

Chapter IX

Conservation, Preservation, and Open Space

Introduction

The Conservation, Preservation, and Open Space chapter is a study of Hopkinton's environment that includes our open space systems, watersheds, soils, bedrock, topography, brooks, rivers, streams, wetlands, forests, drinking water resources, and our built environment, as it relates to these natural resources.

Hopkinton residents have traditionally supported strong conservation and preservation measures to protect the rich array of natural and cultural resources found in the community. This attitude continues to prevail, as shown by the results of the Master Plan Survey, where 60% of Hopkinton residents responding supported the idea that the Town should appropriate money to be used for the protection and preservation of natural, cultural, and historic resources. In addition, the visioning sessions conducted at the beginning of the Master Plan process indicated a strong desire for the protection of our natural resources.

In periods of development, such as the one we are currently experiencing, towns tend to be reactive toward development proposals. They tend to allow development without sending a clear message to developers about what the Town really wants. Because of serious growth pressures, it is imperative that a coordinated effort to protect valuable locally and regionally significant environmental areas occurs in the near future. This effort would be best utilized if municipalities worked across political boundaries to coordinate and plan for natural resource preservation, conservation, and protection.

The vision established by this chapter is to continue to concentrate the growth and development of Hopkinton within the traditional core areas of Town. Within the more rural areas, the goal is to protect and interconnect, through a greenway and open space network, tracts of land with important ecological, visual, aesthetic, and community value.

To achieve the goals and recommendations of this chapter, the Town should not view this plan as a static document that lays out precisely what needs to be done for the next ten years, although in some cases we are able to do just that. But in general, this chapter is more like a lens focusing our attention on certain critical environmental and resource issues that need to be monitored and that, in some cases, we need to learn more about at a fundamental level. The idea is to steadily increase our information base regarding issues that we know to be important, make that information available to the public and decision makers in an accessible, clear, and consistent manner, and to use that information not only to refine management plans, but also to target and prioritize the need for additional information. It is useful to think of this chapter as adaptive in the sense it can be adjusted as we learn more about the dynamic environmental systems in which we live.

In this Chapter, the following topics will be explored:

Key Findings	
Community Survey and Visioning Session Results	
Soils	Slope Analysis
Surface Water Resources	Wetlands
Drinking Water and Aquifer Protection	Sand and Gravel Deposits
Farmland	Wildlife Habitat Management
Species of Special Concern	Greenways and Trails
Scenic Views	Forests
Lands Identified for Conservation	
Strategies to Meet Conservation Goals	Summary

Key Findings

- All land use activities that have a direct impact on the soil should be performed in such a way as to minimize any negative impacts and be located on sites suitable for such activity.
- The Town should provide for comprehensive protection of the wetlands and shoreland through regulatory, educational, and voluntary efforts.
- The Town should identify critical habitats and lands, including large blocks of undeveloped land, travel corridors, agricultural lands, scenic views, and other areas of conservation, recreational, and ecological value and initiate efforts to protect those areas.
- Research the possibility of creating an Aquifer Protection District that would provide comprehensive protection for the aquifer resource based on scientific findings, while at the same time ensuring the provisions are reasonable and enforceable.
- Develop a conservation development approach for the design of subdivisions and developments, particularly within those areas identified as unfragmented in town. A conservation development approach will recognize the right and ability of a landowner to use his/her land, but minimize the fragmentation of the habitat.
- Expand and strengthen the Hopkinton greenway system through the acquisition of land or conservation easements that would link conservation parcels that the Town currently owns or has easements on. This acquisition should be through donations, purchase, or partnerships with public or private conservation groups. A conservation fund should be maintained to allow the Town to qualify for matching funds, as opportunities arise.

Community Survey and Visioning Session Results

At the beginning of the Master Plan process, a survey was sent out to every household and non-resident property owner in the Town of Hopkinton. Of the 2,700 surveys sent out, there were 973 surveys returned, for a 36% response rate. The following three questions, which were included in the survey, directly relate to the topics covered in this Chapter.

What are the desirable features of the Town of Hopkinton? (Check all that apply)

Feature	Total Responses
Small Town / Rural Atmosphere	852
Scenic Areas	431
Natural Resources	293

Should the Town appropriate money to be used for the protection and preservation of natural, cultural and historic resources?

Answer	Total	Percentage
Yes	589	60.5%
No	117	12.0%
No Opinion	168	17.3%
No Answer	99	10.2%
Total	973	100.0%

In order to help Town Officials better direct their efforts to meet the needs of the community, we need your opinion on the relative importance/rating on the following issues. Check all that apply.

Issues	More	Same	Less	No Opinion	No Answer
Protection of ground and surface water	508	301	11	52	101
Protection of woodlands and wildlife habitat	430	373	25	55	90
Preservation of farmland and pastures	430	351	31	68	93
Expansion of Town forests/conservation lands	381	354	55	80	103
Designation and protection of wetlands	353	386	64	72	98

In May 2000, a community Visioning Session was held, in which community participants were asked several questions. The following were some of the individual, participant responses that relate to conservation, preservation, and open space.

What would you like Hopkinton to look like 75 years from now?

All commercial developments have green space	Continue to have operating farms
Large blocks of habitat with healthy eco-systems	Functional farms
Maintain rural character	River access
Large blocks of wooded land	Unpaved roads
Open land	Encourage tree farms
Open space subdivisions	Preserving water resources
Expand recycling, reduce consumption	Wetlands protection
Recreation and habitat connection to conservation lands	
Include trees and open areas for wildlife habitat, visual, and aesthetics	

What are the Town's strengths and opportunities?

Rural Atmosphere	Conservation Land
George's Park	Unpaved Class VI Roads
Gould Hill Orchards	Active Farms
Pedestrian access along riverbank	Encourage farming
Quiet access to Town-owned bodies of water	
Cluster development with conservation/open space land	

What are the Town's weaknesses or areas of concern?

Community knowledge of Town-owned land	
Access to open space and conservation lands	
Inappropriate and incompatible development	
Loss of land (Kimball Lake)	Elimination of Class VI Roads
Maintenance of Town land	Land fragmentation

When looking at the responses gathered from the participants at the Visioning Session, two main themes that are repeated throughout are the desire to retain and improve Hopkinton's rural, agricultural character and the desire to increase access and availability of conservation lands and open space.

Soils

One of the most important natural resources and determinants of land use is soils. This is particularly important in Hopkinton, which has a limited public sewer district and two limited public water districts. Information about soil characteristics, with other support data, allows a community to make sound land planning decisions.

The upper layers of geological materials (rocks and soils) on the bedrock (the crustal rock under the soil) were deposited by the last glaciation (Pleistocene), particularly the Wisconsin stage. As the ice melted, the glacial debris formed two types of deposits:

- A. Direct deposits falling or dumped by the ice as unsorted glacial till (hardpan); or
- B. Outwash deposits of sand, gravel, silt, and clay sorted out by the meltwater running off the ice (Glacio-Fluvial). These latter deposits were carried farther by streams and rivers into the valleys. The Contocook River Valley, being a

temporary lake (Glacial Lake Contoocook) as the ice was melting, has lake floor deposits of sandy silt and clay.

The following describes the various resulting glacial landscape features:

- A. Direct Deposits (Till)
 - 1. Ground Moraine -- Mostly till overlying bedrock but includes outcrops of uncovered bedrock. It is the unsorted, glacially ground-up debris of clay, silt, sand, gravel, and boulders dumped under the glacial ice and now covering bedrock. It was not distributed by meltwater. Morphologically, it is a zone of small hills and basins.
 - 2. Drumlins -- Low, humpbacked elliptical hills or mounds of till deposited and shaped by the moving glacier; the long axis is parallel to the ice motion.
- B. Outwash Deposits (sand, gravel, silt and clay)
 - 1. Outwash Plains -- A broad almost flat topped deposit of sorted sand and gravel layers, built up by the streams of glacial meltwater flowing off from the stagnant glacier.
 - 2. Kame and Kame Terraces -- A hill, hummock, or short irregular ridge of stratified sand and gravel deposited in contact with the glacial ice; when the ice melted, the deposit settled to its present form. They range from 5 to 100 feet high. A kame terrace is a body of crudely sorted sand and gravel deposited between the glacier and an adjacent valley wall, thus forming the rather flat-topped terraces.
 - 3. Eskers -- Narrow, sinuous ridges of crudely stratified gravel and sandy gravel 10 to 100 feet high, deposited by meltwater streams flowing beneath the glacier in stream tunnels.
 - 4. Varved Clays -- Glacial clays of alternating sandy silt and silty layers, deposited in glacial lakes.

Since the last glacial ice melted away 14,500 years ago, three other major soil deposits have developed:

- 1. Organic Deposits -- Peat and muck soils found in marshes, swamps, bogs, and other wetlands; they represent formerly or presently ponded depressions where plant remains have accumulated and decayed over time.
- 2. Flood Plains -- Large areas of sandy or silty alluvium (stream deposits) left by previously muddy flood water; usually broad and flat due to the slow accumulation of this alluvium during the waning stages of each flood.
- 3. Topsoil -- Generally less than one foot thick composed of weathered glacial deposits and organic matter (humus).

In Hopkinton, the majority of the surficial geology is ground moraine. The other large categories are Kames, Kame Terraces, glacial lake floor deposits (Lacustrine), and flood plains. Much of this appears to follow the water corridors. There are also some drumlins, outwash plains, and small organic deposits.

There are two major types of bedrock that underlie the Town of Hopkinton: a hard igneous rock commonly referred to as granite and a metamorphosized form of sedimentary rock which is much softer. The granite bedrock is suitable for aggregate mining, while the meta-sedimentary rocks are porous and more easily contaminated. Both types are currently being used as a drinking

water source by many homeowners and the Town, via drilled wells. Bedrock is a nonrenewable resource. It is difficult to remediate most forms of contamination in it and it may contain natural hazards, such as radon and arsenic.

The metamorphic rocks are quite fractured, and even though some of them have a high iron and sulfur content, wells drilled into these rocks generally yield adequate supplies of household water. Some of the igneous rocks are not as fractured and generally yield smaller quantities of less mineral rich water.

In general, soils can be grouped into seven main categories: wetland, seasonal wet, sandy and gravelly, shallow to bedrock, hardpan, deep and stony, and clayey. The other category includes gravel pits and "made" land fill.

The data below indicates that sixteen percent of the land should not be developed due to water and wetlands and another eight percent is subject to being wet seasonally. Over half of the soils are either deep and stony or sandy and gravelly. It is important for the Town to be aware of the soil conditions, classifications, and limitations in order to have appropriate and suitable land use plans and zoning requirements.

Type	Number of Acres	Percent
Wetland	4,390	16%
Seasonal Wet	2,275	8%
Sandy and Gravelly	7,255	26%
Shallow to Bedrock	1,950	7%
Hardpan	2,900	10%
Deep and Stony	7,705	28%
Clayey	690	2%
Other	800	3%

Source: Hopkinton Master Plan Update, 1987

Soils are a renewable resource, but because of the long time period required to be replenished, they can easily be classified as non-renewable. In addition to offering many environmental and agricultural benefits, soils are subject to contamination, erosion, and depletion at an alarming rate. Productive soils for farming and forestry are often prime development sites, and once built on, they then become unavailable for those essential uses.

Recommendations:

- Inform and educate land owners, who perform land use activities that may impact the soil, of existing State regulations, as well as the recommended best management practices, regarding such land use activities.
- In the zoning ordinance, implement soil based lot sizing requirements, as outlined in the 1997 Rockingham County Conservation District "Ad-Hoc Soil Based Lot Sizing Study," as amended.
- Soils should be respected and protected as a valuable resource. All land use activities that have a direct impact on the soil should be performed in such a way as to minimize any negative impacts and be located on sites suitable for such activity.
- Through the Subdivision and Site Plan Review Regulations, require new developments to submit site specific soil data to ensure that new developments have adequate carrying capacity for such proposed uses. Site specific data submittals should be

consistent with "Requirements for Soils and Wetlands Data in Subdivision and Site Plan Review Regulations" prepared by NH OSP in 1999. Site specific data, in addition to wetlands data, should be required under the following situations: (1) average lot size is less than 2 acres without public water and sewer, (2) average lot size less than 1 acre with municipal water but without municipal sewer, (3) non-limiting non-wetland contiguous area greater than 20,000 square feet and without municipal water and sewer, or (4) areas without municipal water and sewer and with multiple soil complexes with dramatically different characteristics on the same lot.

- Ensure that any activities involving bedrock, or those that have the potential to involve bedrock, be analyzed to ensure that the water resources within the bedrock will not be affected, or at least not have a negative impact on abutting users.
- Require a complete analysis of the impact on the bedrock resources when a large scale development proposes to use or alter the natural bedrock structure.

Slope Analysis

Slope is a very critical consideration in land use planning because it affects the capability and suitability of land to support development, as it relates to the site and the building, septic system and building design costs, and environmental impacts, such as runoff, erosion, sedimentation, and pollution. Slope is the ratio of change in vertical elevation in relation to the change in horizontal distance, multiplied by 100 percent. The percent of slope may indicate the potential for environmental problems. Land with no slope, such as wetlands, and land with steep slopes may not be suitable for any development. There are five slope classifications, which are described below.

0-3% Flat

Land in this category can be regarded as essentially level. The slope would indicate easy accommodation of almost all types of land use. Much of the land in this category lies within the flood plains of the major rivers. Other flat lands in this category may have drainage problems if the soil proves to be relatively impermeable. Land in this category is generally best restricted to pasture and grazing, public open space, recreational use, farming, or appropriately planned development that takes into consideration the necessary environmental factors and conditions.

3-8% Gently Sloping

Land in this category is suitable for many uses. The slopes are not prohibitive for development and make for excellent natural drainage conditions. Most of the land in this category may be found within the valley floors and river terraces.

8-15% Moderately Sloping

Slopes of this range begin to be restrictive for certain land uses. The slopes may also prove too steep for most farming purposes. Low density residential development may be feasible if carefully planned.

15-25% Steep Slopes

Excavation and grading are almost always required, yet development not intensive in its coverage may be accommodated with limited environmental impact, if carefully planned.

Over 25% Very Steep Slopes

These lands are most subject to adverse environmental impacts and heavy construction costs. Intensive use of land should be done cautiously with the recognition that the interest and amenity provided by such lands makes them a valuable recreational resource and an area of the increasing demand for residential housing "with a view."

In Hopkinton, the majority of land has a slope of less than eight percent. Much of this area is in the Hopkinton-Everett Reservoir and the related river corridors. There are, however, a few areas with steep slopes, as can be seen on the **Steep Slope and Scenic Vista Map**, and by the list below:

<u>Name</u>	<u>Height</u>
Shaker Hill	923'
Gould Hill	840'
Irish Hill	780'
Putney Hill	780'
Beech Hill	780'
Clement Hill	740'
Mt. Hope	740'
Dimond Hill	660'
Rattlesnake Hill	640'

Moderately to severely sloped land is subject to erosion during almost any type of land use activity. Whereas much of the easily developable land within the Town has been built upon, developers and home builders are focusing on the more sloped terrain. Potential views from such slopes have increased both the demand and value of those sites. This increase has created problems for utility placement, as well as for service road and driveway location and construction. Building on ridgelines may have the potential to diminish the scenic quality of the ridgeline.

Recommendations:

- Interruptions in ridge-lines should be avoided and structures should be designed to blend in with the background, if such structures are visible from the Town's population center and highways.
- Ensure that required siltation and sedimentation controls are in place prior to the start of construction activity and that they remain functional during the entire construction process. Erosion and sedimentation control measures shall be in accordance with "Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire," as prepared by the NH DES, Rockingham County Conservation District, and USDA Soil Conservation Service, August 1992.
- All roads and driveways should be designed in a manner to allow the safe passage and access of emergency vehicles during inclement weather. For new development, the Planning Board should require the design and location of roads and driveways to be as minimal impact as possible in areas of steep slopes.
- In the Town Health Regulations, septic system maintenance schedules and inspections should be encouraged to reduce the chance of on-site system failure, which may impact ecological systems beyond the property line.
- Encourage steep slopes to be used for recreation purposes, such as hiking, cross country skiing, and others that do not alter the natural surface configuration or vegetative cover of the land.
- In the site and subdivision review regulations, the Planning Board should adopt a clear standard for measuring slope for proposed developments.

- The Planning Board should encourage developers to protect steep slopes with slope easements.
- Create slope development standards that protect the environment and safety in both the short and long term, as well as the aesthetics from both near and far observation points within the Town.

Surface Water Resources

Floodplains were created as the Contoocook River naturally flooded, before the Hopkinton-Everett Dam was constructed, and are continually being modified by the river. Flooding is a natural process of the river system that serves to slow floodwaters, thus reducing damage further downstream. Flooding also deposits minerals for the soil and recharges groundwater resources, as well as provide habitat to a wide variety of plants and animals.

Hopkinton lies within the Contoocook Sub-basin of the larger Merrimack Drainage Basin. The Contoocook River drainage area covers about 766 square miles. River systems link communities. The effect of community actions regarding rivers can affect the downstream water quality and quantity for other communities. The Blackwater, Contoocook and Warner Rivers flow through Hopkinton. The primary brooks in Hopkinton which all flow into the Contoocook River are Dolf Brook, Deer Meadow Brook, and Hardy Spring Brook. The following chart gives data on the number of miles of river/stream/ponds through Hopkinton.

Name	Source	Length/Size in NH	Length/Size in Hopkinton
Blackwater River	Andover	41 miles	1 mile
Contoocook River	Rindge	71 miles	10.5 miles
Warner River	Bradford	22 miles	1 mile
Dolf Brook	Hopkinton	4.5 miles	4.25miles
Deer Meadow Brook	Salisbury	12.5 miles	1 mile
Smith Pond Bog	Hopkinton	15 acres	15 acres
Carr Pond	Hopkinton/Henniker	11 acres	N/A
Grassey Pond	Hopkinton/Henniker	20 acres	N/A
Kimball Pond	Hopkinton	75 acres	75 acres
Rolf Pond	Hopkinton	30 acres	30 acres
Browns Brook	Hopkinton	1.7 miles	1.7 miles
Drew Lake	Hopkinton	38 acres	38 acres
Clement Pond/Josilvia Lake	Hopkinton	100 acres	100 acres
Hopkinton-Everett Lakes Reservoir	Rindge	8,000 acres	2,820 acres
Whittier Pond	Hopkinton	14 acres	14 acres
One Stack Brook	Hopkinton	3.1 miles	2.1 miles
Boutwell Mill Brook	Hopkinton	3.7 miles	2.9 miles
Hardy Spring Brook	Henniker/Warner	5 miles	4 miles

Source: Hopkinton Master Plan Update, 1987;
1998 Natural, Cultural, and Historical Resources Inventory, CNHRPC

Ponds

The Hopkinton-Everett Lakes Reservoir protects Contoocook and other towns and cities along the River from flooding. It provides Hopkinton with a variety of recreational opportunities including Elm Brook Park, and is formed by a dam on the Contoocook River in West Hopkinton, and the Everett Flood Control Dam on the Piscataquog River in Weare. Two dikes and a spillway controlling a 426 square mile drainage area are also located in Hopkinton. According to the 1979 Master Plan, "650 acres of permanent water are available to the general public in the towns of Henniker, Weare, Hopkinton and Dunbarton." The major bodies of water involved in the reservoir that are located in Hopkinton are : Contoocook River, Pool Canal No. 1, Elm Brook Pool and Marsh, Stumpfield Pond and Marsh, Drew Lake, and Canal No. 2.

Drew Lake lies southeast of the Hopkinton-Everett Reservoir. It has an area of approximately 38 acres in size and is a popular fishing site.

Whittier Pond, also called Fry Pond, lies north of Hopkinton Road, in the eastern part of Hopkinton. It is a natural pond that has been raised by damming and is 14 acres in size with an average depth of four feet.

Kimball Lake is approximately 75 acres in size. This man-made pond and the log cabins on it are used by the Town as a recreation area. It serves as a tributary to Dolf Brook.

Clement Pond, also called Lake Josilvia, is 100 acres in size and has a maximum depth of 50 feet. It serves as a tributary to Hardy Spring Brook.

Carr Pond is shared between Hopkinton and the Town of Henniker. This 11 acre pond has an average depth of five feet.

Grassey Pond is also shared between the Towns of Hopkinton and Henniker; although it is owned by the New Hampshire Department of Fish and Game. It is a marshy pond 20 acres in size that is located to the west of Clement Pond.

Rolf Pond is 30 acres in size and lies southeast of Clement Pond and northwest of Carr Pond.

Rivers

The Contoocook River has been cited as Hopkinton's prime natural resource. The river originates in southwest New Hampshire and flows northeast to the Merrimack River in Concord. It enters Hopkinton from the Town of Henniker and generally flows northeast into Concord, where it joins the Merrimack in the village of Penacook. The Contoocook River is dammed in many places from its source in Rindge to Concord; one of the most notable dams is the Hopkinton-Everett Dam. Some of the larger conservation areas on the banks of the Contoocook River include the Mast Yard State Forest in Concord and Hopkinton, the Hopkinton-Everett Flood Control Reservoir in Hopkinton, the Concord City Forest and the Hopkinton Town Forest.

The Blackwater River starts in the Blackwater Pond in Andover, flows through Blackwater Bay in Salisbury and continues southward, forming part of the Blackwater Dam and Reservoir System, a Federally-owned area of approximately 3,500 acres in Salisbury and Webster established for flood control. The river flows through Webster past the Mock Memorial Forest, Pearson Park, and the Riverdale Sanctuary. In addition, a number of conservation easements front the river. It then flows to Hopkinton, where it empties into the Contoocook River.

The Warner River originates from Lake Massasecum in Bradford and Lake Todd in Newbury. It flows east out of Bradford and into Warner, where most of its watershed lies. It flows southeast through Warner, into Webster for a short distance, before flowing into Hopkinton, where it drains into the Contoocook River. There are no major conservation areas along the Warner River besides a few small conservation easements in Warner and small portions of the watershed that are protected in the Mink Hills and on Mt. Kearsarge.

A headwater area of the Turkey River Basin lies in the southeast corner of Hopkinton and is fed by several small brooks located within the Town.

Brooks

Dolf Brook flows from Kimball Lake, Kimball Pond, and Smith Pond to the Contoocook River. This Brook serves as a Town swimming beach.

Hardy Spring Brook flows from Clement Pond to the Contoocook River.

One Stack Brook starts at the Chase Sanctuary, west of Jewett Road, and flows into Bela Brook in the Town of Bow.

Boutwell Mill Brook starts at Whittier Pond and flows into Bela Brook in the Town of Bow.

Browns Brook starts near the Warner Town line, west of I-89, and flows into the Warner River.

Deer Meadow Brook flows out of Pillsbury Lake in Webster and joins the Contoocook River in the northeast part of Hopkinton.

Smith Pond Bog is a glacial pothole pond and is a stream tributary of Dolf Brook. It is part of the New Hampshire Audubon Society's 59 acre Smith Pond Bog Preserve. True bogs have no stream inlet or outlet, yet this bog has a small outlet stream under NH 202/9, west of Hopkinton Village.

Other than those bodies of water in the Hopkinton-Everett Reservoir area (8,000 acres of Federally owned land), most of the other lakes and ponds are under private ownership. Many of the public ponds and lakes are limited to various forms of recreation due to the type of substrate, excess of vegetation, excess pollution, lack of public access, and size. See the **Surface Water, Aquifers, Wetlands, and Drinking Water Map** for more information.

Buffers adjacent to shoreland and wetlands reduce the adverse effects of human activities on these resources by protecting water quality, protecting and providing wildlife habitat, reducing direct human disturbance, and maintaining aesthetic qualities and potential recreational value. The loss of buffers through variances/waivers and through illegal activities should be minimized.

The transport of sediments, pollutants, and nutrients associated with stormwater runoff is the largest contributor to non-point source pollution in New Hampshire. The Center for Watershed Protection, in Maryland, indicates that watersheds with less than 10%-15% impervious coverage do not experience adverse water quality and biological impacts, while watersheds with greater than 15% impervious coverage tend to show higher degrees of impairment and degradation, due to runoff.

Although Hopkinton residents are very conservation minded, as revealed in repeated surveys, it is evident that more public education is needed to raise awareness of the sensitivity of our waters and importance of careful land management. This is especially critical because landowner

education, understanding, support, and cooperation will be much more effective than the enforcement of misunderstood or unsupported regulations. In addition, a well-educated constituency advocating the appropriate development of shorelands will more likely support and adhere to the regulations made by Town decision makers.

The Town has an obligation to protect water quality, including freshwater resources used for public drinking water and as habitat for various forms of wildlife. Conservation efforts in the past have helped to protect all these resource values through the Town's Ordinances and through the acquisition of conservation land or easements. Because of these factors, it is important for the Town to take proactive steps to ensure that the quality and aesthetic value of our surface water resources are protected, enhanced, and valued.

Recommendations:

- Work with landowners to find solutions for the areas along waterbodies that are experiencing problems with septic system discharge into those bodies of water.
- Initiate a public education campaign regarding the proper maintenance of septic systems.
- Investigate the possibility of creating or expanding the public sewer system into existing areas with marginal leachfield capacity.
- Ensure that septic systems and the Hopkinton wastewater treatment plant are efficiently operated and properly managed to minimize any and all adverse effects on the water quality.
- The Town should provide for comprehensive protection of the wetlands and shoreland through regulatory, educational, and voluntary efforts.
- Facilitate the distribution of information for waterfront and wetland property owners to encourage voluntary protection and also conduct a workshop for local realtors so that they may help educate and set appropriate expectations for new property owners. Such information should contain all applicable local, State, and Federal laws and regulations and should be given to all waterfront and wetland property owners requiring a building permit.
- Realtors and Town staff should encourage new landowners to understand the importance of protecting their shoreland, setting houses back from water bodies, retaining vegetative screening, and preserving natural buffers along the water for wildlife.
- The Wetlands Conservation Overlay Ordinance should be revised to incorporate, as a minimum, protections afforded at the State level in NH RSA 483:B. The Wetlands Ordinance should be revised to require the use of the new site specific standards from the Society of Soil Scientists of Northern New England (SSSNNE). Based on scientific justification, additional levels of protection through the Wetland Ordinance should be considered to address the specific resources found in Hopkinton. The careful and strict enforcement of the Wetlands Ordinance should be a high priority for the Town.
- The Town of Hopkinton should update its ordinances and regulations to adequately address the issues of stormwater management, erosion, and sediment control to improve the quality of the Town's waterbodies.
- When updating the Town's current ordinances with respect to wetland buffers, the criteria established in the NHDES publication *Buffers for Wetlands and Surface Waters: A Guidebook for New Hampshire Municipalities*, as well as the publication by the New Hampshire Department of Resource and Economic Development (NHDRED) *Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire* should be used as a primary reference.

- Requirements for erosion and sediment control plans and stormwater management plans for projects that involve the disturbance of more than 1 acre of land and that will create more than 15% of impervious surface cover should be incorporated into the Site Plan and Subdivision Regulations. These plans should be put in place for those areas that drain directly into a primary waterbody for the Town. The Best Management Practices handbooks and model ordinances prepared by the New Hampshire Association of Conservation Districts and NH DES can be used as a guide.
- Targeted improvements to the Town's stormwater discharge and retention ponds should be made to ensure that stormwater is being efficiently and properly handled. Discharges change the ecology of the wetland/watershed/receiving stream and should be taken into account during any development proposal reviews that would increase the amount of stormwater created.
- Public awareness should be raised regarding the importance of water bodies in the Town and ways to protect them. Volunteer watershed/waterbody advocacy groups should be encouraged to work with landowners and monitor water quality.
- Track both the positive and negative impacts that the flood control structures in Town have on the natural environment, with particular emphasis placed on an ecosystem/watershed-wide approach.
- Educate the Zoning Board of Adjustment, Conservation Commission, Planning Board, and developers about the negative local impacts caused by continual incremental variances, special exceptions, and waivers to wetland and water protection ordinances/regulations. This education program should also include information about how the laws and ordinances are constructed and enforced, as well as information about the reasons and justification for the water protection measures that are in place.

Wetlands

Wetlands are natural resources which provide considerable development constraints. Wetlands pose development restrictions due to poor drainage, high water tables, slow percolation rates for septic systems, unstable conditions for foundations, and susceptibility to flooding. Wetlands are typically defined by three parameters: drainage, soil type, and vegetation. The National Wetlands inventory defines wetlands by hydrology, hydric soils, and vegetation, including trees and plants that dominate wetland areas and require wet conditions to grow.

The definition in the New Hampshire Code of Administrative Rules for the State of New Hampshire Wetlands Board for Wt 101.01 Freshwater Wetlands is: "Freshwater wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

Wetlands are also defined as poorly or very poorly drained soils by the Natural Resources Conservation Service. Very poorly drained soils have a layer of muck or peat overlaying mineral material such as sand, silt, and clay. The thickness of the muck or peat may vary depending on the soil forming process. The soil series and land types commonly associated with very poorly drained soils include marshy (Mh), Mixed Alluvial (Mn), Muck and Peat (MU), Saco (Sa) and Scarborough (Sc). Poorly drained soils are slightly better drained due to a thinner layer of muck or peat and include the following soils - Augres (AgA, AgB, AuB), Rumney (Ru), Limerick Variant (Lm), Ridgebury (RdA, RdB, RbA, RdB).

Out of the total land acreage in Hopkinton (28,416 acres), 16.5% is comprised of hydric soils, as can be seen in the chart below.

Hydric Soils	Acreage	Total % of Town
Poorly Drained	2,506	8.8
Very Poorly Drained-organic base	1,383	4.8
Very Poorly Drained-mineral base	650	2.2
Marsh	200	.7
Totals	4,739	16.5

Source: 1998 Natural, Cultural, and Historic Resources Inventory of the CNHRPC Region

Wetlands have been viewed in the past as areas with little economic value and have been subjected to filling, draining, and dumping with little regard for the consequences. In recent times, however, science has shown that wetlands provide a number of benefits to the community. Wetlands serve seven purposes: flood control, water storage and ground water recharge, erosion and sedimentation control, pollution filtration, wildlife habitat, education and recreation, and environmental health and diversity.

Flood Control

Because of wetland soils and vegetation, wetlands act as a giant sponge during periods of high run-off or flooding and then release this stored water slowly during drier periods. Therefore, flood levels are lowered during heavy rains and levels are maintained during drier months. Wetlands often absorb water that would otherwise run directly downstream and cause increased flooding and property damage. However, wetlands may vary in their flood control and water storage.

Water Storage and Groundwater Recharge

The water absorbed in the wetlands can move up by means of evaporation, laterally by flowing in streams, and downwards, thus recharging groundwater. All three movements may occur simultaneously, but one movement may dominate over the others depending generally on the season and such factors as rate of evaporation and plant uptake. Wetlands underlain by stratified sand and gravel will have the highest yielding wells. Water will percolate down through the sand and gravel more than glacial till and will recharge ground water supplies.

Erosion and Sediment Control

Because wetlands absorb and slow down the rate of runoff, the water's erosive powers are lowered. Dense vegetation also acts as natural catches for any eroded materials. However, the general cause of erosion control is the reduced rate of runoff.

Pollution Filtration

Wetland vegetation absorbs pollutants such as organic material, bacteria, nitrates, and phosphates found in water. Nitrates are converted to atmospheric nitrogen or into plant nutrients. Phosphates are used in plant tissue. However, not all pollutants are absorbed by vegetation. In addition, wetland vegetation has a limited absorption ability and should not be overloaded with pollutants, as high levels of pollutants present numerous severe health hazards and can render such areas useless.

Habitat

Wetlands offer a wide variety of vegetation. The diversification of vegetation, therefore, consists of many producers in natural food chains and provide food for numerous animal species. The wetlands vegetation and water provides food, habitats, and breeding grounds for a wide variety of wildlife and fish.

Education and Recreation

Wetlands provide natural areas of study for all ages as they offer innumerable flora, fauna, and wildlife habitat. Also, wetlands provide excellent opportunities to study successional patterns and the effect of pollution or land use. Wetlands often represent the only remaining natural lands left in a town and serve as excellent sites for photography, canoeing, snow-shoeing, hiking, fishing, and hunting.

Environmental Health and Diversity

Generally, only wetland plants can tolerate the high levels of water and only certain types of animals and wildlife can tolerate such an environment. Because the wetlands offer a diversity of vegetation and animal life, they create a more stable environment in the surrounding area.

Hopkinton has a significant number of wetlands. Large wetland systems that provide significant water quality and wildlife benefits can be found throughout the Town. See the **Surface Water, Aquifers, Wetlands, and Drinking Water Map** for more information. Wetlands have a multitude of values that include flood control, wildlife habitat, fish habitat, pollutant removal, recreation, groundwater protection, and stabilization and erosion control. The primary impacts facing wetlands in Hopkinton today are the effects of development within their buffers or within the wetlands themselves.

Recommendations:

- The Town should identify wetlands for protection and/or acquisition because of their ecological importance, unique nature, and/or because of their location in the Town.
- Maintain the variety and large quantity of wetlands in Hopkinton and ensure that wetlands retain their functional values. The Town should provide for comprehensive protection of the wetlands through regulatory, educational, and voluntary efforts.
- During any construction or reconstruction of roadways within Town, the Town should encourage the inclusion of detention/retention ponds and/or berms to gather runoff from the road surface. This would allow easier clean-up of hazardous spills and reduce salt and other sediments from entering the neighboring wetlands.
- When evaluating development proposals that affect wetlands, the entire wetland ecosystem should be considered instead of the particular acres of wetland being impacted. This includes determining the extent of habitat fragmentation and isolation, the impacts on adjacent upland habitats, the effects of stormwater runoff, and the availability of buffer zones.
- Identify critical habitats, including large blocks of undeveloped land, travel corridors, or other areas of value as determined by the wetland ecosystem and initiate efforts to protect those areas.

Drinking Water and Aquifer Protection

Groundwater is an important, limited resource commonly used for domestic and municipal water supplies. It is defined as the subsurface water, which saturates sand, gravel and other soil deposits, and fills the cracks within the underlying bedrock. The top surface of this saturated zone is called the water table, which may be just below the surface or at some depth. In some locations, such as kettle hole ponds, the visible surface of the water may reflect the level of the groundwater surrounding the pond.

The groundwater is replenished largely by rainwater and snow melt, which percolate downward through the unsaturated soil. Some replenishment, or recharge, may occur from streams, lakes and ponds. In Hopkinton, groundwater flows to streams, ponds, and lakes and then becomes part of the surface water runoff.

Although rainfall will percolate into all soil and weathered rock surfaces to some extent, areas of more porous sand and gravel will allow much greater amount of infiltration, and are specifically noted as "recharge zones" to signify their greater importance in recharging groundwater reservoirs. It is, therefore, important to identify and protect these areas from certain land uses that may pose a significant threat of subsurface contamination.

Aquifers serve three essential functions: filters, transmitting devices, and reservoirs. Impurities are filtered out of the water as it passes throughout the soil and rock. Suspended material is filtered out by surface soil and as groundwater moves through the aquifer, other impurities are removed by numerous processes. Aquifers transmit water to and from surface lakes, streams, and wetlands through subsurface locations. This is important because aquifers may supply a base flow to water bodies during dry periods, in addition to acting as natural storage reservoirs for domestic, agricultural, and industrial water usage.

The most productive aquifers in New Hampshire are in the deeper deposits of sand and gravel that were deposited by glacial streams or subsequent water flow, and are located near streams or lakes, which can augment the surface recharge of rainfall and snow melt. Also important is the area, extent, and thickness of the aquifer. Most of the highly productive aquifers in New Hampshire consist of unconsolidated deposits of gravel and sand, flood plains, abandoned river beds and alluvial valleys.

Because aquifers are such a valuable natural resource, they should be protected. Extensive filling or emplacement of abutments, retaining walls, etc. may obstruct groundwater flow, raise the water table and affect recharge characteristics. Extensive highway cuts, and the increase in impervious surface, may divide aquifers, destroying shallow water supplies, or allow groundwater to flow out along the excavation thus creating even lower water tables, reduced volumes of stored water, and a decline in well yield.

Many aquifers are recharged from streams and other surface water bodies. If these areas are covered by development and impervious material, then recharge of the underlying aquifers would be prevented. The surface of the soil would be physically sealed by various materials such as asphalt or cement, which would not allow any water to permeate the substance. Not only would the aquifer's ability to yield stored water be impaired; there would most likely be increased surface runoff and, therefore, an increased possibility of flooding.

Those areas with the highest water quality and quantity should have the least development, whether they are residential or industrial. Therefore, where the best groundwater recharge areas

and aquifer areas exist, the least development is desired, and correspondingly, where the least potential for aquifer recharge exists, the more desirable and suitable the area for development, if there are no other development concerns.

There are two public water districts that serve the Town of Hopkinton: the Hopkinton Precinct, which is supplied by a gravel-packed well off of Briar Hill Road, and the Contoocook Precinct, which relies on the 70-acre Bear Pond located in Warner. The Hopkinton Precinct services approximately 215 people with 86 hook-ups, while the Contoocook Precinct serves approximately 1,600 people with 480 hook-ups. There are a few other public water supplies within the Town that serve schools, camps and campgrounds, and other small business interests. These systems serve approximately 2,640 people with 350 hook-ups.

The remainder of the Town relies on private wells for their water supply. Between 1983 and 1997, the New Hampshire Department of Environmental Services issued 159 well permits to residents of Hopkinton, bringing the total number of private wells in the Town to 450 (NHDES Water Resources Division, 1998). As development continues to occur in areas that were once "rural" in nature, these numbers will continue to grow.

At some point, the rate of water removal from the aquifer may be equivalent to the rate of water entering the aquifer (safe yield). If greater amounts of water are withdrawn than the amounts of water flowing into the aquifer, there will be an overall lowering of the water table, which may lead to a number of undesirable consequences, such as subsidence of the ground's surface and/or entering inferior quality water. Therefore, it is important to protect and to know the safe yield and the location of large quantities of groundwater to provide alternative community water supplies, so that excessive damage to the quality and quantity of the groundwater supply or damage to the earth's surface surrounding the wells will not occur.

Because of the high necessity of clean, safe, and available drinking water for the residents of the Town, there needs to be an awareness and emphasis placed on protecting this important resource. See the **Surface Water, Aquifers, Wetlands, and Drinking Water Map** for more information.

Recommendations:

- Establish a water management system for Hopkinton.
- Carefully monitor and analyze our hydrologic balance sheet (supply and demand) in order to provide an early warning system should the Town approach the carrying capacity limit.
- Create a regional drinking water resource protection program that is adopted by all communities that share the resource. Research the possibility of creating an aquifer protection district that would provide comprehensive protection for the aquifer resource based on scientific findings, while at the same time ensuring the provisions are reasonable and enforceable.
- A regional initiative for source-water protection (aquifer and surface watersheds) should be pursued that includes partnerships with towns adjacent to Hopkinton, the Department of Environmental Services, and non-profit conservation organizations like the Society for the Protection of New Hampshire Forests and The Nature Conservancy. Measures should also be created to ensure development within the source-water protection areas is conducted in such a way that it protects the water resource.

Sand and Gravel Deposits

Large deposits of sand and gravel can be valuable sources of construction materials. Because of their permeability (the ability to allow water to flow through), sand and gravel deposits also tend to be good sites for water supply wells. Permeability also makes sand and gravel deposits very vulnerable to contamination; once contaminants are spilled or dumped, they can quickly spread. Therefore, special attention should be given to regulating land uses over sand and gravel deposits.

The Town of Hopkinton issues permits for commercial sand and gravel excavation under RSA 155E. The Planning Board also has the authority to adopt regulations that apply to gravel excavation. These regulations, along with the process of reviewing permit applications for gravel removal areas, should be designed to ensure that fuels and lubricants used by earth moving equipment are handled properly and the areas are secured against illegal dumping. The current ordinance is not based on scientific findings, nor does it require, in all cases, scientific site-specific data.

To date, little or no mining, quarrying, or crushing operations have been using the local bedrock. As society's demand for natural resources continues to increase, pressure to process the bedrock for minerals, dimension stone, aggregates, etc., could materialize. A well-planned approach to this potential needs to exist before mining, quarrying, and/or crushing operations are carried out.

There are currently two privately-owned and two publicly owned sand and gravel pits that will need to be reclaimed once all of the financially viable deposits have been removed. Reclamation means the restoring of an excavation site to a standard at least equal to those outlined in Town regulations. See the **Water Resources and Sand and Gravel Excavation Sites Map** for the locations of existing gravel pits within the Town.

Recommendations:

- Update the Excavation Ordinance to be a comprehensive, science-based set of regulations that will work to protect the water quality and environmental resources located in the Town. This ordinance not only should be imposed on the private sector, but the Town also should voluntarily comply with such an ordinance, with respect to its existing and future sand and gravel removal operations.
- As part of reclamation of the sand and gravel pits located within the Town, develop reuse plans for the sites. The spent gravel pits should be managed to their fullest and best potential, while considering environmental quality and protection.
- Any reuse of the sand and gravel pits located within the Town should be evaluated as to the appropriateness for the proposed activity, and best management practices should be used to prevent contamination of subsurface water bodies, as well as adjacent streams, ponds, rivers, or wetlands.
- An evaluation process should be undertaken by the Town, which will include an evaluation of needs, costs, and benefits of the gravel pits once they are reclaimed and prepared for reuse.
- Research the best and most appropriate approaches to bedrock mining.

Farmland

Over the years there has been a substantial change in agricultural land use. In Merrimack County in 1953, 86,900 acres were classified as agricultural, while in 1974, 63,345 acres were still agricultural, plus an addition of 102 acres of idle land went to agricultural use and 190 acres of forest land transferred to agricultural use. Thus, the net change from 1953-1974 was a loss of 23,263 acres of agricultural land use in the County. Almost seventy percent of the agricultural land change went to the idle category and thirty percent went to developed land. In 1953, Merrimack County had only 9,145 acres of developed land out of a total of 605,137 acres. In 1974, it had 25,649 acres, 7,041 of which were formerly in agricultural use.

There are 28,416 acres in the Town of Hopkinton. Like the County, there also was a decline of agricultural use with 1,213 fewer acres in 1974 than in 1953. In 1953, agriculture was represented by about 5,378 acres or 19 percent of the land use (27,965 acres), while in 1974 it was 4,165 acres or 15 percent (compared to 11 percent for Merrimack County). In general, Hopkinton had more agricultural use and less forest use than the County.

Between 1974 and 1981, there was a further loss of 1,393 acres of agricultural land, 831 acres of which became idle, 431 acres of which became developed and 131 acres of which converted to "other." Also, 19 acres of land were added to agricultural use, nine of which were forested and the balance were idle. This balance of 2,791 acres, in 1981, was identified as agricultural. As can be seen on the **Farmland, Forestland, Open Space, and Trails Map** there are approximately 2,640 acres of farmland in Hopkinton, at this time.

There are three levels of important agricultural soils: local, statewide, and prime. Soils of local importance are determined by the local National Resource Conservation Service (NRCS) district. Soils of statewide importance are lands determined by the State to be nearly prime and that economically can produce high yields of crops. Prime soils are defined at a national level as land that has the best combination of physical and chemical characteristics for sustained high yields. Unfortunately, soils that are prime for agriculture are also, for the most part, prime for septic systems and development. Thus, these soils are some of the most threatened in Hopkinton. Once the soil is developed into housing lots, driveways, parking lots, etc. it is essentially lost for agricultural purposes.

In 1981, an agricultural inventory of Hopkinton was undertaken with the Merrimack County Soil Conservation Service, the findings for three farmland categories as listed below:

Prime Farmland - 1,292 acres

Prime farmland is best suited for producing food, feed, fiber, and forage crops, and also available for several other uses. The land could be crop land, pasture land, range land, forest land or other land, but not urban built-up land or water. It has the soil quality, growing seasons, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.

Unique Farmland - 152 acres

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods.

Additional Farmland of Statewide Importance - 723 acres

Soils in this category have properties that exclude them from the prime list; however, they are important to agriculture in the State. They produce fair to good crop yields when properly treated and managed. As a general rule, erosion control and irrigation practices are necessary to produce high crop yields.

Productive farmlands include active and inactive farms located on prime agricultural soils. These lands often contain the best soils in the community and have been in agricultural use for a number of years. Hopkinton's agricultural heritage is no longer as prominent a symbol of the community as it once was; although a number of farms still remain in operation in Hopkinton. The following table lists farms in current operation.

Farms Located in the Town of Hopkinton

Name of Farm	Location	Type of Farm**	Easements
Owen Farm	Brockway Road	Livestock, agriculture	
Kimball Farm	Beech Hill Road	Hay, horticulture	Yes
Bohannon Farm	Penacook Road	Dairy	
Gould Hill Farm	Gould, Putney, and Beech Hills	Apple Orchard	
Pine Lane Farm	Contoocook Village	Dairy	
Kerins Farm	Penacook Road	Hay/corn	
Herrick Land	Burnham Intervale	Hay	
Stonynook Farm	Emerson Hill	Dairy	
M. Grady III Farm	Maple St. (W. Hopkinton)	Hay, livestock, horse	
Patenaude	Kast Hill (W. Hopkinton)	Hay	
H. Albin	Kast Hill (W. Hopkinton)	Hay	
F. Hart	Kast Hill (W. Hopkinton)	Hay	
Paul Woetzel	Sugar Hill Road	Livestock, bees	
Boulder Farm	Jewett Road	Strawberry	
Peter Holmes	Hatfield Road	Livestock, horse, hay	
Robert Wells	Hatfield Road	Livestock, pasture, hay	Yes
Robert French	Sugar Hill Road	Livestock, pasture, hay	Yes
K. Hayden	Jewett Road	Horse	
M. Shaw/R. Tomasko	Stumpfield Road	Horse	
George Evans	Stumpfield Road	Horse	
G. Brown	Upper Straw Road	Livestock	
P. Russell	Maple Street (Contoocook)	Blueberries	
M. Payson	Beech Hill Road	Hay	
A. Hogbloom	Patch Road	Horse, pasture	
W. Kimball	Hopkinton Rd (Contoocook)	Horse, pasture	
W. Chapin	Maple Street (Contoocook)	Hay/agriculture/horticulture	
C. Wetterer	Dolly Road	Horse, pasture	
C. Gentilehomme	George Road	Livestock, pasture	
L. Dursin	Hopkinton Rd., Diamond Rd.	Horticulture	
A. Pitman	Hopkinton Road	Blueberries	
Avonlea Farm	Hopkinton Road	Horticulture	
L. Ogden	Broad Cove Road	Horse	
Chip/Deede Gilroy	Hatfield Road	Horse, sheep	
Saloman Property (former)	Moran Road	Horse	
Dotty Brown	Clement Hill	Horses, Livestock	
Wee Little Farm	Kearsarge Avenue	Horses	
Sankey	Clement Hill	Goats	
Moran Heirs	Moran Road	Vegetable, truck farm	

Note: List is a partial list of farms and agricultural operations located in the Town of Hopkinton.

** This list does not include any Christmas Tree Farms located in the Town of Hopkinton.

These farms still contribute significantly to the character of the community and provide an economically beneficial use of the land, for both the Town and the landowner, and should be encouraged and supported. There have been many points of conflict regarding farming over the years that can and do occur in Hopkinton and across the State. The state has taken steps to promote farming through RSA 672:1, III-b and RSA 432:33, both of which are listed below.

RSA 672:1, III-b

Provides right-to-farm protection by stating that farming "..shall not be unreasonably limited by use of municipal planning and zoning power." Best Management Practices (BMPs) developed by agricultural and natural resource professionals address public health and safety concerns. By referring to standards of performance embodied in BMPs, Hopkinton can identify when a nuisance is occurring on a farm.

RSA 432:33

Provides that "No agricultural operation shall be found a public nuisance as a result of changed conditions in or around the locality of the agricultural operation, if such agricultural operation has been in operation for one year or more and if it was not a nuisance at the time it began operation."

The Town needs to ensure that these conflicts are minimized and that farms and farming are seen and treated as a welcome and integral part of the community.

Recommendations:

- Active farmland should be targeted for conservation and farmland easements. The NRCS Farmland Protection Program and other programs through the USDA and the State should be promoted in the farming community as a means to continue farming operations.
- New residential developments abutting existing farms may be required to meet certain criteria, such as additional buffers, setback requirements from pasture land, and other requirements that will serve to minimize impacts on both the farm and residential development.
- The Town should try to retain as much of the current farmland and prime agricultural soils in productive use as possible.
- New agricultural and livestock uses should be a permitted use in all residential zones, with clear restrictions on the agricultural/livestock uses to ensure that nuisances to the residential areas are avoided. Restrictions should include, but not be limited to, a minimum lot size established for each of the various types of agricultural and livestock uses, restrictions on the types of agricultural operations, additional setback requirements, a requirement for waste management plans, animal density restrictions, and other requirements that will serve to minimize impacts on residential neighborhoods, and yet ensure that the agricultural operations are viable.
- Hopkinton should continue to support the Current Use tax program.
- Support, through zoning and possibly annual recognition programs, the farmers in the community. The Town should also encourage agricultural operations and local farm stands, in order to promote the preservation of farms and farmland in the community.
- Work with the area farms/farmers in creating a public education campaign for local community residents focused on the environmental, societal, historical, and cultural benefits of retaining and preserving farmland in the community.
- The Planning Board should research the possibility in providing flexibility in zoning, subdivision, and site plan review regulations for agricultural uses and/or related activities.

Wildlife Habitat Management

The challenge of conserving enough habitat to support healthy native wildlife populations is complicated by the varying habitat requirements of our diverse species. Some species require less than an acre of undisturbed forest, while others need territories covering more than a thousand acres. In addition, many species require several different habitat types through the course of the year. The more habitat diversity within the Town, the more likely it will support a diverse and abundant wildlife population.

A major concern for wildlife diversity is that sprawling development patterns that cover the rural landscape cause habitat fragmentation. Wildlife that are sensitive to human encroachment are restricted to these islands of undisturbed land and they may die out if an area becomes too small. The fragmentation of wildlife habitat also causes damage and loss of native plants from overgrazing, a reduced breeding gene pool, loss of natural predators, and increased susceptibility to disease.

For optimum wildlife habitat, blocks of unfragmented land should be void of significant human activity or development. Wildlife biologists consider 250 acres as a minimum for unfragmented habitat. Hopkinton has many areas of unfragmented land greater than 250 acres in size, as can be seen on the various maps included in this Master Plan.

The size of a species' population is usually dependent on the amount of suitable habitat. Animal populations can often be manipulated by varying the amount of available habitat. However, unless a species is rare and endangered, one species should not be favored over another. Providing a variety of habitats and protecting them from development and negative environmental impacts will increase the diversity of wildlife in Hopkinton. The Town should work to prevent the loss of wildlife habitat and manage properties for wildlife conservation.

Recommendations:

- Identify and catalogue parcels of unfragmented land in the Town of Hopkinton, with a special emphasis on lands that abut other parcels of conservation land, water bodies, or established recreation areas.
- Develop a conservation development approach for the design of subdivisions and developments, particularly within those areas identified as unfragmented in Hopkinton. A conservation development approach will recognize the right and ability of a landowner to use his/her land, but minimize the fragmentation of the habitat.
- Decrease the loss of large parcels of unfragmented land in Hopkinton and encourage more property owners, including the Town, to manage their properties for wildlife habitat.
- Develop and implement a Hopkinton Wildlife Habitat Protection Program using the document published by the Non-game and Endangered Wildlife Program of the NH Fish and Game Department.
- Publicize through Town sources (e.g., Web site, newsletter, direct mailing) information to landowners about voluntary wildlife habitat conservation programs, such as the NH Coverts Project and the Wildlife Habitat Incentives Program (WHIP). Encourage the Conservation Commission to participate in these programs.
- A hands-on public education campaign to educate and promote wildlife conservation in Hopkinton should be developed.
- Map the existing wildlife corridors that are being utilized in the Town by the various forms of wildlife.

- Educate landowners as to where wildlife corridors exist and conservation and land maintenance that they can employ to help preserve and protect these areas.
- The Town should, where possible, acquire conservation easements or purchase the land where wildlife corridors exist. Special priority should be given to those corridors that connect already acquired or protected parcels of land in the Town or abutting Towns.

Species of Special Concern

The Natural Heritage Inventory (NHI) is a State program in the Division of Forest and Lands. The NHI finds, tracks, and facilitates the protection of New Hampshire's plant and animal species of concern, and exemplary natural communities. Exemplary communities are distinctive communities of forests, wetlands, grasslands, etc., that are found in few other places in New Hampshire, or are communities that are very old and in good condition. Species of concern are those species listed as threatened or endangered under the New Hampshire Endangered Species Conservation Act of 1979 or under the New Hampshire Native Plant Protection Act of 1987.

The NHI data represents the best available information for locations and status of species of concern and natural communities in New Hampshire, but there are certainly occurrences that have not yet been found since a comprehensive inventory of the State and Town has not been done.

Flag	Species or Community Name	Listed		# Locations Reported in the Last 20 Years.	
		Federal	State	Town	State
	Natural Communities - Terrestrial				
	CNE Mesic Transitional Forest on Acidic Bedrock or Till	-	-	Historical Only	22
**	Hemlock Forest	-	-	1	2
**	SNE Stream Bottom Forest	-	-	1	8
	Natural Communities - Palustrine				
*	Blackgum/Red Maple Basin Swamp	-	-	1	17
	SNE Level Bog	-	-	Historical Only	19
	Plants				
	Giant Rhododendron (Rhododendron maximum)	-	-	Historical Only	15
	Gypsywort (Lycopus rubellus)	-	-	Historical Only	1
	Wild Lupine (Lupinus perennis)	-	Threatened	Historical Only	37
	Veterbrates - Birds				
**	Great Blue Heron (rookery) (Ardea herodias)	-	-	3	37
	Purple Martin (Progne subis)	-	-	Historical Only	11
	Invertebrates - Mollusks				
**	Brook Floater (Alasmidonta varicosa)	-	Endangered	1	30

These flags are based on a combination of:

- (1) How rare the species or community is, and
- (2) How large or healthy its examples are in that town.

** Very High Importance

* High Importance

Source: Natural Heritage Inventory, July 5, 2000

Hopkinton does not have any known occurrences of Federally listed endangered or threatened species. However, there is one known State-listed endangered species found in Hopkinton and one known State-listed threatened species. In order to protect the species of concern and the rights of property owners, the NHI places an un-centered 0.75 mile buffer around known occurrences of a species, to make it more difficult to detect the exact location of the species of concern. Thus, due to the map-reporting requirements of the NHI and the number of species of concern listed for Hopkinton, a map of the known occurrence locations is not useful since the entire map essentially turns into one large "buffer circle."

As much as it makes sense to protect open space for the benefit of the species of concern living in Hopkinton, it makes just as much sense to protect open space for the great deal of other species. Such common animals as deer and beavers are important for maintaining the natural health of the community. Other carnivores and raptors help to keep the herbivores in a stable population.

Preserving open space for these "common" animals helps to maintain the habitat, and in turn, ensures the stability of the endangered and threatened species populations.

Recommendations:

- As part of the Site Plan and Subdivision Regulations submission requirements, require applicants proposing construction on undeveloped properties to contact the Natural Heritage Inventory Program to find out if species of special concern are known to be located on their property. If such species are located on the site, encourage the property owner to voluntarily work with the Natural Heritage Program to help protect them.
- A public education campaign should be carried out and/or combined with other efforts as to the presence of endangered, threatened, and/or species of special concern located within the Town of Hopkinton, and the environmental and societal benefits of such species.
- Make landowners in Hopkinton more aware of possible occurrences of sensitive species on their property to ensure that development projects are designed in such a way to protect the sensitive species.

Greenways and Trails

Greenways are corridors of protected open space managed for conservation and recreational purposes. Greenways often follow natural land or water features, and link nature reserves, open space, farms and forest land, parks, cultural features, and historic sites with each other as well as with populated areas. Some greenways are publicly owned, some are privately owned, and some are the result of public/private partnerships. Some are open to visitors, others are not. Some appeal to people, while others attract wildlife. In more developed areas, greenways can encompass natural or built features and can be managed primarily for resource conservation or recreation.

In more rural areas, greenways are natural corridors linking large unfragmented natural areas, preserving wildlife habitats and migration routes. Greenways serving as wildlife corridors can be virtually any type of traversable land, preferably of at least 200 feet in width. Common tracts of land that can be used as greenways include Class VI roads, railroad right-of-ways, and buffer areas along agricultural/forestry lands. Creating and maintaining a greenway system will help to ensure that those parcels of open space, which include forest, wetland, and agricultural lands, do not become isolated islands, detached from one another and surrounded by development.

Trails that make up the greenway system, as well as those that are located within Town forests and conservation lands, need to be maintained and expanded. Whether these trail are used for walking, bicycling, horseback riding, cross-country skiing, snow shoeing, or some other form of recreation, they help to form an important link between the natural environment and the built one by allowing people to access and enjoy nature in a low-impact manner. There are probably many "unofficial" greenway trails throughout the Town that are used by the public.

Hopkinton has six established trail systems in Town, all of them located within Town-owned forests and conservation land. These include trails in the Brockway Nature Preserve, Hawthorne Town Forest, Mast Yard State Forest and the adjoining Town Forest, around Smith Pond Bog, in the Hopkinton-Everett Flood Control area near Elm Brook Park, and the Steven's Rail Trail. These trails can be seen on the **Farmland, Forestland, Open Space, and Trails Map**. The Town

needs to take a proactive approach to officially creating this greenway system that links the Town's conservation and open space lands.

Recommendations:

- Identify existing and potential greenways that are in the Town, as well as those that are in abutting Towns that run along the Hopkinton border.
- Expand and strengthen the Hopkinton greenway system through acquisition of conservation easements on important lands through donation, purchase, or partnership with public and private conservation groups. A conservation fund should be maintained to allow the Town to qualify for matching funds, as opportunities arise.
- Investigate the use of Class VI roads and discontinued rail beds as greenway/trail/wildlife corridors that could be used to link existing open space and recreational lands.
- A priority should be given to protecting land that would link key conservation parcels that the Town already owns or has easements on for greenway creation.
- Under the authority NH RSA 236, the Town should investigate reclassifying those Class VI roads which link parcels of open space, recreation lands, agricultural lands, and forest lands to Class A trails. By reclassifying those roads, landowners with existing structures may still use the reclassified roadway to access their structures, however future development is prohibited. The Town is allowed, by law, to maintain the trail, unlike Class VI roads. Landowners can use the trail to access lands for forestry and agricultural purposes.
- Identify and map all of the "unofficial" trails that currently exist on Town-owned conservation, open space, and forest land.
- Outreach should be done to encourage private land-owners to allow Town-sponsored trails to cross their land if it would help link important pieces of the trail network.

Scenic Views

The landscape of a community defines its cultural, natural, and historical heritage and thus provides the residents of a community with a sense of identity. Hopkinton's identity is marked by the views of and from roadways and the major rivers. In addition, the areas of historical and existing agricultural operations create a pastoral landscape that helps to define the community. Hopkinton, with its hilly topography, offers numerous scenic views of rolling hills, ponds, and streams.

A scenic resource evaluation, from Vermont's "Mad River Resource Protection Plan," provides a list of key scenic attributes that transfer well to Hopkinton. These key scenic attributes include:

Physical Features

- Rivers, ponds, streams, and wetlands
- Vegetation, greenery, foliage, and wildflowers
- Elements of a working landscape, such as animals, farm buildings, crops, etc.
- Agricultural Lands
- Wildlife

Important Aspects of Views

- Diversity and contrast within a view, such as a patchwork of open and wooded land
- Location of open space adjacent to historic New England housing, hedgerows, and stonewalls, etc.
- Continuous views that “follow” you as you travel along the road or are deep views
- Lack of scattered development or other disturbances in views
- Vantage points – the point or area that provides access to the view

Hopkinton has a rich diversity of scenic views and vistas, most of which are protected only by the willingness and desires of the landowners. No comprehensive inventory or analysis exists of Hopkinton’s scenic views and vistas. As more development occurs within the Town, the scenic views, and locations to observe such views, become more endangered. See the **Steep Slopes and Scenic Vistas Map** for more information.

Recommendation:

- Critical scenic views should be identified and protected. The protection of these viewsheds through the development review process and/or cooperatively working with the landowner is recommended. In some instances, scenic easements may be warranted.

Forests

In the Town of Hopkinton, there are both publicly and privately managed forests. The publicly managed forests include the three State forests, the Hopkinton-Everett flood control area, and the thirteen Town forests. The privately owned wood lots are managed by the landowners, often with the aid of professional foresters. Many of the private wood lots are enrolled in the National Tree Farm program. Forests serve a number of functions in both the community and the region, including protecting public water supplies and watersheds, serving as a source of renewable energy, providing lumber and other forest products, enhancing wildlife habitat, providing outdoor recreational opportunities, and contributing to the rural character of the community.

There are two major forest types found within the Town of Hopkinton. The large dry, sandy outwash plains found along the Contoocook River and its tributaries tend to be dominated by white pine. The hillsides found in the remaining portions of the Town contain a mixed forest dominated by red oak, red maple, and white pine.

The Hopkinton Town Forest system contains 13 lots that total 582 acres and are found scattered throughout the Town. They range in size from 9 to 110 acres and are managed by the Hopkinton Conservation Commission. Of the 582 acres, 466 acres would be considered upland forest, with the remaining acreage consisting primarily of wetlands. Several of the forests are protected by Conservation Easements. All of the Town Forests are managed as a multiple-use resource where consideration is given to timber harvesting, recreational opportunities, wildlife habitat, watershed protection, education, and preservation.

Harvesting timber is also an important source of income to the landowner. All timber harvests, whether on public or private lands, are required to pay a timber tax to the Town’s general fund. Yearly timber tax totals have fluctuated over time but there is a general trend of increased payments as the timber becomes more valuable, along with increased enforcement regarding the Timber Tax laws. For example, a total of \$5,108 of timber tax was collected in 1976 and by 1999, the yearly total had reached \$22,576.

The Current Use Tax program is a good indication of the amount of land within the Town dedicated to conservation. In 1999, there were 12,311 acres of forest land enrolled in the Current Use Program. In 1999, there were 16 certified Tree Farms, representing 2,351 acres of privately-owned, intensively managed forest, most of which is also included in the Current Use Program. The total number of acres of dedicated conservation lands in the Town are listed in the table below and can be seen on the **Farmland, Forestland, Open Space, and Trails Map**.

Conservation and Town Forest Lands

Conservation Land	Held By	Acres
Brown/Robinson Lot	Town	14
Carriage Lane Lot	Town	1
Chase Wildlife Sanctuary	ASNH	660
Contoocook State Forest	NH DRED	28
Galloping Hills Open Space	Town	25
George's Park	Town	16
Goodwill-Chandler State Forest	NH DRED	26
Grassey Pond Marsh Dam and Row	NH F&G	1
Hopkins Green Open Space & Flowage Area	Town	16
Hopkinton-Everett Reservoir (incl. Elm Brook Park)	US Army Corps	2,820
Houston Farm	Town	68
Frank & Dorothy Kimball Easement	NH DA	178
Robert Kimball Easement	NH DA	62
Kimball Lake	Town	20
Kimball Pond Recreation Area	Town	3
Janeway Easement	Town	6
Mast Yard State Forest (Hopkinton Portion)	NH DRED	461
Meadowsend Timberlands/Robert French Easement	SPNHF	1,153
Murphy Easement	Town	13
Smith Pond Bog Wildlife Sanctuary	ASNH	61
Town of Hopkinton Land	Town	43
Town of Hopkinton Land	Town	4
Town of Hopkinton Land (Gould Forest Lot)	Town	45
Town of Hopkinton Land (French Lot)	Town	10
Town of Hopkinton Land (Aqueduct Lot)	Town	33
Town of Hopkinton Land (Contoocook River Lot)	Town	97
Town of Hopkinton Lot (Hawthorne Lot)	Town	11
Town of Hopkinton Lot (Brockway Lot)	Town	98
Town of Hopkinton Land (Burnham Intervale Lot)	Town	12
Town of Hopkinton Land (Stevens Rail Trail)	Town	27
Town of Hopkinton Land (Hardy Springs Meadow)	Town	33
Town of Hopkinton Land (I-89)	Town	6
Town of Hopkinton Land (Barton Corner Lot)	Town	28
Town of Hopkinton Land (Foote Lot)	Town	31
Town of Hopkinton Land (Townes Lot)	Town	42
Town of Hopkinton Land (Allen Lewis Lot)	Town	16
Wells Easement	Town	115
Total Acreage		6,262

Source: 1998 Natural, Cultural, and Historic Resources Inventory of the Central NH Region, CNHRPC 2000 Hopkinton Town Forest Report

Recommendations:

- When the Town Forest Management Plan is updated, the public should be involved in the process to ensure that all concerns regarding the management of the Town Forests are addressed.
- Abutters should be notified prior to the start of major forest management activities in Town Forests. The Selectmen's office should also be kept abreast of all planned activities to provide information to the public in a timely manner.
- Forest management information should be made available by the Town to private woodland owners to encourage long-term planning and consideration of all aspects of the forest ecosystem, including wildlife and watershed concerns. UNH Cooperative Extension for Merrimack County is an ideal source for forest management information.
- The Town Forest Management Plan should be updated at least every ten years in order to assess the Plan's effectiveness and adjust the management to the changing demands on the forest resource.
- The Town should strive to develop high quality, healthy forest types, whose harvest will produce sufficient incomes to cover management expenses and allow the purchase of additional conservation lands.
- Forests should provide a variety of productive habitats to maintain a diverse and healthy wildlife population and to protect critical habitat types.
- The Town should use its forests to provide residents with public land for outdoor recreational activities.

Lands Identified for Conservation

Hopkinton has a significant amount of conservation and public lands that afford various levels of conservation, preservation, and open space of the resources. In the Master Plan Survey, when asked if tax dollars should be spent on the protection and preservation of natural, cultural, and historic resources, 60% of the respondents supported that statement. Hopkinton residents value and protect the Town's natural resources, as can be seen by the figures below:

Current use acreage for the Town of Hopkinton for 1999 and 2000:

<u>Type of Acreage</u>	<u>1999</u>	<u>2000</u>
Farmland (acres)	1,991.78	1,976.56
Forest land (acres)	12,311.03	12,246.50
Unproductive Land/Wetlands (acres)	1,549.94	780.97
Total (acres)	15,852.75	15,004.03
Total Town Acreage	28,416	28,416
Acreage in Current Use	55.80%	52.80%

In its simplest definition, open space is land that has not been developed or converted to other uses. These are natural features that make Hopkinton a special place to live. They include forests, fields, river corridors, wetlands, wildlife habitat, and greenway corridors, as well as agricultural lands and town parks. These areas can be used for commercial, recreational, and relaxation activities. Analyses done for communities throughout New Hampshire consistently show that open space is a net positive tax revenue generator, versus the alternative typical housing development, which creates a net cost to the community.

One of the most important reasons to plan for open space is to set a course for the Town of coordinated development that maintains the Town's high quality of life. Many times decisions are made on land use without the benefit of a unifying plan to coordinate the actions. The result is haphazard development that disregards the Town's and/or Region's unique characteristics and sense of place.

Recommendations:

- The Town should encourage other agencies and non-profit organizations to pursue the acquisition of conservation easements or fee title to the properties.
- The Town should investigate partnering with conservation organizations, such as The Nature Conservancy and the Society for the Protection of New Hampshire's Forests, as well as others, in an effort to develop a scientific basis for specific recommendations for land acquisitions, with an emphasis directed toward greenway enhancement or water resource protection.
- Identify and prioritize potential parcels of land that the Town feels should be protected because of important cultural, ecological, historical, or recreational value.
- The Conservation Commission should establish a stewardship program to monitor all of the existing and future conservation and scenic easements held by the Town. The stewardship program should be a part of the Conservation Commission's budget and the funding required for stewardship should be evaluated for each easement under consideration by the Commission.

Strategies to Meet Conservation Goals

Current Use Tax Program

Current use is a property tax approach to encourage land owners to keep open space undeveloped. Land that is participating in the current use program is taxed on its potential to generate income in its existing, or current, use - frequently as a farm or woodlot. This is a type of preferential tax program. The alternative taxing strategy is taxing the land on its income producing potential at the most highly developed use that could take place on it, such as a housing development or commercial business venture. Land owners who have qualifying land must apply to the Town to participate in the program. Lands that typically qualify for the current use program include farm land, forest land, tree farms, certain wetlands, and other undeveloped areas.

When land that has been participating in this program is removed and is changed to a more developed use, a land use change tax is charged. The land use change tax is set at 10% of the assessed market value of the land after development.

Conservation Easement

A conservation easement is a permanent, legally binding agreement that ensures that certain uses will never be allowed on that property. Typically conservation easements prevent development of land uses such as construction, subdivision and mining, but allow uses such as agriculture, forestry, wildlife habitat, scenic views, watershed protection and education. The agreement exists between a willing land owner and a qualified recipient, which can be the Town or State governments or various conservation organizations. Each conservation easement is custom tailored to the interests of the land owner, the receiving entity and the unique

characteristics of the property. The land can be sold or deeded by the original owner and subsequent owners, but the restrictions of the easement are binding on all future owners.

Management Agreement

These management agreements are conservation easements applied to particular land uses. Each focuses on a particular open space value and a management agreement can be custom tailored to any specific situation.

Right of Way for Trails - The Town may protect open space along a recreational trail corridor area. The right of way could be arranged and exist as a legal agreement between the Town/nonprofit organization and the owner of the land where the trail is located.

Wildlife Corridors - Open space can be protected for its value in allowing wildlife to travel from one place to another safely. Working with maps indicating where certain species can be found, probable travel corridors could be recognized. Once areas are recognized, the Town could then create plans to acquire, protect, and/or manage these important corridors.

Buffers Between Uses - Buffers between incompatible land uses can ensure that development and growth within the Town does not have a negative impact on the rural and scenic qualities that the Town values.

Landowner Education

A brochure should be developed focusing on landowners with large acreage or land containing critical resources. The brochure will provide information on the advantages for the landowner and community of conserving the property and the opportunities available to conserve the land via conservation easements or sale. This brochure could be developed by the Conservation Commission.

Acquisition

Sometimes the best and simplest way to protect a key parcel of land is through outright acquisition and management. Acquisition may be through gift or purchase and ensures that the property stay in the use that the purchaser prefers.

Conservation Funds

Many towns have created separate conservation funds or open space acquisition funds specifically for the purpose of paying for land acquisition. Money for these funds may come from Town budget appropriations, land use change taxes, or proceeds from managing or selling Town property, just to name a few.

Appropriation from Town Budget - The Town can regularly set aside money for a conservation fund in their annual Town budgeting process. The Town should consider funding a capital reserve account, through the Capital Improvements Plan (CIP), to fund the acquisition of easements and conservation lands. These funds could also be used for match requirements when opportunities arise in which other agencies are funding most of the cost.

Land Use Change Tax - When a property that has been paying the lower Current Use Tax rate is removed from that program, the land use change tax penalty is paid to the Town that the property is located in. The penalty is 10% of the full market value of the land when it leaves the current use program. Many Towns put all of this money directly into the conservation fund. The town should increase the funding of the conservation account from the current level of 35% to 100% of the land-use change tax.

Proceeds from Managing or Selling Surplus Town Property - Towns that have property or resources that they manage, often can provide income to the Town, as well as the Conservation Fund. This is frequently through timber harvest operations on mature forest land owned by the Town. The proceeds from the sale of surplus Town property can also be dedicated to the Conservation Fund

"Municipal Bill Round-Up" - An additional funding source for a variety of activities, such as greenway acquisition, easement acquisition, and creating bike trails and sidewalks, is the use of a "round up" program for tax bills, utility bills, and registration fees. Under such a program, the taxpayer could voluntarily round his/her bill payment up to a designated amount above the actual bill and designate it to any of the desired programs listed.

Bond Issue

The Town may agree to borrow money for a conservation project through a municipal bond issue.

Town Surplus Funds

The Town can apply leftover funds, if they are available, from prior years' budgets to fund conservation projects.

Tax Deeds

When the Town acquires property because the owner has not paid all of the taxes on the property, the Town can keep and manage the land and include it in as part of the Towns conservation plan.

Land and Water Conservation Fund

The Land and Water Conservation Fund is a federally funded program administered through the Department of Resources and Economic Department. Eligible projects must be outdoors and can include land acquisition for conservation, open space, or the development of an active recreation area, and the expansion or rehabilitation of existing areas. Approximately \$600,000 is available each year with a cap of \$100,000 per project.

Land and Community Heritage Investment Program (LCHIP)

This State fund is designed to assist communities that want to conserve outstanding natural, historic, and cultural resources. There will be the requirement that the Towns match the State money from this fund with a 50% match from other sources, some of which can be an "in kind" match, as well as funds from other sources.

Land Trust

The Town should support non-profit land trusts that accept and pursue property and easements for land of local concern.

Grants from Foundations

The Town would need to research available grants and develop proposals to seek funding to conserve a particular piece of property or type of resource within the Town. Funding could be sought from foundations at the Local, State, Regional, and National level.

Cooperative Ventures with Private Organizations

When the interests of the Town to conserve open space match with the interests of a private organization, the potential for a cooperative partnership to protect land exists. This tactic will require some creative thinking and introductory discussions by Town officials with area organizations who have, or could develop, an interest in conserving open space.

Mitigation

For the purposes of administering sensitive areas, mitigation includes rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments.

Large Lot Forestry and Agricultural Zoning

Planning theory states that dividing developable land, or potentially developable land, into larger lots will slow development and preserve open space and rural character. The goal of these two types of zoning is to provide large enough blocks of land that they can be managed for a specific resource value. Lot sizes must be established that truly reflect the amount of land needed to allow for commercially viable use of the land and are related to the reality of the use of the land in the area.

Overlay Districts

Overlay districts can be used by communities to define and apply special regulations to a particular resource. Once resource areas of concern are identified, the planning board must establish what kind of special regulations apply to that particular resource. Some examples of overlay districts include:

Ground Water Protection Districts	Historic Districts
Forestry Districts	Agricultural Districts
Steep Slope Districts	Wetland Districts

Aesthetics Based Land Use Regulations

Because the appearance of the community, including views of simple things like tree lined streets, as well as scenic views of the mixed farm land, forests, historic buildings and water resources that largely define Hopkinton's traditional landscape, are so important to the fabric of the community, there must be a priority placed on preserving them. Planning regulations addressing lot size, placement of buildings, signage and landscaping are typically used to address aesthetic elements of the community.

Environmental Science-Based Regulations

Environmental science-based land use regulations are based directly upon measurable characteristics of the land-base of the community, rather than on possibly arbitrary standards established. Regulations based on the characteristics of the land may reflect the actual ability of the land base to handle development and are often easier to defend against legal challenges than those arbitrarily created. An example of this technique includes soil-based lot zoning.

Performance Zoning

Performance zoning is an alternative to traditional fixed zoning regulations. It allows for more latitude in adapting proposed land use changes to the desires of the community, the wishes of the developer and the characteristic of the resource base. Extra care must be taken in designing these regulations, to be sure that both the intent of the zoning and the conditions qualifications are clear to the Planning Board, developer, and residents.

Phased Growth Plan

Towns may adopt regulations to control the rate of development. In certain rapid growth situations, slowing the rate of development can be a way to retain some open space from development for a short period of time, during which it may be possible to determine if there is a need or mechanism to preserve it permanently.

Limitations on the Number of Building Permits

One way to help conserve open space, in the short-term, in a community is to establish a maximum number of new building permits that will be allowed in any given year. The number of permits allowed annually needs to be correlated in some meaningful way with the growth pressure on the community. This type of growth control strategy needs to be carefully crafted to accurately reflect the goals of the community and to avoid the perception of creating "snob zoning".

Conservation Subdivision Design

Rather than filling all available space with similar sized houses centered on uniformly sized lots, this development strategy focuses the construction in a smaller portion of the total land being developed, and provides for permanent protection of the open space not used for construction. The land selected for permanent open space protection should be designed to fulfill the open space interests of the entire community.

Summary

The primary focus of this Chapter was to identify the natural and man-made resources in Town, recognize the role they play in giving the Town of Hopkinton its character, and decide what strategies would best maintain that character. Our natural resources include soil, geologic formations, water, forests, open space, and wildlife. Our man-made resources include agricultural lands and recreational facilities, such as trails and swimming areas. Most of the Town's resources are interconnected and any change to one can and will have a significant impact on the others. As the population increases, demands on many of these resources will increase, some to the point of threatening the quality and quantity of the resource. It is the goal of this chapter to help develop a balance between development and resource protection within the Town.

Part of this balance can be accomplished through changes to the subdivision regulations. The Planning Board should request environmental impact assessments of all proposed developments to minimize the effects of development on the Town's resources. The requirement of open space dedication, as part of a subdivision proposal, should be researched by the Town as a way to help preserve and protect the natural environment. There also needs to be the recognition that many natural resources do not stop at the Town's boundaries and that a regional approach in dealing with their protection may be the preferable alternative.

Some of our natural resources are considered renewable, such as forest land, while others, like soil, are not. Appropriate measures need to be taken to prevent contamination, erosion,

depletion, and large scale overuse and misuse of those resources that are non-renewable, and even those that are considered renewable. The Town contains several bodies of water within its borders, some that start and end in Hopkinton, while others are merely passing through. Since all living things, big or small, depend on water, it is probably the most critical and vulnerable resource. Water is not only necessary in an ecological context; it is also needed for industrial, commercial, agricultural, and residential purposes. Such dependent and varying uses bring with it a chance of contaminating the very resource that we, as well as all natural systems, are so dependent on. The Town should insure, through both enforcement and public education, that proper wastewater treatment, on-site septic systems, and erosion control practices are maintained throughout the Town.

Agriculture has long played an important role in both the Town and the State of New Hampshire, as a whole. Unfortunately, traditional farming practices have been in decline for many years. This decline can be related to poor site conditions, poor market situations, development pressures, increased local controls placed on farmers, and the loss of interest among younger generations. This decline has been somewhat offset in Town with a rise in the number of small agricultural operations. It is important that the Town continues to encourage such endeavors, especially with appropriate zoning, incentives, education, and other land use ordinances.

The Town's existing open space, other than farmland, consists mainly of forests and wetlands. Hopkinton contains approximately 6,300 acres of publicly or privately owned dedicated conservation land. The majority of the remaining open space is privately owned. Most of the dedicated conservation lands are carefully managed, though there are no management requirements for privately owned land other than what are found in the Current Use regulations. Forests are one of the few renewable resources, that if managed properly, can provide forest products, wildlife habitat, watershed protection and offer tremendous aesthetic, educational, and recreational appeal. Most of the development pressure that is currently being felt by the Town is focused on privately owned open space. Because such lands are being targeted for development, it is important that the Town identify critical habitats, greenways, and corridors that should be protected through purchase, easements, or other means. These actions will help to reduce land fragmentation and help maintain the rural, cultural, and historic character that make Hopkinton the place it is today and the vision of what it wants to be tomorrow.