to the Open Space Planning Committee: this section should include a discussion of specific management needs (staff, equipment, etc.?). Immediate needs and/or opportunities.]

Section 8 - Goals and Objectives

[Note to the Open Space Planning Committee: This section should be altered and expanded to reflect the results of the survey/questionnaire administered by the Open Space Committee and the outcome of other methods of receiving public opinions:]

Based on the community goals stated in Section 6, the establishment of strategies for preserving, protecting and expanding cultural and natural resources is based on increasing the overall quality of life for the town's inhabitants. The goals and objectives stated here were a consequence of the citizen survey [forthcoming], public meetings and conferences between the various town committees, commissions and counsels. It is hoped that this procedure has increased community involvement in the open space and recreation planning process and thus, the citizens of the community have become more aware of the potentials brought about by a comprehensive Outdoor Recreation and Open Space plan.

[Note to the Open Space Planning Committee: The following are suggested goals and objectives of our graduate team and will be adjusted in response to the public survey.]

Goal 1: Support and promote both resource preservation and passive recreation along the Connecticut River and its tributaries.

Objective 1a: Establish trail links to banks of Connecticut River from other points of access (i.e. roadways and other trails)

Objective 1b: Acquire land for canoe access to Bachelor and Stony Brooks.

Objective 1c: Promote community involvement with river and stream clean-up efforts.

Goal 2: Continue protection of existing water resources including wetlands, aquifers and their recharge areas, streams, ponds and floodplains.

Objective 2a: Promote education of wetlands' environmental significance.

Objective 2c: Work to acquire additional lands in the range around existing water supplies.

Objective 2d: Work with Regional, State and Federal agencies to promote continued support of Connecticut River upgrade to Class B.

Goal 3: Provide increased passive recreation and conservation activities in the Holyoke Range.

Objective 3a: Increase access to range in the central part of the range within South Hadley (Pearl Street)

Objective 3b: Increase efforts to acquire additional land in the range.

Objective 3c: Work with State agencies to promote recreation opportunities.

Goal 4: Increase active recreation potential for all areas of town.

Objective 4a: Utilize existing town lands for recreational use. (Town Farm)

Objective 4b: Acquire additional lands/easements for active recreation purposes.

Objective 4c: Promote increased active recreation opportunities for young children. (i.e., neighborhood playgrounds)

Objective 4d: Work with neighboring towns to promote regional links to various town natural and cultural attractions. (Bike path along old trolley line)

Goal 5: Increase citizen participation in preserving cultural and natural resources.

Objective 5a: Increase citizen interest in local cultural and historical significance of South Hadley.

Objective 5b: Encourage interaction among the many committees whose interests work toward a common goal. (e.g. Historical Society, Canal Park Comm.)

Objective 5c: Continue to develop educational materials on town heritage.

Goal 6: Work with current and future development trends to ensure provision of open space and recreation opportunities.

Objective 6a: Promote existing provisions within town by laws for incorporation of open space and recreation amenities within proposed subdivisions.

Objective 6b: Work harmoniously with developers to encourage open space and recreation facilities within proposed.

Objectives 6c: Continue Planning Department's and Open Space Committee's efforts to work together in developing ways of protecting choice agricultural land.

Section 9 - Five-Year Action Plan

[Note to the Open Space Planning Committee: The following Action Plan items are arranged according to priority. Each action has been designated into a priority group based on 1) degree of importance to the town and 2) ease of implementation. The Committee should put their final list of action items into a five year timetable and include them in the required Action Plan Map]

Priority 1

*Develop neighborhood parks on small town-owned parcels and "paper streets" (see Action Plan Map, Appendix H)

*Hold a volunteer workday to promote Range and River - An Open Space and Recreation Plan for the Town of South Hadley, Massachusetts

*Promote the use of the Town Farm parcel as recreation playing fields (see Action Plan Map, Appendix H)

Priority 2

*Require park set-asides in conventional subdivisions

*Acquire land for watershed protection around existing water supplies in Fire District #2 (see Action Plan Map, Appendix H)

*Construct canoe launches on the Bachelor and Stony Brooks for access to the Connecticut River (see Action Plan Map, Appendix H)

*Investigate the acquisition of Tax Title property (see unknown ownership parcels, Action Plan Map, Appendix H)

*Develop methods to protect prime agricultural lands

Priority 3

*Establish a local land trust for the purposes of open space protection

*Determine the feasibility of establishing a bikeway from Hampshire College to Mt. Holyoke College on the abandoned trolleyway (see Action Plan Map, Appendix H)

Ongoing

*Support the recommendations of the Holyoke Range State Park GOALS plan.

*Promote the Massachusetts Forest Legacy Program in South Hadley.

*Work with the Connecticut Valley Action Program to acquire land along the Connecticut River.

*Legally transfer all properties belonging to the defunct Conservation Society over to the Conservation Commission (see Action Plan Map, Appendix H)

Section 10 - Public Comments

[Note to Open Space Planning Committee: you must include letters of review by officials and regional planning agency in this section.]

Section 11 - References

List of References

Berkowitz, Steven, ed. 1974 *Holyoke Range: History, Resources, Land Use*. Hampshire College, Amherst, Mass.

Bickford, Walter E., and Ute Janik Dymon, ed. 1990. *An Atlas of Massachusetts River Systems - Environmental Designs for the Future*. Division of Fisheries, Wildlife & Environmental Law Enforcement. University of Massachusetts Press, Amherst.

Clement, John. L. and Joseph P. Perry, Jr. 1990. *Chapter 61/61A Statistical Report*. Massachusetts DEM.

DeGraaf, Richard M. & David A. Richard. *Forest Wildlife of Massachusetts*. University of Massachusetts Cooperative Extension Publication #C-182

DeGraaf, Richard M., and Deborah D. Rudis. 1987. *New England Wildlife: Habitat, Natural History, and Distribution*. United States Department of Agriculture, Forest Service, Northeastern Forest Experiment Station General Technical Report NE-108.

Dickson, D.R., and C.L. McAfee. 1988. *Forest Statistics for Massachusetts - 1972 and 1985*. USDA Forest Service, Northeastern Forest Experiment Station. Res. Bull. NE-106.

Massachusetts Department of Environmental Management. 1983. *Report of the State Forestry Committee on Minimum Forest Cutting Practices Regulations*. Massachusetts DEM, Boston, Mass.

Massachusetts Department of Environmental Management. Jan. 1985. *Draft Summary - Holyoke Range State Park GOALS Plan*. Massachusetts DEM, Boston, Mass.

University of Massachusetts Department of Landscape Architecture and Regional Planning. Dec. 1991. *South Hadley - Route 116 Corridor Study*.

Massachusetts Department of Environmental Management. September 1987. *Rediscovering the River*. Massachusetts DEM, Boston, Mass.

Greenbaum, Daniel S. and Arleen O'Donnell. Oct., 1987. ***Losing Ground: The Case for Land Conservation in Massachusetts.*** Massachusetts Audubon Society.

Welsch, David J. 1991. ***Riparian Forest Buffers.*** U.S.D.A. Forest Service. NA-PR-07-91.

Soil Survey of Hampshire County Massachusetts., USDA Soil Conservation Service. 1981

Petersen, Christina M. ***Forest Resources of Massachusetts.*** University of Massachusetts Cooperative Extension, Amherst, Mass.

Massachusetts Natural Heritage and Endangered Species Program. 1992. ***Atlas of Estimated Habitats of State-listed Rare Wetlands Wildlife*** Massachusetts Division of Fisheries, Wildlife and Environmental Police, Boston, Mass.

MacConnell, William P., et al. June, 1991. ***Forest Productivity Mapping in Massachusetts.*** Massachusetts Agricultural Experiment Station. Res. Bull. #735.

Smith, Kathryn J. 1988. ***For Our Common Good: Open Space and Outdoor Recreation in Massachusetts,*** Volumes I and II. Massachusetts Department of Environmental Management, Boston, Mass.

Jillson, Jennifer; Gail Swett, and Susan Ziegler. 1991. ***Open Space Planner's Workbook.*** Massachusetts Executive Office of Environmental Affairs, Boston, Mass.

Massachusetts Department of Environmental Management. 1981. ***Massachusetts Landscape Inventory.*** Massachusetts DEM, Boston, Mass.

Goodwin, Helen L., et al, ***200th Anniversary Celebration;*** Town of South Hadley, Massachusetts, 1753-1953.

Department of Landscape Architecture and Regional Planning. Spring, 1992. ***Alvord Street Corridor Study,*** prepared for the Town of South Hadley Open Space Committee, University of Massachusetts.

December, 1988. ***South Hadley Open Space Plan Report.*** Prepared for the Town of South Hadley by the town Open Space Committee.

September, 1992. *City of Chicopee Open Space Plan*, Prepared by the City of Chicopee Planning Department.

Fabos, Julius Gy; Gross, Meir; Kim, Eun Hyung. Summer, 1991. METLAND Research bulletin Number 734 *River Corridors: Present Opportunities for Computer-Aided Landscape Planning*, Massachusetts Agricultural Experiment Station, College of Food and Natural Resources University of Massachusetts.

Zoning By-Laws; Town of South Hadley,, Massachusetts. 1992. Adopted: March 16, 1946; Amended Through March 31, 1992. Prepared by the South Hadley Planning Board.

Department of Environmental Protection Western Region File Review. November 2, 1992.

B. Further Reading

Arendt, Randall. 1988. *Open Space Zoning: An Effective Way to Retain Rural Character*. Center for Rural Massachusetts Monograph Series. University of Massachusetts, Amherst, Mass.

Center for Rural Massachusetts. *Dealing with Change in the Connecticut River Valley: A Design Manual for Conservation and Development*. University of Massachusetts, Amherst, Mass.

Eddy, Samuel and James C. Underhill. 1978. *How to Know the Freshwater Fishes*. Wm. C. Brown Company Publishers, Dubuque, Iowa.

Eyre, E.H., ed. 1980. *Forest Cover Types of the United States and Canada*. Society of American Foresters, Washington, D.C.

Fowler, Ann, Paula Levin, and Markus Pinney. 1985. *Community Guide to Open Space and Recreation Planning*. Prepared for the Massachusetts Department of Environmental Management, Division of Conservation Services, Boston, Mass. (Available from the Massachusetts Association of Conservation Commissions, 10 Juniper Road, Belmont, Mass. 02178)

Land Trust Alliance. 1990. *Starting a Land Trust*. (Available from the Land Trust Alliance, 900 17th St. NW Suite 410, Washington, DC 20006)

Lemire, Robert A. 1979. *Creative Land Development: Bridge to the Future*. Houghton-Mifflin, Boston, Mass.

Massachusetts Division of Conservation Services. 1992. *The Massachusetts Conservation Restriction Handbook*. Massachusetts Executive Office of Environmental Affairs, Boston, Mass.

Petersen, Christina M., et al. 1992. *The Forest Use Manual - Planning, Protection and Management in Massachusetts*. University of Massachusetts Cooperative Extension, Amherst, Mass.

Ross, Keith and Scott Wallace. 1990. *Conservation and Land Use Planning with Massachusetts Chapter 61 Laws*. Mt. Grace Land Conservation Trust, Inc.

Small, Stephen J. 1988. *Preserving Family Lands - A Landowner's Introduction to Tax Issues and Other Considerations*. Massachusetts Audubon Society.

Ward, Wesley T. 1987. *Land Conservation Methods and Their Tax Advantages - A Guide for Massachusetts Landowners*. Essex County Greenbelt Association and The Trustees of Reservations.

Ward, Wesley T. 1987. *Land Conservation Methods and Their Tax Advantages - A Guide for Massachusetts Landowners*. Essex County Greenbelt Association and The Trustees of Reservations.

Appendix A.

Land Protection Methods

I. Acquisition:

Property rights are often compared to "sticks in a bundle" of rights guaranteed by this country's Constitution. The number of sticks transferred at any given point in time will define the level of protection for a particular parcel. Fee simple acquisition is considered to provide the strongest measure of protection. The public conservation body or a non-profit conservation organization purchases the *total* collection of ownership rights, in other words the complete ownership, or *fee simple interest* in the land. Most often, it will be necessary for the conservation body to pay the entire value of the property. In some cases, however, the owner will agree to a *bargain sale* of the fee simple interest for a reduced sale price. In this scenario, the advantage to the seller includes the possible federal income tax deduction of the difference between full and fair market appraised value and the amount actually received for the land. Since certain specified rules apply as to documentation of appraised value and limitations on annual deduction amounts, it is recommended that interested owners seek legal and/or financial planning advice before choosing the bargain sale alternative. There is an important aside to any discussion about transfer of the entire fee of property. Since both the government and the conservation organization are currently exempt from real estate tax liability, acquisition in fee may be less of an advantage to the local community than some other methods of protection.

As an alternative to outright purchase, the open space agency may, instead, choose to acquire only a few of the sticks in the bundle, a *partial interest*, most typically the development rights, of a given property. The most common forms of a partial interest are easements and deed restrictions. Examples of partial interests are the conservation restriction, the historic restriction and the agricultural preservation restriction. The *conservation restriction*, also known as a "conservation easement" or "purchase of development rights", is a prohibition of certain uses of land placed against the deed of a property. Beginning in 1969, the Massachusetts conservation restriction attained special status under the authorization of MGL Chapters 31-33, whereby the value of the restriction will now qualify for federal tax benefits upon formal local and state approval.

Taking the tax deduction aspect of land transfer a step further, an owner may choose to donate the entire fee simple interest of property as a *charitable gift* of land to a public or qualified non-profit conservation group. Typically, most conservation organizations will now require that a sum of money termed an "endowment", accompany land donation for the purpose of covering maintenance costs associated with land ownership. This cost item, however, can certainly be negotiated.

Zoning:

Zoning, by its very nature, is restrictive. It has the force of case law and precedent, beginning with the landmark 1926 case, *Village of Euclid, Ohio v. Ambler Realty Co.* In this US Supreme Court decision, the validity of a suburban Cleveland zoning ordinance was upheld over claims by a local real estate company that the zoning would require compensation. Through the years since, zoning is merely required to meet the public interest test to be legal. Land use, floodplain, wetlands and aquifer zoning are but some of a group of development prohibitions which meet resource protection and public safety needs.

The so-called "creative development" techniques such as open space community development, also known as cluster development, and Planned Unit Development, are zoning *options* that the community makes available to the landowner. Appendix G is another example of a "creative development" technique that involves farmland and open space conservation and development bylaw.

In 1973, the state of Oregon passed legislation to protect valuable forestland as part of a larger statewide planning effort. This planning strategy requires the establishment of an *urban growth boundary* for each community, development beyond which the community determines to be either too costly in terms of infrastructure improvements, or degradation of valuable natural resources, primarily forestland.

Interim Methods:

The General Laws offers Massachusetts landowners three incentive programs designed as *temporary* protection for open space and recreation land. These are Chapter 61 (Classification and Taxation of Forest Lands and Forest Products), Chapter 61A (Assessment of Agricultural and Horticultural Land), and Chapter 61B (Recreation Land). Chapter 61, the so-called "Forest Tax Law", is a program by which owners of qualified forestland are allowed a 95% reduction of the full and fair market value of their land, in exchange for implementation of a state-approved 10-year forest management plan. Chapter 61A offers the same degree of protection for agricultural and horticultural uses requiring a yearly application based on farming yields. Chapter 61B is designed to reduce local property tax assessment on lands devoted to various recreation uses. Each "chapter" program offers the local community a right of first refusal on any bona fide offer to sell land which is being removed from these uses. This aspect potential tool in planning for town open space needs. For additional information refer to **Section 11 - References.**

Appendix B.

Land Protection Programs

The Holyoke Range GOALS Plan

The Department of Environmental Management Holyoke Range State Park GOALS Plan was formally adopted by the DEM Board in 1987. GOALS was established as a means of (1) supplementing DEM's "Long Range Capital Outlay Plan" for specific land acquisition and facilities development, (2) establishing management objectives recommendations. Some of the major recommendations currently in effect for the Holyoke Range with implications for South Hadley are listed below, as follows:

- to develop a trail system utilizing the existing trail from Route 47 north along Dry Brook to Taylor Notch, and at that point constructing a trail south, across Dry Brook, to "hill 721".
- to develop a bikeway along the abandoned trolley right-of-way located east of the Notch Visitors Center to run approximately parallel with Route 116, linking the existing Hampshire College-to-UMass bikeway with the Mount Holyoke College Campus.
- to continue the policy of purchasing lands along the Holyoke Range within the ultimate acquisition boundary. Parcels located outside the prescribed area will be reviewed for purchase by the HRCAC on a willing seller basis. The purpose of such acquisitions will continue to be protection of scenic views of the range.

More information regarding the Holyoke Range Goals Plan can be obtained from Jack Lash, Director of G.O.A.L.S. Program, Massachusetts Department of Environmental Management, Division of Resource Conservation - 100 Cambridge Street, Boston, MA 02202 (617-727-3160, extension 572).

The Massachusetts Forest Legacy Program

In 1990, the US Congress created a "Forest Legacy" program as part of that year's Farm Bill legislation. The program was initiated as a response to the threat of continuing conversion and fragmentation of forestland in urbanized states such as Massachusetts.

The purpose of Forest Legacy is protection of forestland which has been identified as being important to the maintenance of traditional forest uses such as products harvesting and recreation. The intention is for acquisition of permanent conservation easements from willing forestland owners, by the USDA Forest Service, *through the work of various local land conservation trusts*. In the Fall of 1991, a state committee was formed to review Forest Legacy Area nominations and draft a *Massachusetts Forest Legacy Needs Assessment* which is required for matching-fund eligibility. On September 30, 1992, the *Assessment* was submitted for approval to the Forest Service. Included in this document are a total of 16 Forest Legacy Area nominations reviewed by the state committee, one of which comprises a block of forestland linking the Holyoke Range with the Connecticut River (see Figure 6, Connecticut Valley Forest Legacy Area).

Additional information on the Massachusetts Forest Legacy Program can be obtained through contact with Thomas Quink, Program Manager, Southern New England Forest Legacy Program - The Environmental Institute, Blaisdell House, University of Massachusetts, Amherst, MA 01003 (413-545-5525).

The Agricultural Preservation Restriction Program

Essentially a special type of conservation restriction, the APR is a legal prohibition on the non-agricultural conversion or development of a parcel for the purpose of *permanently preserving the land for agricultural use*. The original legislative authorization for this program was passed in 1977 as MGL Chapter 780. Funding is authorized by the legislature to be used by the Massachusetts Department of Food and Agriculture for the purchase of these restrictions from willing farmers. Restrictions can also be donated by owners of certain productive farmland to the DF&A or non-profit land conservation's trusts. APR donations are subject to approval at both the local and state levels.

Additional information on the Agricultural Preservation Restriction Program can be obtained through contact with Richard Hubbard, Director, APR Program - 142 Old Commons Road, Lancaster, MA 01523 (508-792-7712).

The Connecticut Valley Action Program

Established by the Massachusetts Legislature in 1984 with \$2 million in seed money, this DEM initiative is charged with the mission of **designing a coordinated plan to ensure appropriate**

use and management of the Connecticut River, one of New England's most distinctive landscapes, and its related lands.

To realize this mission, a 33 member coordinating committee comprised of 19 riverside communities and non-profit agencies, was assembled during the first two years of the program's existence.

The planning approach designed to meet the goals of the program included dividing the Massachusetts portion of the Connecticut River into four segments or "reaches", each with a particular set of issues identified through the public participation process. For example, meeting the needs of Reach 3 communities, the primarily agricultural Hampshire County stretch of the river, will require different tools than those of the urban Reach 4, south of the Holyoke Dam. Land protection may be the predominant concern of the former, while the latter may require river clean-up funding for larger-scale recreation demands. The Action Program also provides technical assistance to local riverside communities on regional issues such as wetland and watershed protection, riverside zoning and development, and open space planning. The Connecticut Valley Action Program continues to receive funding for acquisition of land and conservation restrictions along the Connecticut River for the purposes of protection of this valuable New England resource.

Additional information on the Connecticut Valley Action Program can be obtained through contact with Terry Blunt, Program Manager - 136 Damon Road, Northampton, MA 01060 (413-586-8706).

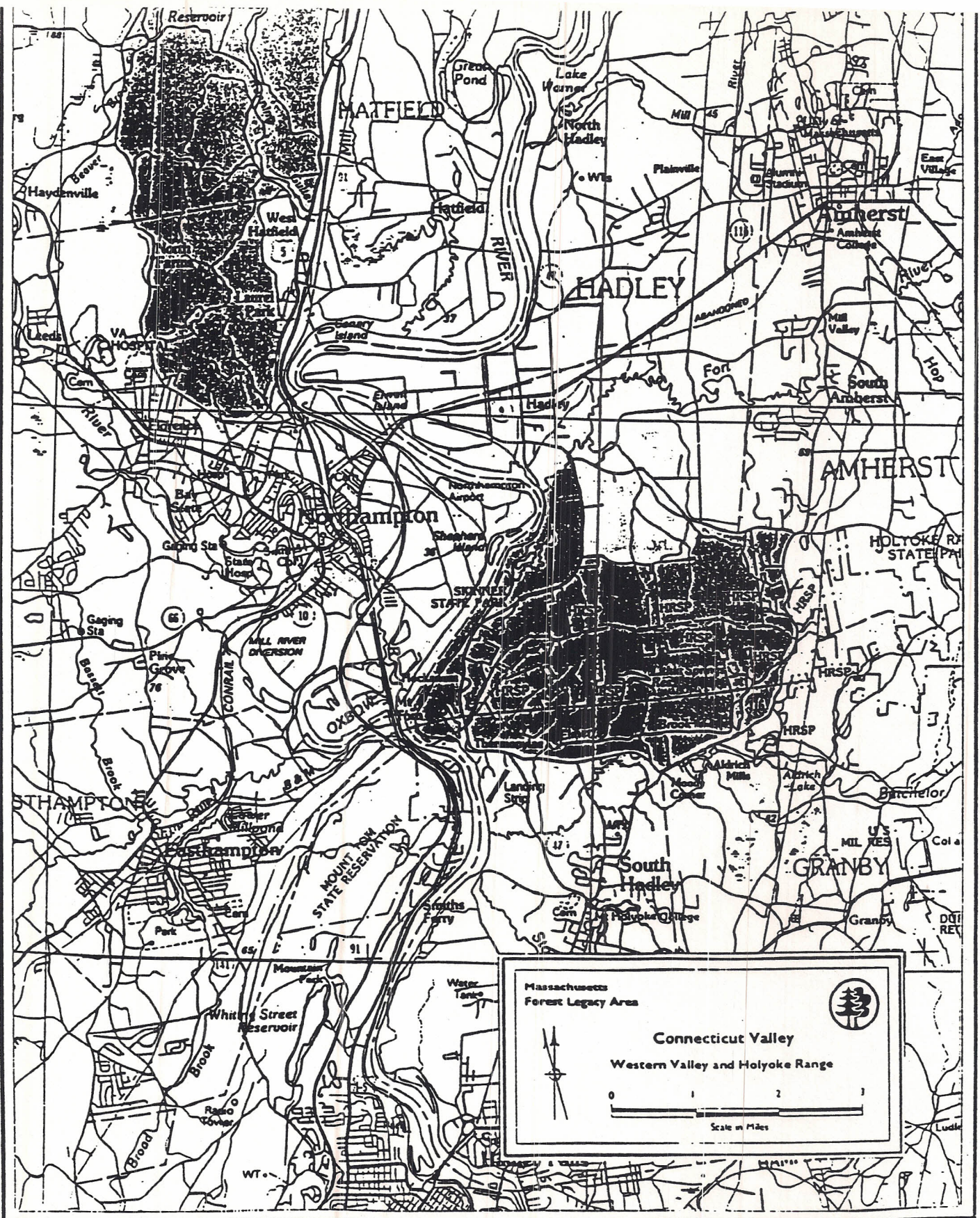


Figure 6. The Connecticut Valley Forest Legacy Area

Appendix C.

The American Farmland Trust Cost of Community Services Study

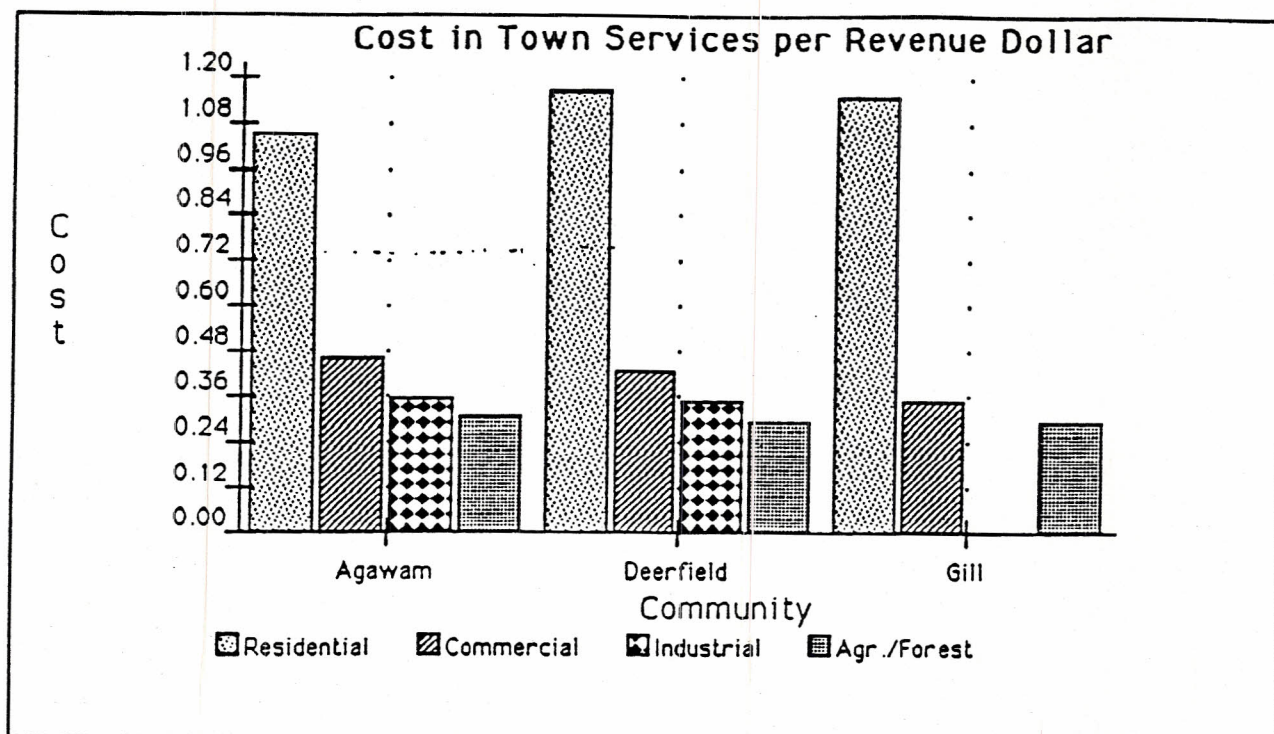
You find the local real estate tax bill in today's batch of mail. You scan the numbers and go into immediate shock at the inordinately high property assessment. And, just for a moment you entertain a frightening thought: can the local assessors actually be pressuring landowners into converting their open space land to other uses, particularly housing, through high real estate taxes? If you feel that way, you are not alone! Much of what passes for equitable property valuation theory these days is a belief that residential development will always *increase* the tax base of a community by bringing in more tax dollars. According to Northeastern Office of **The American Farmland Trust**, in Northampton, Massachusetts, however, this logic just does not stand up to the actual numbers.

The AFT has developed a fiscal evaluation model called the *Cost of Community Services Study*, a method designed to provide a "snapshot", or one year's account of the actual cost to local taxpayers of various land uses. The procedure begins with an analysis, for a given community, of both **revenues**, which typically include taxes, unallocated local receipts, any state aid, and free cash, and **expenditures**, costs for services such as fire, police and education. The benefits and costs are then allocated to four land use categories: **residential, commercial, industrial, and farm/open land**. Finally, a ratio is established for each land use which defines the actual cost in services for each dollar of revenue generated by that use.

To date, the AFT has published COCS studies for communities in Connecticut, New York and Massachusetts. Results of reports published for case studies in Gill, Agawam and Deerfield, Massachusetts consistently prove that farm/open space is a relative "bargain" use. The median ratio of dollars generated by residential development to services required to carry this use calculated out to \$1:\$1.12 for the three Massachusetts communities.

In comparison, however, open space, farmland and forestland proved to cost these towns an average of only \$.29 for every revenue dollar collected. These studies clearly show that *open space does pay!* (see Figure 7 "Cost in Town Services per Revenue Dollar")

Information on the work of the American Farmland Trust can be obtained by writing AFT - Herrick Mill, One Short Street, Northampton, MA 01060, or calling (413)586-9330.



The above graphics illustrate the results of three 1991 reports prepared by the American Farmland Trust, Northeastern Office, Northampton, Massachusetts for the Massachusetts Department of Agriculture. The bar values describe the dollar cost in services for every tax revenue dollar received by the Massachusetts communities of Agawam, Deerfield and Gill. The individual use values are as follows:

Town	Industrial	Commercial	Residential	Open space
Agawam	\$.35	\$.45	\$ 1.05	\$.30
Deerfield	\$.34	\$.42	\$ 1.16	\$.29
Gill		\$.34*	\$ 1.15	\$.29

*combines both industrial and commercial uses

Appendix D.

Sample Survey

[Note to the Open Space Planning Committee: The following sample survey was derived from the one offered in The Open Space Planner's Workbook. It has been altered and hopefully improved based on comments provided by Dr. David Loomis, an expert on research methods at the University of Massachusetts at Amherst. It may still need further review for validity, although South Hadley would be better served by the format of this example rather than the one from the Workbook.]

The South Hadley Open Space Planning Study

This survey is being conducted in order to understand the needs and concerns of the citizens of South Hadley. Furthermore, this type of input is necessary to qualify for state reimbursement programs for acquisition and protection of important town resources.

"Open space" in this survey is defined as . . . "public and privately-owned undeveloped lands which are important for a variety of reasons." These lands can be used for recreation, agriculture, forestry or simply available because of their scenic qualities and their contribution to the overall character of the town. Faced with significant growth now and in the future, open space planning will help us to preserve open space while allowing development to occur that maintains the character of the town.

Please answer all of the applicable questions. If you wish to comment on any questions or qualify your answers, please feel free to bring it to our attention or use the space on the back of this survey. Thank you for your help.

First, we would like to ask a few questions about the character of South Hadley.

1. Do you consider South Hadley:
(Please circle an answer for each)

A) A RURAL TOWN.....	YES	NO
B) A SUBURB OF AMHERST.....	YES	NO
C) A SUBURB OF NORTHAMPTON.....	YES	NO
D) A SUBURB OF SPRINGFIELD.....	YES	NO
E) A BEDROOM COMMUNITY.....	YES	NO

2. To preserve open space within the town, would you:
(Please circle an answer for each)

A) CONTRIBUTE LAND TO THE TOWN.....	YES	NO
B) DONATE MONEY FOR LAND ACQUISITION.....	YES	NO
C) REWRITE YOUR DEED TO LIMIT FUTURE USE OF YOUR LAND.....	YES	NO
D) SELL LAND TO THE TOWN AT A "BARGAIN PRICE".....	YES	NO
E) PERMIT A CONSERVATION RESTRICTION TO OCCUR ON YOUR LAND.....	YES	NO
F) SELL LAND TO THE TOWN AT FAIR MARKET VALUE.....	YES	NO
G) VOTE FOR A TOWN-SUPPORTED LAND ACQUISITION...	YES	NO
H) OTHER (Please specify)_____		

3. How important is it to you to preserve the following:
(Please circle the number which corresponds to your choice)

	Very Important	Important	Neutral	Less Important	Not Important
A) BUILDINGS OF HISTORIC INTEREST.....	1	2	3	4	5
B) BUILDINGS OF ARCHITECTURAL INTEREST.....	1	2	3	4	5
C) PLACES OF HISTORIC VALUE.....	1	2	3	4	5
D) FARMLAND.....	1	2	3	4	5
E) OPEN SPACE FOR CONSERVATION.....	1	2	3	4	5
F) OPEN SPACE FOR RECREATION.....	1	2	3	4	5

4. Of the following, which residential growth policies do you favor for the town?
(Please circle one answer for each)

A) NO GROWTH.....	YES	NO
B) GROWTH EVENLY SPREAD.....	YES	NO
C) REGULATE GROWTH IN DEVELOPED AREAS.....	YES	NO
D) REGULATE GROWTH IN UNDEVELOPED AREAS.....	YES	NO

5. What business growth policies do you favor for the town?
(Please circle one answer for each)

A) NO GROWTH.....	YES	NO
B) GROWTH EVENLY SPREAD.....	YES	NO
C) REGULATE GROWTH IN DEVELOPED AREAS.....	YES	NO
D) REGULATE GROWTH IN UNDEVELOPED AREAS.....	YES	NO

6. What industrial growth policies do you favor for the town?
(Please circle one answer for each)

A) NO GROWTH.....	YES	NO
B) GROWTH EVENLY SPREAD.....	YES	NO
C) REGULATE GROWTH IN DEVELOPED AREAS.....	YES	NO
D) REGULATE GROWTH IN UNDEVELOPED AREAS.....	YES	NO

7. What kind of businesses would you like to see in South Hadley?

- | | | |
|-----------------------------------|-----|----|
| A) AGRICULTURAL..... | YES | NO |
| B) GROCERY/FOOD..... | YES | NO |
| C) HOME BUSINESS..... | YES | NO |
| D) LIGHT INDUSTRY..... | YES | NO |
| E) PROFESSIONAL SERVICES..... | YES | NO |
| | | |
| F) RECREATION/SPORTING GOODS..... | YES | NO |
| G) RETAIL | YES | NO |
| H) HEAVY INDUSTRY..... | YES | NO |
| I) OTHER (Please specify)_____ | | |

8. Which of the following are you in favor of?

- | | | |
|---|-----|----|
| A) ACQUISITIONS OF CONSERVATION AREAS
BY THE TOWN..... | YES | NO |
| B) EXTENDING TOWN SEWER SERVICES TO
PROMOTE DEVELOPMENT..... | YES | NO |
| C) INCREASING COMMERCIAL BUSINESS
DEVELOPMENT..... | YES | NO |
| D) INCREASING INDUSTRIAL DEVELOPMENT..... | YES | NO |
| E) REGULATING HOUSING DEVELOPMENT..... | YES | NO |

Next, we would like you to answer some questions about farmland preservation.

9. Do you favor the preservation of farmland? (Please circle only one answer)

- A) YES
B) NO
C) NO OPINION

10. What town actions do you support for the preservation of farmland?

- | | | |
|---|-----|----|
| A) COMBINATION OF PUBLIC & PRIVATE ACTION..... | YES | NO |
| B) RECEIPT OF CONSERVATION RESTRICTIONS..... | YES | NO |
| C) TOWN PURCHASES OF LAND..... | YES | NO |
| D) ZONING FOR OPEN SPACE CONSERVATION..... | YES | NO |
| E) MANDATORY DEDICATION OF FARMLAND
BY DEVELOPERS..... | YES | NO |

11. What private actions do you support for the preservation of farmland?
(Please circle one answer for each)

- | | | |
|--|-----|----|
| A) PURCHASE OF SCENIC LAND..... | YES | NO |
| B) LIMITED DEVELOPMENT..... | YES | NO |
| C) DONATION AND RECEIPT OF CONSERVATION
RESTRICTIONS..... | YES | NO |

12. What state actions do you support for the preservation of farmland?
(Please circle one answer for each)

- | | | |
|--|-----|----|
| A) OUTRIGHT PURCHASE OF LAND..... | YES | NO |
| B) PURCHASING OF DEVELOPMENT RIGHTS..... | YES | NO |
| C) PROPERTY TAX REDUCTION PROGRAMS FOR
FARM LAND..... | YES | NO |
| D) PROPERTY TAX REDUCTION PROGRAMS FOR
FOREST LAND..... | YES | NO |
| E) PROPERTY TAX REDUCTION PROGRAMS FOR
RECREATION LAND..... | YES | NO |

Please answer the following questions about the recreation needs of South Hadley.

13. How satisfied are you with the places in town for recreation use by:
(Please circle the number which best corresponds with your answer)

- | | Very Satisfied | Satisfied | Neutral | Dissatisfied | Very Dissatisfied |
|----------------------------|----------------|-----------|---------|--------------|-------------------|
| A) children and youth..... | 1 | 2 | 3 | 4 | 5 |
| B) adults..... | 1 | 2 | 3 | 4 | 5 |
| C) the elderly..... | 1 | 2 | 3 | 4 | 5 |

- | | | |
|---|-----|----|
| 14. Should the town be concerned with maintaining current recreational facilities? | YES | NO |
| 15. Should the town be concerned with the acquisition of additional conservation lands? | YES | NO |
| 16. Should there be equal emphasis on recreational facilities and conservation land? | YES | NO |

17. Please list in order of importance from 1 to 5 (1 being the most important, 5 being least important) the top five recreational facilities you feel are needed in South Hadley.

☐ BIKE TRAILS
☐ CONSERVATION AREAS
☐ CHILDREN'S PLAY AREAS
☐ FIELDS FOR SOCCER
☐ CROSS-COUNTRY SKI TRAILS
☐ FIELDS FOR FOOTBALL
☐ FIELDS FOR SOFTBALL
☐ TENNIS COURTS
☐ HIKING TRAILS
☐ RECREATION CENTER BUILDING
☐ PUBLIC ACCESS AREAS TO WATER
 BODIES FOR BOATING

☐ LOCAL NEIGHBORHOOD PARKS
☐ OUTDOOR AMPHITHEATER
☐ FAMILY PICNIC AREAS
☐ SWIMMING POOL
☐ FIELDS FOR BASEBALL
☐ GOLF COURSE
☐ TOWN COMMON IMPROVEMENT
☐ LARGE PARK WITH MANY FACILITIES
☐ ICE SKATING RINK
☐ OTHER(Please specify)_____

18. How important are the following to you:

		<i>Very Important</i>	<i>Important</i>	<i>Neutral</i>	<i>Less Important</i>	<i>Not Important</i>
A) The acquisition of conservation areas as natural areas.....	1	2	3	4	5	
B) Preservation of conservation areas as natural areas.....	1	2	3	4	5	

29. What do you like best about living in South Hadley?

20. What do you like least about living in South Hadley?

In order to help us interpret our results, please answer these final questions.

21. How long have you been a resident of South Hadley?

☐ LESS THAN 5 YEARS
☐ 5-9 YEARS
☐ 10-20 YEARS
☐ MORE THAN 20 YEARS

22. Do you or anyone in your household own property in town?

- | | | |
|-------------------------------|-----|----|
| A) YOURSELF..... | YES | NO |
| B) YOUR PARENT(S)..... | YES | NO |
| C) YOUR CHILDREN..... | YES | NO |
| D) YOUR HOUSEMATE..... | YES | NO |
| E) OTHER (if applicable)..... | YES | NO |

23. Which of the following best describes your current living situation?

- ☐ SINGLE - LIVING ALONE
- ☐ SINGLE - SHARING LIVING QUARTERS
- ☐ MARRIED - NO CHILDREN OR NONE AT HOME
- ☐ MARRIED - CHILDREN LIVING AT HOME
- ☐ SENIOR CITIZEN - LIVING ALONE
- ☐ SENIOR COUPLE OR FAMILY
- ☐ OTHER (Please specify) _____

Is there anything else you would like to tell us about open space planning in South Hadley, or about town government in general, as we plan for the future? If so, please use the bottom or back of this sheet for that purpose. Thank you very much for your effort. Results will be made available at Town Hall and highlights will be shared with local papers.

Appendix E.

Farmland Open Space Protection

Farmland and Open Space Protection

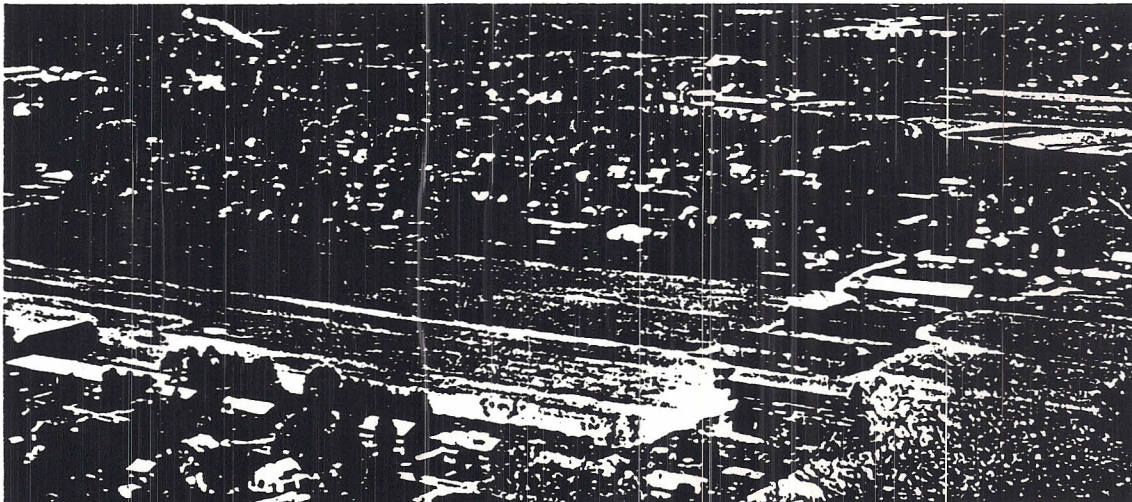
The Problem

One of the most vexing problems facing small towns today is the rate at which farmland is being developed for residential use. Such conversions devastate rural character, and further compromise an already beleaguered industry. The meadows in which children once played or cows once grazed are being carved into house-lots throughout the length of the Valley. Long-term residents see their towns changing at an alarming pace and feel helpless to break the pattern of conventional suburban sprawl (often inadvertently encouraged by "protective" bylaws containing development standards inappropriate to rural areas).

One of the most common reactions to new development is to increase the minimum residential lot size, in the mistaken belief that, as new homes are spread farther apart, the town's open rural character will be retained. Although this is a laudable goal, this method often produces the opposite result, with remaining open land being subdivided at an even faster rate. To worsen the situation, such developments nearly always consume the entire parcel being sold, leaving no residual open space for farming, natural enjoyment, or rural beauty.

The traditional character of Massachusetts towns has evolved gradually over several centuries, during which time farmsteads and village centers grew slowly and organically, without the straitjacket of standardized land-use regulations. Rural towns often contain several villages where development is moderately dense, with the remainder of the land dotted by farms. If the goal is to maintain town character, then a method must be found to preserve agricultural land and open space surrounding natural groupings of residential development.

Two approaches to farmland preservation in Massachusetts which have enjoyed some success over the past decade are: 1) the state's Agricultural Preservation Restriction (APR) program (through which development rights to agricultural land are bought and held by the Commonwealth, with future land use limited to agriculture); and 2) various land trusts, which function in a broadly similar manner, utilizing private funds and land donations. However, both of these programs are seriously limited by shortage of cash and escalating land prices all across the state. For example, the Commonwealth's investment of \$45 million over the last ten years has protected 18,500 acres of farmland, which accounts for only 3% of this non-renewable resource. Most of the remaining 97% lies unprotected and zoned for conventional development.



Farmland parcels adjacent to moderately sized lots in Hadley's historic town center illustrate the land-use pattern achievable by implementing the development-and-conservation standards contained in this section.

What is urgently needed is a practical, low-cost approach to land conservation which simultaneously preserves farmland and significant open space, while also allowing landowners full equity value for residential subdivision of their land. This is precisely what the following "Farmland/Open Space Conservation and Development Bylaw" has been designed to achieve. Because it allows for the same number of lots under conventional subdivision, sellers receive full value for their land. It also requires the setting aside of half the acreage for agricultural or open space uses, in perpetuity, thus meeting the second goal as well. In addition, road and utility construction is generally reduced significantly, thereby saving on development costs and public expenditures for snowplowing and periodic repaving.

Districts for Implementation

Two types of districts may be defined by towns for the implementation of this type of bylaw. The first are areas in which farming is predominant. These may be identified by overlay maps locating the soils which are most suitable for agriculture, land which is currently being farmed, and land already under the Agriculture Preservation Restriction program. The opinions of farmers regarding which areas are most important to safeguard should be solicited and considered carefully.

A second possible type of district is an open space protection district. This type of area, if not intensively farmed, would have other scenic or natural resources worth protecting. Criteria for defining this type of zone include: large tracts of undeveloped land; aquifer recharge areas; sites identified under the Massachusetts Natural Heritage program (administered by the Massachusetts Department of Fisheries and Wildlife); areas of scenic beauty within the town (perhaps as identified in the Massachusetts Landscape Inventory, prepared by the Massachusetts Department of Environmental Management in 1982); and areas of historical or cultural interest. These criteria, either singly or as a group, are important considerations in land preservation.

These districts should be mapped, with a written explanation of why the boundaries were drawn and why neighboring lands were either included or excluded. This would strengthen the case for implementing the bylaw, and would make it easier to defend, if the zoning boundaries are legally challenged.

Farmland/Open Space Conservation and Development Bylaw

1. Purposes

The purposes of this bylaw are to maintain the rural, natural, and scenic qualities of the Town of _____, Massachusetts by preserving farmland and significant open lands while allowing landowners a reasonable return on their holdings. Toward this end, the creation of three (3) or more lots for residential use, whether or not constituting a subdivision, or construction of three (3) or more dwelling units within a five-year period from or on a property or set of contiguous properties in common ownership as of _____, within or partially within the Farmland/Open Space Protection District, shall be allowed only on Special Permit by the Planning Board, in accordance with the criteria set forth below.

2. Establishment of Overlay Districts

The Farmland/Open Space Protection Districts are herein established as overlay districts. The Farmland/Open Space Protection Districts are described on a map, entitled "Farmland/Open Space Protection Districts, Town of _____", a copy of which is on file with the Town Clerk. The Farmland/Open Space Protection Districts include farmland of state or local significance, said determination based upon a combination of factors, including soil type, historic use of the land in question, size of the parcels used for farming or agricultural purposes, and character of the surrounding area. Significant Open Space of more than _____ acres is also included in the District.

3. Use Regulations

Within the Farmland/Open Space Protection District, the requirements of the underlying districts shall apply, unless the following provisions are deemed more stringent than the underlying requirements:

3.1 Permitted Uses

3.1.1 Agriculture, horticulture, or floriculture, and any accessory uses or structures appurtenant thereto, including farm-based businesses.

3.1.2 Creation of one or two (1 or 2) lots for residential use, whether a subdivision or not, or construction of one or two (1 or 2) dwelling units within a five-year period from or on a property or set of contiguous properties in common ownership as of _____. Each lot for residential use shall contain at least _____ sq. ft.

3.1.3 Timber-cutting for public safety, personal non-commercial use, or performed according to a forest management plan drafted under Chapter 61, or commercial selective cutting of not more than five (5) acres of land within a five (5) year period, is permitted within Open Land Preservation Districts.

3.2 Special Permit Uses

Creation of three (3) or more lots for residential use, whether a subdivision or not, or construction of three (3) or more dwelling units, within a five (5) year period from or on a property or set of contiguous properties in common ownership as of _____.

3.3 Prohibited Uses

All other uses are hereby prohibited.

4. Special Permit for Residential Development in Farmland/Open Space Protection Districts

The creation of three (3) or more lots for residential use, whether a subdivision or not, or construction of three (3) or more dwelling units, within a five-year period from or on a property or set of contiguous properties in common ownership as of _____, shall be allowed only on Special Permit by the Planning Board. Such Special Permits shall be acted upon in accordance with the following criteria.

4.1 Data Requirements

Applicants for Special Permit shall file with the Town Clerk one (1) copy, and with the Planning Board five (5) copies, of the following documents:

4.1.1 A Development Plan conforming to the requirements for a preliminary subdivision plan under the Planning Board's Subdivision Rules and Regulations. Such Development Plans shall also indicate, unless the development is to be sewerred, the results of deep soil test pits and percolation tests, at the rate of no fewer than two (2) successful test results for each proposed septic disposal area.

4.1.2 An Environmental Analysis, if required under the Planning Board's Subdivision Rules and Regulations.

4.1.3 A site plan, as required under Section ___, Site Plan Review.

4.2 Criteria

Applications for Special Permits for residential construction in Farmland/Open Space Protection Districts shall meet all of the following criteria:

4.2.1 The Development Plan shall demonstrate that, where applicable, the proposed development meets all of the requirements of the Planning Board's Subdivision Rules and Regulations.

4.2.2 The minimum area of land for Special Permit development shall be six (6) acres. The total number of dwelling units shall be determined at the rate of one (1) unit per every two (2) acres of buildable land, after excluding from this computation all wetlands, as defined by M.G.L.A. CH. 131, S. 40, and flood-prone land, as defined by the Zoning Bylaw.

4.2.3 The total area of residual farmland or open space within the development shall be at least fifty (50) percent of the total area of buildable land in the proposed development, excluding from this computation all wetlands, as defined under M.G.L.A. CH. 131, S. 40.

4.2.4 All residual land which is to be used only for recreational, conservation, or agricultural purposes, shall be:

- a. owned jointly or in common by the owners of the building lots, or
- b. owned by the Town, subject to acceptance.

A third alternative is for the deed to this residual open land (with permanent conservation restrictions) to remain with the original property owner, who has sold the development rights to this part of the parcel to the developer (who in turn has sold an undivided equal interest in these rights to each new homeowner in the development).

4.2.5 The residual open land left unbuilt after development shall be mowed or plowed at least once annually. Special Permit applicants shall provide copies of deed covenants with prospective purchasers, or conservation easements with the Town, describing land management practices to be followed by whichever party or parties are responsible for annual mowing or plowing.

4.2.6 Further subdivision of residual land, or its use for other than non-commercial recreation, conservation, or agriculture (except for easements for underground utilities), shall be prohibited. Structures and buildings accessory to non-commercial recreation, conservation, or agriculture may be erected on residual land, subject to the Site Plan Review section of this Zoning Bylaw. These restrictions shall be recorded in a Conservation Easement to which the Town Conservation Commission is a signatory party.

4.2.7 Where applicable, a homeowners' association shall be established for the purpose of permanently maintaining all residual open space and recreational facilities. Such homeowners' association agreements, guaranteeing continuing maintenance, and giving lien to the Town in the event of lack of such maintenance, shall be submitted to the Town Counsel for approval prior to the issuance of any Special Permits.

5. The proposed development shall meet the following applicable design guidelines:

5.1 Dwelling units shall be grouped so that, on average, they consume no more than one (1) acre of land per dwelling, including roads, so that at least 50% of the parcel may remain open.

5.2 Lots shall be laid out, to the greatest extent feasible, to achieve the following objectives (listed

below in order of priority, as it is recognized that some may conflict with others on any given site):

- a. on the most suitable soils for sub-surface septic disposal (in unsewered areas only);
- b. on the least fertile soils for agricultural uses, and in a manner which maximizes the usable area remaining for such agricultural use;
- c. within any woodland contained in the parcel, or along the far edges of the open fields adjacent to any woodland (to reduce impact upon agriculture, to provide summer shade and shelter from winter wind, and to enable new construction to be visually absorbed by natural landscape features);
- d. in locations least likely to block or interrupt scenic vistas, as seen from the public roadway(s);
- e. in locations where the greatest number of units could be designed to take maximum advantage of solar heating opportunities; and
- f. other criteria listed in the Site Plan Review Bylaw.

5.3 Any lot facing onto a previously-existing public road shall have frontage of not less than one-hundred fifty (150) feet.

5.4 Lots not served by town sewer shall contain not less than 30,000 sq. ft., and shall have road frontage of not less than fifty (50) feet where such frontage is on a way created by the subdivision involved.

5.5 Distance between dwellings shall not be less than sixty (60) feet.

5.6 Buffer zones at least seventy-five (75) feet in width shall be required between residential and agricultural uses, and shall be thickly planted with fast-growing native shrubs and trees (such as viburnum, elderberry, winterberry, wild rose, hawthorne birch, poplar, shadbush, maple, white cedar, etc.) to create an effective barrier separating yards from fields and pastures.

6. Procedural Requirements for Reviewing Special Permits

6.1 The Planning Board is hereby directed to deliver one (1) copy of the application for Special Permit to the following boards, commissions, or committees:

Conservation Commission
Historical Commission
Board of Health
Board of Selectmen
Agricultural Incentive Committee

6.2 Special Permits shall be issued only following a public hearing held within sixty-five (65) days after the application has been filed. Notice of such public hearing shall be given in accordance with Section 11 of Chapter 40A of the Massachusetts General Laws. The Planning Board shall act within ninety (90) days following the public hearing. Failure to act within ninety (90) days following the date of the public hearing shall be deemed to be a grant of the permit applied for.

6.3 The Planning Board shall adopt, and from time to time amend, rules relative to the issuance of such permits, after presenting such proposed rule changes at a duly advertised public hearing, and shall file a copy of said rules in the office of the Town Clerk.

Appendix F.

Section 504
Compliance Guidelines of the Rehabilitation Act of 1973
Self-Evaluation Inventory

Appendix G

Maps

Map 1. Town Parcels

Map 2. Zoning

Map 3. Special Landscape Features

Map 4. Water Resources

Map 5. Open Space

Map 6. Action Plan

Appendix H

SOUTH HADLEY CHURCH AFFILIATED PROPERTY

<u>OPEN SPACE</u>	<u>LOCATION</u>	<u>MAP/LOT</u>	<u>ACRES</u>
Methodist Church	Carew Street	5A-25	_____
Methodist Church	North Main Street	5A-26	_____
Congregational Church	North Main Street	5A-81	_____
Congregational Church	North Main Street	5C-3	_____
Roman Catholic Bishop of Spfld.	30 Main Street	5C-11	_____
Roman Catholic Bishop of Spfld.	Granby Road	14-14	_____
Roman Catholic Bishop of Spfld.	Granby Road	14-15	_____
Roman Catholic Bishop of Spfld.	Granby Road	14-16	_____
Roman Catholic Bishop of Spfld.	Willimansett Street	14-17	_____
Evangelical Lutheran Church	319 Granby Road	15-40	_____
Congregational Church	113 Granby Road	16-49	_____
St. Michael's Byzantine	Roosevelt Avenue	27-275	_____
St. Michael's Byzantine	Roosevelt Avenue	27-276	_____
St. Michael's Byzantine	Lincoln Avenue	27-315	_____
St. Michael's Byzantine	Roosevelt Avenue	27-322	_____
St. Michael's Byzantine	Lincoln Avenue	27-323	_____
St. Michael's Byzantine	Lincoln Avenue	27-324	_____
St. Michael's Byzantine	Lincoln Avenue	27-325	_____
St. Michael's Byzantine	Lincoln Avenue	27-326	_____
St. Michael's Byzantine	9 Lincoln Avenue	27-327	_____
Roman Catholic Bishop of Spfld.	63 Lyman Street	29-1	_____
Roman Catholic Bishop of Spfld.	61 Lyman Street	29-62	_____
Orthodox Presbyterian Church	411 Granby Road	29-131	_____
Second Baptist Church	589 Granby Road	32-31	_____
Roman Catholic Bishop of Spfld.	4 E. Parkview Drive	38-21	_____
Roman Catholic Bishop of Spfld.	6 E. Parkview Drive	38-26	_____
Roman Catholic Bishop of Spfld.	6 E. Parkview Drive	38-27	_____
Roman Catholic Bishop of Spfld.	6 E. Parkview Drive	38-52	_____
Roman Catholic Bishop of Spfld.	646 Newton Street	40-47	_____
Second Baptist Church	21 Doane Terrace	42-49	_____
All Saint's Parish	5 Woodbridge Street	49-58	_____
Congregational Church	College Street	49-82	_____
Congregational Church	34 Woodbridge Street	52-152	_____
All Saint's Church	14 N. Sycamor Knolls	52-236	_____

SOUTH HADLEY OPEN SPACE INVENTORY

<u>Private Lands</u>	<u>Owner Manager</u>	<u>Use*</u>	<u>Map/Lot</u>	<u>Funds</u>
Forest Land 1	Private Individual	Forest	57-19	61
Forest Land 2	Private Individual	Forest	57-25	61
Forest Land 3	Private Individual	Forest	57-26	61
Old Lyman Rd. Farm 1	Private Individual	Pasture	8-1	61A
Old Lyman Rd. Farm 2	Private Individual	Productive Woodland	12-7	61A
Lyman Street Farm 1	Private Individual	Productive Woodland	14-19	61A
Willimansett St. Farm 1	Private Individual	Tillable Forage Cropland	14-43	61A
Willimansett St. Farm 2	Private Individual	Pasture	7-21	61A
Willimansett St. Farm 3	Private Individual	Truck Crops--Vegetables	14-18	61A
Pine Street Farm 1	Private Individual	Pasture	42-2B	61A
Alvord Street Farm 1	Private Individual	Pasture	42-11A	61A
Alvord Street Farm 2	Private Individual	Tillable Forage Cropland	42-12	61A
Alvord Street Farm 3	Private Individual	Pasture	42-16	61A
Alvord Street Farm 4	Private Individual	Pasture	42-58	61A
Alvord Street Farm 5	Private Individual	Pasture	43-24	61A
Alvord Street Farm 6	Private Individual	Tillable Forage Cropland	43-25	61A
Alvord Street Farm 7	Private Individual	Wetland; Scrub	43-26	61A
Alvord Street Farm 8	Private Individual	Tillable Forage Cropland	44-47	61A
Alvord Street Farm 9	Private Individual	Tillable Forage Cropland	44-48	61A
Alvord Street Farm 10	Private Individual	Pasture	45-29	61A/APR
Alvord Street Farm 11	Private Individual	Tillable Forage Cropland	42-1	61A
Alvord Street Farm 12	Private Individual	Truck Crops--Vegetables	42-5	61A
Alvord Street Farm 13	Private Individual	Pasture	42-9	61A
Alvord Street Farm 14	Private Individual	Tillable Forage Cropland	42-10	61A
Alvord Street Farm 15	Private Individual	Pasture	44-2	61A
Alvord Street Farm 16	Private Individual	Tillable Forage Cropland	44-4	61A
Alvord Street Farm 17	Private Individual	Tillable Forage Cropland	44-6	61A
Alvord Street Farm 18	Private Individual	Pasture	44-15	61A/APR
Alvord Street Farm 19	Private Individual	Truck Crops--Vegetables	45-28	61A
Brockway Lane Farm 1	Private Individual	Necessary Related Land	45-33	61A
Brockway Lane Farm 2	Private Individual	Tillable Forage Cropland	45-42	61A
Brockway Lane Farm 3	Private Individual	Truck Crops--Vegetables	47-66	61A
Brockway Lane Farm 4	Private Individual	Tillable Forage Cropland	47-68	61A
Brockway Lane Farm 5	Private Individual	Tillable Forage Cropland	47-58	61A
Hadley Street Farm 1	Private Individual	Tillable Forage Cropland	52-123	61A
Hadley Street Farm 2	Private Individual	Tillable Forage Cropland	53-25	61A
Hadley Street Farm 3	Private Individual	Tillable Forage Cropland	53-49	61A
Hadley Street Farm 4	Private Individual	Tillable Forage Cropland	54-5	61A
Hadley Street Farm 5	Private Individual	Tillable Forage Cropland	54-7	61A
Hadley Street Farm 6	Private Individual	Pasture	55-8	61A
Hadley Street Farm 7	Barstow's Farm, Inc.	Pasture	55-11	61A
Hadley Street Farm 8	Private Individual	Pasture	56-22	61A
Hadley Street Farm 9	Private Individual	Pasture	56-44	61A
Hadley Street Farm 10	Private Individual	Wetland; Scrub	56-45	61A
Hadley Street Farm 11	Private Individual	Wetland; Scrub	56-55	61A
Hadley Street Farm 12	Private Individual	Truck Crops--Vegetables	53-8	61A
Hadley Street Farm 13	Private Individual	Tillable Forage Cropland	55-12	61A

<u>Private Lands (cont.)</u>	<u>Owner Manager</u>	<u>Use*</u>	<u>Map/Lot</u>	<u>Funds</u>
Hadley Street Farm 14	Private Individual	Tillable Forage Cropland	56-56	61A
Pearl Street Farm 1	Private Individual	Pasture	56-1	61A
Pearl Street Farm 2	Private Individual	Tillable Forage Cropland	56-4	61A
Pearl Street Farm 3	Private Individual	Tillable Forage Cropland	56-29	61A
Pearl Street Farm 4	Private Individual	Wetland; Scrub	57-17	61A
Pearl Street Farm 5	Private Individual	Pasture	56-2	61A
Pearl Street Farm 6	Private Individual	Tillable Forage Cropland	56-3	61A
Pearl Street Farm 7	Private Individual	Tillable Forage Cropland	56-14	61A
Pearl Street Farm 8	Private Individual	Truck Crops--Vegetables	56-28	61A
Pearl Street Farm 9	Private Individual	Truck Crops--Vegetables	56-39	61A
Pearl Street Farm 10	Private Individual	Pasture	58-18	61A
Woodbridge St. Farm 1	Private Individual	Tillable Forage Cropland	56-47	61A
Woodbridge St. Farm 2	Private Individual	Necessary Related Land	56-47A	61A
Woodbridge St. Farm 3	Private Individual	Tillable Forage Cropland	56-48	61A
Woodbridge St. Farm 4	Private Individual	Truck Crops--Vegetables	56-38	61A
Amherst Road Farm 1	Private Individual	Tillable Forage Cropland	58-96	61A
Amherst Road Farm 2	Private Individual	Productive Woodland	59-11	61A
Amherst Road Farm 3	Private Individual	Productive Woodland	60-17	61A
Amherst Road Farm 4	Private Individual	Productive Woodland	60-27	61A
Amherst Road Farm 5	Private Individual	Wetland; Scrub	60-9	61A
Amherst Road Farm 6	Private Individual	Wetland; Scrub	60-12	61A
Granby Road Farm 1	Private Individual	Tillable Forage Cropland	29-130	61A
W. Parkview Dr. Farm 1	Private Individual	Tillable Forage Cropland	38-38	61A
College Parcel 1	Mount Holyoke College	Golfing	52-191	61B
College Parcel 2	Mount Holyoke College	Golfing	52-212	61B
College Parcel 3	Mount Holyoke College	Golfing	52-164	61B
College Parcel 4	Mount Holyoke College	Historic Buildings	52-180	
College Parcel 5	Mount Holyoke College		39-7	
College Parcel 6	Mount Holyoke College		39-76	
College Parcel 7	Mount Holyoke College		46-68	
College Parcel 8	Mount Holyoke College		47-65	
College Parcel 9	Mount Holyoke College		48-2	
College Parcel 10	Mount Holyoke College		48-9	
College Parcel 11	Mount Holyoke College		48-10	
College Parcel 12	Mount Holyoke College		48-16	
College Parcel 13	Mount Holyoke College		48-20	
College Parcel 14	Mount Holyoke College		48-21	
College Parcel 15	Mount Holyoke College		49-30	
College Parcel 16	Mount Holyoke College		49-81	
College Parcel 17	Mount Holyoke College		50-4	
College Parcel 18	Mount Holyoke College		50-41	
College Parcel 19	Mount Holyoke College		50-42	
College Parcel 20	Mount Holyoke College		55-1	
Cemetery Parcel 1	Evergreen Cem. Assoc.	Cemetery	47-48	
Cemetery Parcel 2	Evergreen Cem. Assoc.	Cemetery	47-64	
Cemetery Parcel 3	Evergreen Cem. Assoc.	Cemetery	49-65	
Cemetery Parcel 4	Evergreen Cem. Assoc.	Cemetery	49-66	
Girl Scout Parcel 1	West. Mass. Girl Scouts	Scout Camp	56-61	
Girl Scout Parcel 2	West. Mass. Girl Scouts	Scout Camp	56-85	
Industrial Garden	GTI	Light Industrial	23-48	
Swimming Club	SHSwimmingClub Inc.	Private Swim Club	58-83	
Canoe Club	Redcliffe Canoe Club	River Canoeing	20-43	

Canoe Club	Redcliffe Canoe Club	River Canoeing	20-44	_____
Canoe Club	Redcliffe Canoe Club	River Canoeing	20-45	_____

* Chapter 61 Land Uses are as designated in assessor's records.

<u>Public Lands</u>	<u>Owner/Manager</u>	<u>Use</u>	<u>Map/Lot</u>	<u>Funds</u>
Public Parcel 1	Town	_____	3B-3	_____
Public Parcel 2	Town	_____	3B-19	_____
Public Parcel 3	Town	_____	3B-20	_____
Utility Parcel 1	Holyoke Water Power	_____	4B-74	_____
Utility Parcel 2	Holyoke Water Power	_____	4D-26	_____
Utility Parcel 3	Holyoke Water Power	_____	4D-28	_____
Utility Parcel 4	Holyoke Water Power	_____	5C-46	_____
Utility Parcel 5	Holyoke Water Power	_____	5C-47	_____
Utility Parcel 6	Holyoke Water Power	_____	5C-49	_____
Beachgrounds 1	Town	Recreation Fields	5D-95	_____
Beachgrounds 2	Town	Recreation Fields	5D-96	_____
Beachgrounds 3	Town	Recreation Fields	5D-97	_____
Buttery Brook 1	Town	Playgrounds	7-7	_____
Buttery Brook 2	Town	_____	7-25	_____
Buttery Brook 3	Town	_____	7-117	_____
Public Parcel 4	Town	_____	8-102	_____
Public Parcel 5	Town	_____	9-3	_____
Public Parcel 6	Conservation Comm.	_____	10-1	Self-Help
Landfill	Town	Landfill	12-8	_____
Public Parcel 7	Town	_____	14-38	_____
Public Parcel 8	Conservation Comm.	_____	15-78	_____
Plains School	Town	Playgrounds	15-116	_____
Public Parcel 9	Forestry Committee	_____	15-117	_____
S.H. High School	Town	Ball Fields	17-15	_____
Public Parcel 10	Town	_____	17-16	_____
Public Parcel 11	Conservation Comm.	_____	17-17	Self-Help
Utility Parcel 7	Holyoke Water Power	_____	20-46	_____
Canal Park	Town	River Frontage	20-63	_____
Cove Island	Holyoke Water Power	Leased to Town	22-1	_____
Public Parcel 12	Town	River Frontage	23-1	Self-Help
Utility Parcel 8	Holyoke Power&Elec.	_____	26-41	_____
Public Parcel 13	Conservation Comm.	Wetland	27-41	_____
Woodlawn School	Town	Playgrounds	28-154	_____
Stony Brook	Conservation Soc.**	_____	37-93	_____
Middle School	Town	Ball Fields	38-1	_____
Warner Cons. Area	Conservation Comm.	_____	38-12	_____
Mosier School	Town	Playgrounds	38-19	_____
Public Parcel 14	Conservation Comm.	_____	39-69	_____
Public Parcel 15	Town	Wetland	40-4	_____
Public Parcel 16	Town	Wetland	40-5	_____
Utility Parcel 9	Holyoke Power&Elec.	Utility Lines	42-8	_____
Utility Parcel 10	Holyoke Power&Elec.	Utility Lines	42-9	_____
Utility Parcel 11	Holyoke Power&Elec.	Utility Lines	42-20	_____
Utility Parcel 12	Holyoke Power&Elec.	Utility Lines	42-32	_____
Utility Parcel 13	Holyoke Power&Elec.	_____	42-57	_____
Public Parcel 17	Conservation Comm.	River Frontage	43-17	Self-Help
Public Parcel 18	Town	River Frontage	43-23	_____

<u>Public Lands (cont.)</u>	<u>Owner/Manager</u>	<u>Use</u>	<u>Map/Lot</u>	<u>Funds</u>
Utility Parcel 14	Holyoke Water Power		45-2	_____
Utility Parcel 15	Holyoke Power&Elec.	Utility Lines	45-23	_____
Public Parcel 19	Town		46-1	_____
Center School	Town	Playgrounds	47-33	_____
Public Parcel 20	Conservation Soc.**	Outdoor Recreation	52-31	_____
Utility Parcel 16	Holyoke Power&Elec.		53-1	_____
Utility Parcel 17	Holyoke Power&Elec.		53-2	_____
Utility Parcel 18	Holyoke Power&Elec.		53-3	_____
Utility Parcel 19	Holyoke Water Power		53-4	_____
Utility Parcel 20	Holyoke Water Power		53-12	_____
Utility Parcel 21	Holyoke Water Power		53-13	_____
Utility Parcel 22	Holyoke Power&Elec.		53-14	_____
Utility Parcel 23	Holyoke Water Power		53-15	_____
Town Farm Parcel	Town	Recreation Fields	53-16	_____
Utility Parcel 24	Holyoke Water Power		53-17	_____
Utility Parcel 25	Holyoke Water Power		53-18	_____
Utility Parcel 26	Holyoke Water Power		53-19	_____
Public Parcel 21	Fire District #2	Watershed Protection	54-8	_____
Utility Parcel 27	Holyoke Power&Elec.		54-16	_____
Public Parcel 22	State	Outdoor Recreation	55-2	DEM
Public Parcel 23	Conservation Soc.**	Outdoor Recreation	55-3	_____
Public Parcel 24	Conservation Soc.**	Outdoor Recreation	57-1	_____
Public Parcel 25	State	Outdoor Recreation	57-2	DEM
Public Parcel 26	State	Outdoor Recreation	57-6	DEM
Public Parcel 27	State	Outdoor Recreation	57-7	DEM
Public Parcel 28	Conservation Soc.**	Outdoor Recreation	57-5	_____
Public Parcel 29	Fire District #2	Watershed Protection	57-12	_____
Public Parcel 30	State	Outdoor Recreation	57-13	DEM
Public Parcel 31	State	Outdoor Recreation	57-14	DEM
Public Parcel 32	Town	Outdoor Recreation	57-18	_____
Public Parcel 33	Fire District #2	Watershed Protection	57-23	_____
Public Parcel 34	Conservation Soc.**	Outdoor Recreation	57-27	_____
Public Parcel 35	Conservation Soc.**	Outdoor Recreation	57-28	_____
Public Parcel 36	Fire District #2	Watershed Protection	57-29	_____
Public Parcel 37	State	Outdoor Recreation	57-30	DEM
Public Parcel 38	Fire District #2	Watershed Protection	58-17	_____
Public Parcel 39	Fire District #2	Watershed Protection	58-19	_____
Public Parcel 40	Fire District #2	Watershed Protection	58-20	_____
Public Parcel 41	Fire District #2	Watershed Protection	59-1	_____
Public Parcel 42	Fire District #2	Watershed Protection	59-2	_____
Public Parcel 43	Fire District #2	Watershed Protection	59-3	_____
Public Parcel 44	Fire District #2	Watershed Protection	59-5	_____
Public Parcel 45	Fire District #2	Watershed Protection	59-6	_____
Public Parcel 46	Fire District #2	Watershed Protection	59-7	_____
Public Parcel 47	State	Skinner State Park	59-9	DEM
Public Parcel 48	State	Skinner State Park	59-10	DEM
Public Parcel 49	Fire District #2	Watershed Protection	59-15	_____
Public Parcel 50	Town	Outdoor Recreation	60-33	_____
Public Parcel 51	State	Outdoor Recreation	60-34	DEM
Public Parcel 52	Forestry Committee	Outdoor Recreation	61-8	_____
Public Parcel 53	Conservation Soc.**	Outdoor Recreation	61-9	_____
Public Parcel 54	Town	Outdoor Recreation	61-10	_____

<u>Public Lands (cont.)</u>	<u>Owner/Manager</u>	<u>Use</u>	<u>Map/Lot</u>	<u>Funds</u>
Public Parcel 55	State	Outdoor Recreation	61-11	DEM
Public Parcel 56	State	Outdoor Recreation	61-12	DEM
Public Parcel 57	State	Outdoor Recreation	61-14	DEM
Public Parcel 58	Town	Outdoor Recreation	61-15	
Public Parcel 59	State	Outdoor Recreation	61-16	DEM
Public Parcel 60	Fire District #2	Watershed Protection	62-1	
Public Parcel 61	Fire District #2	Watershed Protection	62-2	
Public Parcel 62	Fire District #2	Watershed Protection	62-3	
Public Parcel 63	Fire District #2	Watershed Protection	62-4	
Public Parcel 64	Fire District #2	Watershed Protection	62-5	
Public Parcel 65	Fire District #2	Watershed Protection	62-6	
Public Parcel 66	Fire District #2	Watershed Protection	62-7	
Public Parcel 67	State	Skinner State Park	62-8	DEM
Public Parcel 68	Fire District #2	Watershed Protection	62-9	
Public Parcel 69	State	Skinner State Park	62-11	DEM
Public Parcel 70	Fire District #2	Watershed Protection	62-12	
Public Parcel 71	Fire District #2	Watershed Protection	62-13	
Public Parcel 72	State	Skinner State Park	62-15	DEM
Public Parcel 73	Town	Outdoor Recreation	62-16	
Public Parcel 74	State	Skinner State Park	63-1	DEM
Public Parcel 75	State	Outdoor Recreation	63-2	DEM
Public Parcel 76	Fire District #2	Watershed Protection	63-3	
Public Parcel 77	Fire District #2	Watershed Protection	63-4	
Public Parcel 78	Fire District #2	Watershed Protection	63-5	
Public Parcel 79	Fire District #2	Watershed Protection	63-6	
Public Parcel 80	State	Outdoor Recreation	63-7	DEM
Public Parcel 81	Conservation Soc.**	Outdoor Recreation	63-8	

**** Conservation Society is presently defunct, properties should revert to Conservation Commission**

<u>Non-Profit Lands</u>	<u>Owner/Manager</u>	<u>Use</u>	<u>Map/Lot</u>	<u>Funds</u>
Kestrel Trust Parcel	Kestrel Land Trust	Range Preservation	57-15	Private
Connecticut River Watershed Council		Wetland Protection	23-45	Private

**SOUTH HADLEY
LANDS OF RECREATION POTENTIAL**

<u>Private Lands</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Forest Lands 1				Agriculture	Minimal
Forest Land 2					
Forest Land 3					
Old Lyman Rd. Farm 1					
Old Lyman Rd. Farm 2					
Lyman Street Farm 1					
Willimansett St. Farm 1					
Willimansett St. Farm 2					
Willimansett St. Farm 3					
Pine Street Farm 1					
Alvord Street Farm 1					
Alvord Street Farm 2					
Alvord Street Farm 3					
Alvord Street Farm 4					
Alvord Street Farm 5					
Alvord Street Farm 6					
Alvord Street Farm 7					
Alvord Street Farm 8					
Alvord Street Farm 9					
Alvord Street Farm 10					
Alvord Street Farm 11					
Alvord Street Farm 12					
Alvord Street Farm 13					
Alvord Street Farm 14					
Alvord Street Farm 15					
Alvord Street Farm 16					
Alvord Street Farm 17					
Alvord Street Farm 18					
Alvord Street Farm 19					
Brockway Lane Farm 1					
Brockway Lane Farm 2					
Brockway Lane Farm 3					
Brockway Lane Farm 4					
Brockway Lane Farm 5					
Hadley Street Farm 1					
Hadley Street Farm 2					
Hadley Street Farm 3					
Hadley Street Farm 4					
Hadley Street Farm 5					
Hadley Street Farm 6					
Hadley Street Farm 7					
Hadley Street Farm 8					
Hadley Street Farm 9					
Hadley Street Farm 10					
Hadley Street Farm 11					
Hadley Street Farm 12					
Hadley Street Farm 13					

<u>Private Lands (cont.)</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Hadley Street Farm 14					
Pearl Street Farm 1					
Pearl Street Farm 2					
Pearl Street Farm 3					
Pearl Street Farm 4					
Pearl Street Farm 5					
Pearl Street Farm 6					
Pearl Street Farm 7					
Pearl Street Farm 8					
Pearl Street Farm 9					
Pearl Street Farm 10					
Woodbridge St. Farm 1					
Woodbridge St. Farm 2					
Woodbridge St. Farm 3					
Woodbridge St. Farm 4					
Amherst Road Farm 1					
Amherst Road Farm 2					
Amherst Road Farm 3					
Amherst Road Farm 4					
Amherst Road Farm 5					
Amherst Road Farm 6					
Granby Road Farm 1					
W. Parkview Dr. Farm 1					
College Parcel 1					
College Parcel 2					
College Parcel 3					
College Parcel 4					
College Parcel 5					
College Parcel 6					
College Parcel 7					
College Parcel 8					
College Parcel 9					
College Parcel 10					
College Parcel 11					
College Parcel 12					
College Parcel 13					
College Parcel 14					
College Parcel 15					
College Parcel 16					
College Parcel 17					
College Parcel 18					
College Parcel 19					
College Parcel 20					
Cemetery Parcel 1					
Cemetery Parcel 2					
Cemetery Parcel 3					
Cemetery Parcel 4					
Girl Scout Parcel 1					
Girl Scout Parcel 2					
Industrial Garden					

<u>Private Lands (cont.)</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Swimming Club					
Canoe Club					
Canoe Club					
Canoe Club					

<u>Public Lands</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Public Parcel 1					
Public Parcel 2					
Public Parcel 3					
Utility Parcel 1					
Utility Parcel 2					
Utility Parcel 3					
Utility Parcel 4					
Utility Parcel 5					
Utility Parcel 6					
Beachgrounds 1					
Beachgrounds 2					
Beachgrounds 3					
Buttery Brook 1					
Buttery Brook 2					
Buttery Brook 3					
Public Parcel 4					
Public Parcel 5					
Public Parcel 6					
Landfill					
Public Parcel 7					
Public Parcel 8					
Plains School					
Public Parcel 9					
S.H. High School					
Public Parcel 10					
Public Parcel 11					
Utility Parcel 7					
Canal Park					
Cove Island					
Public Parcel 12					
Utility Parcel 8					
Public Parcel 13					
Woodlawn School					
Stony Brook					
Middle School					
Warner Cons. Area					
Mosier School					
Public Parcel 14					
Public Parcel 15					
Public Parcel 16					
Utility Parcel 9					
Utility Parcel 10					
Utility Parcel 11					

<u>Public Lands (cont.)</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Utility Parcel 12					
Utility Parcel 13					
Public Parcel 17					
Public Parcel 18					
Utility Parcel 14					
Utility Parcel 15					
Public Parcel 19					
Center School					
Public Parcel 20					
Utility Parcel 16					
Utility Parcel 17					
Utility Parcel 18					
Utility Parcel 19					
Utility Parcel 20					
Utility Parcel 21					
Utility Parcel 22					
Utility Parcel 23					
Town Farm Parcel					
Utility Parcel 24					
Utility Parcel 25					
Utility Parcel 26					
Public Parcel 21					
Utility Parcel 27					
Public Parcel 22					
Public Parcel 23					
Public Parcel 24					
Public Parcel 25					
Public Parcel 26					
Public Parcel 27					
Public Parcel 28					
Public Parcel 29					
Public Parcel 30					
Public Parcel 31					
Public Parcel 32					
Public Parcel 33					
Public Parcel 34					
Public Parcel 35					
Public Parcel 36					
Public Parcel 37					
Public Parcel 38					
Public Parcel 39					
Public Parcel 40					
Public Parcel 41					
Public Parcel 42					
Public Parcel 43					
Public Parcel 44					
Public Parcel 45					
Public Parcel 46					
Public Parcel 47					
Public Parcel 48					

<u>Public Lands (cont.)</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Public Parcel 49					
Public Parcel 50					
Public Parcel 51					
Public Parcel 52					
Public Parcel 53					
Public Parcel 54					
Public Parcel 55					
Public Parcel 56					
Public Parcel 57					
Public Parcel 58					
Public Parcel 59					
Public Parcel 60					
Public Parcel 61					
Public Parcel 62					
Public Parcel 63					
Public Parcel 64					
Public Parcel 65					
Public Parcel 66					
Public Parcel 67					
Public Parcel 68					
Public Parcel 69					
Public Parcel 70					
Public Parcel 71					
Public Parcel 72					
Public Parcel 73					
Public Parcel 74					
Public Parcel 75					
Public Parcel 76					
Public Parcel 77					
Public Parcel 78					
Public Parcel 79					
Public Parcel 80					
Public Parcel 81					

<u>Non-Profit Lands</u>	<u>Condition</u>	<u>Recreation Potential</u>	<u>Public Access</u>	<u>Zoning</u>	<u>Degree of Protection</u>
Kestrel Trust Parcel					
Connecticut River					
Watershed Council					