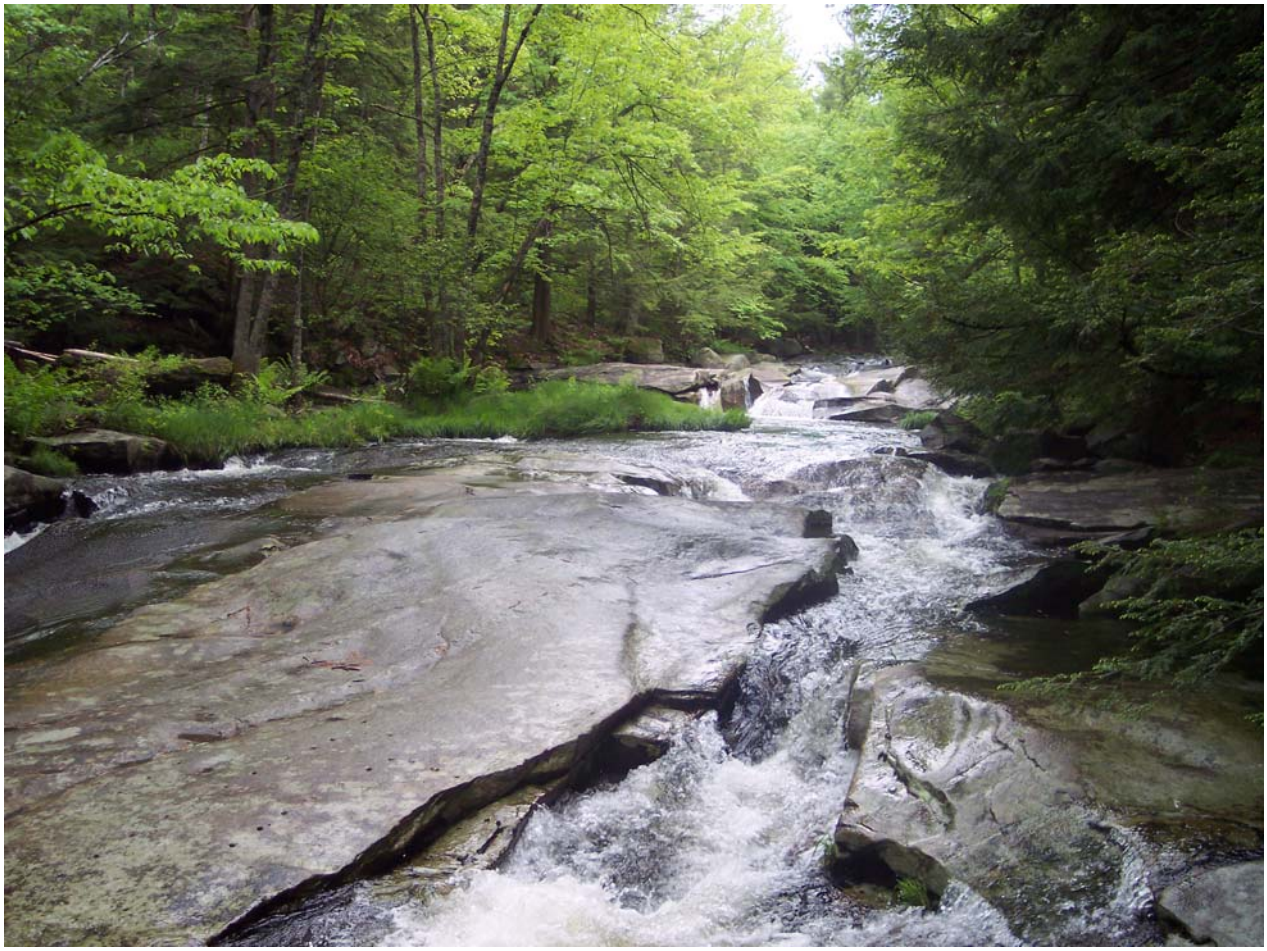
Chapter 3
Natural Resources



The Flume, Mad River

Chapter 3
Natural Resources

1.0 INTRODUCTION

Farmington is a rural community with exceptional natural resources. Significant water resources, agricultural lands, and unfragmented blocks of land support the community's health, economy, tax base, wildlife species, recreation activities, and quality of life. The type and distribution of the town's natural resource base also influences the location and type of development that takes place within the community. Some areas of the community are better suited for a particular use than others, based on the natural resources that are present there.

Agricultural Land Along _____ Road

The information provided in this chapter will allow Farmington to determine compatible future uses for certain land areas, and significant resource areas that are not currently protected. Farmington, just like natural resources, does not exist in isolation. It is hoped that this chapter will alert residents of Farmington to the importance of the natural integrity of the entire region, and their role in this natural system. At the end of each section within this chapter land use implications have been identified, and potential policy actions have been suggested. The policy actions will be incorporated into the Implementation Chapter of the Master Plan to provide a work program for the town upon completion of the Master Plan. Farmington's Natural Resource Inventory is an adjunct to the Master Plan, and contains additional detail about each of the resources outlined in this chapter.

2.0 CLIMATE

Typical of Northern New England, the primary characteristic of Farmington's climate is the ability for conditions to change very quickly. A large range of temperatures and conditions can be experienced in a single day, and are guaranteed over the course of a year. The area also experiences great differences between the same seasons from year to year. The average annual temperature in Farmington is 45 degrees Fahrenheit although it can dip well below zero for periods of time during the winter, and exceed 100 degrees Fahrenheit at times in the summer months.

During the warmer half of the year most of the precipitation comes from showers and thunderstorms. Frontal precipitation in the colder season is occasionally supplemented by

coastal "Northeasters" which can bring a strong wind and heavy snowfall, and on occasion, rain or sleet. Farmington receives an average of 36 inches of precipitation annually. The average annual snowfall amount for Farmington is 63.5 inches.

Additional climate data is available at
http://www.erh.noaa.gov/er/gyx/climate.shtml#daily_summary.

2.1 Land Use Implications

Farmington's climate has a direct impact on the landscape. Here are a few summary points to consider related to the climate in Farmington.

1) With precipitation distributed evenly throughout the year Farmington has the ability to replenish its many ponds, streams, and aquifers. This sustains the health of the surface waters and recharges groundwater reserves.

2) Seasonal changes contribute to the character of the region, and the variety of recreational and economic activities available. Air pollution from vehicles, homes, and commercial and industrial facilities threatens the character of our seasons, and the quality of our water. Recognition of the role local activities have on the global problem of climate change will help to preserve these distinct seasons and the industries and character they support.

3) Snow storage or "dumping" in sensitive areas can have a negative impact on the natural systems in Farmington.

4) Road salt use and storage can negatively impact natural resources in Farmington and beyond.

2.2 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the impact of the climate on Farmington and the land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Pursue the use of alternative fuels in town vehicles and the school bus fleet. The NH Office of Energy & Planning can guide the community through such a transition.

2) Encourage carpooling and alternative modes of transportation (biking, walking, public transportation) to reduce automobile emissions in the region.

3) Work with local industries in the region, to promote alternative modes of transportation to reduce emissions.

4) Snow removed from streets and parking areas should be stored away from wetlands and water bodies. This will allow for a higher rate of filtering out of pollutants and infiltration of water as it melts.

5) Road salt should be stored in a covered facility in accordance with the U.S. Environmental Protection Agency guidelines. Snow removed from streets and parking areas should be stored away from wetlands and water bodies. This will allow for a higher rate of filtering out of pollutants and infiltration of water as it melts.

3.0 TOPOGRAPHY

Topography describes surface features of the land in terms of shape, relief and relative positions of natural features. Topography is usually expressed as elevation (height above mean sea level) and slope (change in vertical distance over horizontal distance). Topography affects several natural processes, such as climate, drainage, erosion, wind patterns and vegetative growth, in turn affecting man's activities.

Farmington's topography is a mixture of various terrain features. Farmington is mostly rolling hills East and West of the Cocheco River valley. The highest point in Farmington is Blue Job Mountain at 1,357 feet above mean sea level. The lowest point is approximately 235 feet above mean sea level at the Farmington/Rochester Town Line on the Cocheco River. There are a number of low peaks in the Western part of town including Nubble Mountain, Hussey Mountain and Chelsey Mountain. See Map __ for additional information on Farmington's topography.

3.1 Land Use Implications

Farmington's topography plays a major role in the location and impact of future development in town. Here are a few summary points to consider related to Farmington's topography.

1) River valleys are often the easiest areas to develop, and a majority of Farmington's development exists in the Cocheco River Valley. These areas also contain all of the floodplain areas, most of the surface water bodies, and critical wetlands. Minimizing the impact of development in these areas is critical to the quality of both surface and sub-surface waters.

2) Development at higher elevations on the high ridges and lower hills in Farmington presents a different set of challenges and impacts. Without thoughtful site design, these areas can greatly impact the scenic character of the community and disrupt scenic views. Access to these areas also provides an opportunity for increased environmental impacts (erosion, increased runoff rates, longer roadways, and fragmentation of habitat to name a few).

3) The variety of topography within Farmington contributes to wildlife habitat and diversity, and recreational opportunities. Ensuring connections between these distinct areas will ensure continued biodiveristy.

3.2 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the topography in Farmington and its land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Consider a ridgeline development ordinance to limit the impact of developments at higher elevations.

2) Pursue land protection opportunities that create corridors of contiguous open space between the currently protected lands.
3) Designate topographically defined viewshed areas of high value and make open space subdivision mandatory in those areas.

4.0 SLOPE

Slope is the amount of rise or fall in feet for a given horizontal distance and is expressed in percent. A 6% slope means that for a 100-foot horizontal distance the rise or fall in height is 6 feet. The slope of the land can have a great effect on development, and percent slope can greatly impact the economic and physical feasibility of development. The steeper the slope, the more it will cost for septic systems, driveways, foundations, etc. Additionally, as the slope increases so does the potential for an increase in erosion, stormwater runoff, and nutrient movement. Poor soil conditions combined with steep slopes can present significant development constraints. See Map __ for an analysis of slope in Farmington.

Slopes in Farmington have been placed into three categories on Map __: below 15%, 15 - 25%, and greater than 25%. Generally, slopes over 25% are considered undevelopable. Slopes between 15 and 25 percent are difficult and costly to develop. Slopes under 15% are generally considered the upper limits for practical development.

4.1 Land Use Implications

Slopes within Farmington also play a major role in the location and impact of future development in town. Here are a few summary points to consider related to slopes in Farmington's.

1) The majority of Farmington is covered in slopes less than 15%, which are considered developable. This will have an effect on the future development pattern of the community because large areas of the community may be fairly easy to develop in the future. (Verify during NRI Mapping)

2) As steeper slopes are developed, costs increase for both the property owner and the community. Construction and maintenance of roads becomes more costly on steeper slopes. Problems with erosion, stormwater runoff, and non-point pollution are also increased.

4.2 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the topography in Farmington and its land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Review site plan review regulations to ensure they reinforce the Steep Slope Development Standards, and reduce the impact of development on steep slopes.

2) Farmington's regulations, relative to erosion and sediment control, should be revisited to ensure that they are following the most current "best management practices" (BMPs).

5.0 GEOLOGY

The geologic history of any area is the basis for many of its natural characteristics such as topography, groundwater systems, drainage patterns, mineral resources, and origin of the soil. New Hampshire's geologic history has formed a variety of land features and mineral resources. Plate tectonics contributed to the formation of granite bedrock. Long periods of erosion shaped the hills and mountains. Most recently, repeated glacial activity provided some finishing touches to a land that had been evolving for perhaps 400 million years. Current landscape features remind us of this rich geologic history. Ring dykes indicate past volcanic activity, fault lines demonstrate where land was uplifted by tremendous forces, and eskers, drumlins, kettlehholes, and many other features are evidence of glaciation.

Bedrock Geology

As the name implies, bedrock geology is concerned with the underlying rock or ledge. Formed hundreds of millions of years ago, Farmington's bedrock is composed mostly of igneous rocks such as granite, and metamorphic rock such as schist. The metamorphic rock was formed under heat and pressure from many layers of mud, sand, and silt. It was later uplifted by the earth's internal forces.

Surficial Geology

Surficial geology includes all of the deposits above bedrock. The surface layer of weathered material (i.e. soil) is not included in the study of surficial geology (for information on soils in Farmington see Section 6 of this chapter). Surface deposits are unconsolidated, loose conglomerations of rock fragments. These surface deposits in Farmington are the result of glaciation. As the glaciers advanced the bedrock was scraped and gouged, and this material was picked up and carried along in the glacial ice. This glacial advance, or scraping, did not drastically alter the topography of the area. The profiles of the mountains appear much as they did before the Ice Age. However, the glaciers did have an impact on the valleys.

As the climate warmed and the ice retreated, it deposited two major types of material—till and glacial outwash deposits. Till is composed of a mixture of soil and rock fragments that were scoured loose by the moving ice, carried for a distance, and then deposited directly as the melting

ice released its unsorted contents. It is generally highly compacted and contains many large angular stones and boulders. Glacial melt waters also deposited material, but the moving waters actually sorted the material and deposited like sizes together along glacial streams or in glacial pools and lakes. These are outwash deposits. They are the stratified sand and gravel deposits that line the rivers. Outwash deposits are important economically for mining purposes, but they also serve as major groundwater-recharge areas. An example of this is the large stratified drift aquifer that exists under the Cocheco River. Glacial drumlins and eskers are common in this part of the state, giving this region its rolling topography. Much of Farmington's gravel features have been mined. Although some mining of sand and gravel continues today in Farmington, many other communities have seen mineral mining firms turning their interest to stone assets, and as a result seeking permits for blasting to create aggregate.

5.1 Land Use Implications

Farmington's geology has an effect on land use decisions and impacts future development in the community. Here are a few summary points to consider related to the geology in Farmington .

1) The use of outwash deposits in commercial sand and gravel operations could alter the performance of these areas as groundwater recharge areas. As material is removed and the geology is altered, water will not be filtered and stored in the same manner. This could result either in a reduction in the amount of water available to future generations, or its quality as less filtering is available.

2) It is important to carefully regulate the type and intensity of future uses wishing to locate on previously mined sites. This is due to the increased potential to negatively impact the ground water resources below.

3) The impacts of sand and gravel operations are often cited as concerns. Increased truck traffic, noise, erosion, and airborne particles can create problems for abutters, and should be mitigated.

5.2 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the geology in Farmington and its land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan

1) The Town should revisit the Earth Excavation Regulations to ensure they protect natural resources more effectively.

6.0 SOILS

Soil is the portion of the surface of the earth that supports plants, animals, and humans. There are over 1,000 different soils in the Northeast with 74 of them represented in Farmington. Soils information is an intricate part of a natural resources analysis because it provides a wealth of data concerning the capability of land to support various land uses. Soils differ from one another in their physical, chemical and biological properties. Soil properties which affect its capacity to

support development include depth, permeability, wetness, slope, susceptibility to erosion, flood hazard, stoniness, among others.

6.1 The Soil Survey

Soil scientists from the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) have collected soil information for Farmington. As they walked the land, they regularly sampled the soil to depths of 40 inches or more, and each soil was examined for characteristics such as color, texture, structure, etc. From this information, lines were drawn on aerial photographs outlining the boundaries of the different soils. Numbers were placed within each mapping unit to identify the type of soil found.

One important note in using a soils map is that changes from one soil to another are not usually abrupt, but are gradual. Thus, the line on the map represents a transition zone rather than an absolute boundary. Because of the scale of the map, mapping units are not 100% accurate. On-site soil investigations are necessary for determining exact soil boundaries.

Two publications that provide more detailed information about soils in Farmington are *Soil Potential Ratings for Development* dated July 1987 and written by the Strafford County Conservation District, and the *Soil Survey of Strafford County, New Hampshire* published by the Soil Conservation Service in March 1973.

Soil Condition Groups

The 74 soil mapping unit soils found in Farmington can be broken down into 7 natural categories or groups:

<u>Group 1-Wetland Soils</u>

These are poorly and very poorly drained soils that are wet most of the year. The water table is at or near the surface 7 to 12 months of the year. See Section 7 *Wetlands* for more information.

<u>Group 2-Seasonally-Wet Soils</u>

Included in this group are moderately well-drained soils that have a water table 1 to 1 ½ feet below the ground and where the soil is wet from late fall to late spring.

<u>Group 3-Floodplain Soils</u>

These soils are subject to periodic flooding. Their formation has been the result of sediment deposited from past floodwaters.

<u>Group 4-Sand and Gravelly Soils</u>

These well drained to excessively well-drained soils are formed in sand and gravel deposits. This group often has economic value and is found within aquifer areas.

<u>Group 5-Shallow to Bedrock Soils</u>

These soils have formed on a thin layer of glacial till which is underlain by bedrock. Steep slopes with exposed bedrock are common in some of these soils.

Group 6-Compact Till Soils
The soils in this group are well drained and have formed in compact glacial till. A hardpan layer is generally found about 2-3 feet below the ground surface. Water moves down-slope on these soils over the hardpan layer and comes to the surface as seep spots.

Group 7-Deep Loose Till Soils
This group consists of well-drained sands or loamy soils that have formed in glacial till. The water table is commonly more than four feet below the ground and bedrock is more than 5 feet below the surface. The soils contain many angular stones of varying sizes.

6.2 Important Farmland Soils

The NRCS has identified a subset of the soils in Strafford County that are best suited for farming. Prime farmland soils are those soils that the NRCS has determined will produce the highest yields at the lowest cost. According to NRCS, prime farmland soil:

"....has the best combination of physical and chemical characteristics for food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.
In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood or are protected from flooding."

In addition to prime farmlands, the NRCS has designated Farmland Soils of Statewide Importance and Farmland Soils of Local Importance. Farmland Soils of Statewide Importance are defined as:

"...land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable."

Farmland Soils of Local Importance are defined as:

"...additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned."

The characteristics of prime farmland make it particularly susceptible to development pressures. While the cost of producing a crop is low, so is the cost of developing these soils for residential or other nonagricultural uses. The need to conserve this soil resource is critical to the future of agriculture in Farmington. The economic viability of farming large contiguous tracts of prime farmland soils is degraded when these tracts are fragmented by development. Farming is recognized as an important part
of the local and regional economy as well as part of the heritage of Farmington. Map __ identifies the important farmland soils in Farmington and their current use. See section 10 for a discussion of the importance of retaining the option to raise local produce

6.3 Land Capability and Lot Size

Each soil-mapping unit found in New Hampshire has been rated for its ability to support a residential or commercial lot, based on a formula that has water quality as its primary concern. Potential pollution sources considered were septic systems, lawns, and impermeable surfaces. The assessment of suitability was based on a report by the NHDES entitled "Environmental Planning For Onsite Wastewater Treatment in NH". The formula, which uses nitrogen loading as its benchmark for pollution, was applied to each soil type and a minimum soil based lot size was determined for each mapping unit. Lots on the best soils that are capable of utilizing the most nutrients onsite, require a 35,500 square foot lot, which is the minimum. As the soils decrease in their ability to utilize nitrogen, the lot sizes increase.

6.4 Land Use Implications

The soils within Farmington play a major role in the location and impact of future development in the community. Here are a few summary points to consider related to soils in Farmington.

1) Soil characteristics such as depth, permeability, wetness, and slope can be used to evaluate land to determine development suitability and dwelling unit densities.

2) Locating new development in areas without water and sewer infrastructure requires taking a much closer look at the ability of the soils on the lot to handle a well and septic system discharge. Soil information should be used as a determinant of what constitutes an environmentally sound building lot to prevent degradation of the environment and negative impacts on abutting property owners.

3) Farmland soils are a precious resource with great value to the community and the region. See Section 10 in this Chapter for additional information on this resource.

6.5 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the soils in Farmington and their land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Base lot sizes in the rural areas of town (not served by water and sewer) on land capability. A flexible, soil based lot-size regulation should be adopted.

2) Evaluate future sewer and water line extensions on the land capability of the area being included and the desired development pattern for the community.

3) Maintain and encourage the use of the Open Space - Cluster Development Regulation that facilitates the protection of valuable farm and forest soils existing on the site by clustering the structures on other portions of the property that are more appropriate for development.

7.0 WETLANDS

One of the most important, environmentally-sensitive natural resources in Farmington are wetlands. Farmington has been making progress toward the protection of its important wetland resources. The Town recently completed an inventory and analysis of the existing wetlands resources in conjunction with Moose Mountain Regional Greenways. The foresight to protect Farmington's wetlands now will help insure clean groundwater, ponds, and streams, and a more balanced natural system in the future. Wetlands, as defined by the EPA, the Army Corp of Engineers, and the NH DES are:

Wetland Area Below Blue Job Mountain

> *"those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."*

There are many reasons why wetlands are valuable to the community. Some of those reasons are flood control, erosion control, pollution filtration, water supply, wildlife habitat, environmental health and diversity, recreation, and aesthetics. These are but a few of the important functions wetlands perform in helping protect the quality of water, land, and the community.

Wetlands perform all of these functions with no charge to society. Dams, tertiary sewage treatment plants, water purification plants, dikes, and other sophisticated and expensive man-made water control measures all try to copy what wetlands do naturally. Each acre of existing wetland provides significant benefits to Farmington.

7.1 Wetland Delineation

Wetlands are difficult to define and delineate. Words such as swamp, bog, marsh, lowland, and floodplain are often used, but are confusing and overlapping. In New Hampshire, the yearly water cycle causes tremendous variation in the level of water in the particular area. During the spring, an area might have two feet of water on its surface while that same area in September

may not have water on its surface at all. Any definition of wetlands must take this variation in water levels into account, and any delineation of wetlands requires the identification of the wetland-non wetland boundary on the landscape. For the purpose of this master plan, wetlands are defined as poorly and very poorly drained soils.

7.2 Wetland Soil Survey

A soil survey is a map on which the natural soil is identified and its distribution delineated. Boundaries of individual soils are plotted on aerial photographs after a soil scientist has traversed the land digging test holes in order to identify the soil, as discussed in Section 6 of this chapter. However, a few comments on soil drainage are necessary here.

One of the characteristics soil scientists use to differentiate soil is drainage. Drainage is broken into five categories:

1. Excessively well drained – water is removed from the soil very rapidly.
2. Well drained – water is removed from the soil readily, but not rapidly. The depth to seasonal high water table is generally more than 3 feet.
3. Moderately well drained – water is removed from the soil somewhat slowly. The water table is generally within 3 feet of the ground surface for 3 months of the year.
4. Poorly drained – water is removed from the soils so slowly that the water table is at or near the surface 7 to 9 months of the year.
5. Very poorly drained – water is removed from the soils so slowly that the water table remains at or on the ground surface more than 9 months of the year.

Very poorly drained soils have a layer of muck, or peat, that overlies the mineral soil material (sand, silt, or clay). The layer of organic matter could range in thickness from a few inches to several feet, depending on the soil forming processes. Poorly drained soils are relatively better drained so they have only a very thin layer of muck and peat, if any at all.

Map __ shows Farmington's significant wetland resources. In Farmington there are an estimated __ different wetlands, larger than 3 acres in size, which have been identified. A wetland is defined as a contiguous area of poorly or very poorly drained soils. Poorly drained soils occupy 11.6% of the community, and very poorly drained soils occupy 3.65%. Wetlands cover 17.58% of Farmington's total land area. Table 3-1 below provides additional data related to Farmington's wetland resources.

Table 3-1 Farmington Wetlands

Wetland Predictor Type	Acres	% of Town	% of Wetlands
Very Poorly Drained (Hydric A)	863.4	3.7 %	20.8 %
Poorly Drained (Hydric B)	2757.4	11.7 %	66.3 %
National Wetlands Inventory Predicted	1267.6	5.4%	30.5 %
Total of areas of NWI and all Hydric soils (intersection)	732.3	3.1 %	17.6 %
Total of areas of Hydric *or* NWI-predicted wetlands	4156.1	17.6 %	100.00 %

(Total town land area = 23639.880 acres)

7.3 Prime Wetlands

The State of New Hampshire allows communities to designate "Prime Wetlands." This designation means that the NH Wetlands Bureau, when receiving applications for dredging or filling wetlands, will apply an extra layer of rules defined by state law to applications involving wetlands designated by the town as "prime." The first step in the designation process is an inventory and assessment of the town's wetlands using the "NH Method."

Submitting wetlands to the NH Wetlands Bureau for Prime Wetland status requires preparing a map of the wetland area, a vote at a town meeting, and submitting a prime wetlands application to the NH Wetlands Bureau for approval. Farmington has no Prime Wetlands designated at this time, but the recent wetlands study conducted by Moose Mountains Regional Greenway contains all the mapping and support needed to file for Prime Wetlands designation.

7.4 Wetland Permitting

Projects which impact wetlands in Farmington are regulated by federal, state, and local regulations. The most comprehensive regulatory program is that of the NH Wetlands Bureau (NHWB). NH RSA 482-A authorizes the Department of Environmental Services (DES) to protect the State's wetlands and surface waters by requiring a permit for dredging, filling or construction of structures in wetlands or other waters of the state. RSA-482-A and the rules promulgated under that law require that projects be designed to avoid and minimize impacts to wetlands and other state jurisdictional areas. The impacts that are proposed must be only those that are unavoidable. It is the responsibility of the applicant to document these considerations in the application for a permit.

According to DES rules, each project that requires a wetlands permit is classified in one of three categories according to the type and potential square footage impact of the project – minimum, minor, or major. Many projects qualify for processing with the Minimum Impact Expedited application which may include repair and maintenance of a dock, installation of a culvert for driveway access to a single family house, or maintenance dredging of an existing pond.

Another type of project common to New Hampshire is wetland impacts due to logging. These projects are permitted through a notification process that must be filed at the same time as the "Intent To Cut" forms provided the operation is conducted in accordance with the publication, "Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire."

Historically, Farmington has had a poor record of wetland protection. Many wetlands have been illegally dredged for peat or to make topsoil, and others have been filled for construction or other land-uses incompatible with wet soils. These actions are slowly eroding the lands' ability to filter toxins, support important wildlife, absorb high flood waters, and allow gradual recharging of underlying aquifers.

The Farmington Zoning Ordinance adopted March 13, 2001 contains a Wetlands Conservation Overlay District which is defined by three wetland classes that are based on certain criteria and review standards.

Class One, Two and Three wetlands are defined. The Zoning Ordinance empowers the conservation commission to redesignate any wetland with proper hearings.

- Class One Wetlands are those that have exceptional qualities and are worthy of the greatest degree of local protection, and are eligible for up to 100 foot protective buffer

- Class Two wetlands are eligible for up to 50 foot wide protective buffers. In the Farmington NRI Wetlands and Hydric Soils Map, all NWI wetlands shown and adjacent hydric soil predicted wetlands qualify as Class Two wetlands

- Class Three wetlands are all wetlands that are not Class One or Class Two.

It is important to note that designation of wetlands as Class One wetlands, Class Two wetlands, or Prime Wetlands does not automatically apply additional local protection; the Commission must designate buffers of up to the limits allowed by the zoning ordinance.

Because there are no Class One wetlands designated in Farmington as of this writing, only Class Two wetlands have any protection by zoning ordinance. The buffer is fifty feet for those wetlands that meet Class Two criteria.

Since 2000, 16 of the projects in Farmington impacting wetlands were forestry notification projects, and required no permit. All other projects required permits for which comments may be submitted to the Wetlands Bureau when deemed necessary by the Conservation Commission. In the case of projects impacting more than 10,000 square feet of wetland, applicants are now asked to propose mitigation to offset wetland loss. Mitigation can be through creating or restoring wetlands or protection of an upland buffer by conservation easement.

7.5 Land Use Implications

The wetland resources within Farmington play a major role in the location and impact of future development in the community. Here are a few summary points to consider related to wetlands in Farmington.

1) The health of Farmington's wetlands is critical to the function of natural systems within the community.

2) It is important to point out that small wetlands (under three acres) are usually not shown on the USDA Natural Resource Conservation Service (NRCS) Soil Maps.

3) Vernal Pools don't always support wetland vegetation, but are critical breeding grounds for several species of frogs and salamanders. Small in size, they are an important resource in the life cycle of balanced ecosystems.

7.6 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the wetland areas in Farmington and their land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Farmington should pursue "Class One" local designation or Prime Wetland designation for the wetlands that qualify.

2) Consideration should be given to enacting some local protective regulations for vernal pools. This would require a commitment to fund studies, and the Conservation Commission does not currently use the conservation fund for these purposes.

8.0 WATER RESOURCES

Water is our most precious natural resource. Water moves continuously in an inter-dependent fashion known as the water cycle. All water is involved in this cyclical movement that continues indefinitely. With increased land use and human activity, the water cycle can become damaged. Humans not only take water out of the cycle (drinking water, for example), but can also put polluted water back into the cycle (such as polluted runoff). However, with good planning and conservation, plentiful clean water should be available for future uses. Farmington's water resources are utilized by residents and

Rochester Reservoir

businesses within the community, and supply a portion of the City of Rochester's water supply.

8.1 Watersheds

Surface water is precipitation that does not soak into the ground, but runs off into streams, ponds, lakes, and rivers. On the average, 1/3 of the annual precipitation in Farmington is "runoff." Watersheds are the catch basins for this runoff. Rain or snow falling within the confines of a watershed's interconnected ridge crests, or high points, eventually becomes surface and groundwater. Watersheds may be divided into subwatersheds, which may be further divided down to almost any level; even vernal pools may be said to have their own watersheds.

A watershed is usually associated with a particular waterbody that it feeds. While surface water all tends to flow to the outlet of a watershed, this is not always true of groundwater which is subject to the fissures, pressures, and soils of the surficial and bedrock geology. See Table 3-2 for Farmington's watersheds.

Watershed location is very important for a community to consider in its planning efforts. Quite often a particular watershed lies entirely within a single community, while larger watersheds almost never do. Water resources management in a community up-watershed may have a substantial impact on the water resources of a neighboring community down-watershed. The watershed approach to water resources planning is important because watersheds are the main units of surface and groundwater recharge. The size and physical character of the watershed has a large influence on the amount of water that ultimately will end up as surface water and groundwater. Land use within a watershed may be an important factor in water quality, therefore, it is very important for communities to work together in order to plan effectively for protection of water resources. Farmington has a history of surface water protection efforts in cooperation with the City of Rochester. The Watershed Protection Overlay District in Farmington is a valuable tool when applied.

Map __ and Table 3-2 summarize the __ watersheds covering Farmington. (NRI)

Table __
Farmington Watersheds

Watershed	Drains To	Extent In Farmington (acres)
1		
2		
3		
4		
5		

Source: NH Department of Environmental Services

NRI will provide

8.2 Surface Water

Major water bodies in Farmington include Baxter Lake, Rochester Reservoir, Oxbow Pond, Nubble Pond, and several unnamed bodies of water. Streams are classified by the State using the Strahler method, where the highest year round streams in a watershed are first order streams, their juncture yields a second order stream, the juncture of two second order streams yield a third order and the junction of third order streams yield a fourth order. There are no fourth order or higher rivers in Farmington, therefore none of Farmington's rivers are covered by the state statute. As such, only the major water bodies that are listed above are subject to the New Hampshire Shoreland Protection Act. Major rivers and streams in Farmington include the Cocheco, Berry's, and the Rattlesnake. Farmington's Waterfront Protection Overlay District provides standards for the regulation of development within 250 feet of all water bodies in Farmington. It is important to note that a great deal of water quality monitoring activity has been conducting by volunteers.

Stream Water Quality

There are 2 permitted outfall facilities in Farmington. See Table 3-4 in Section 9 of this chapter for additional information. After the passage of the Clean Water Act in 1971, the federal and state government spent a substantial amount of money to upgrade municipal sewage treatment plants and other point sources of pollution during the 1970's and 80's. The NH Department of Environmental Services reports that the Cocheco River, Mad River, and Rattlesnake River are all Class B water bodies. Class B designation means that these resources are swimmable and fishable surface waters.

8.3 Floodplains

Floods are a natural and normal occurrence in an area of high rainfall. During normal stream flow, water is carried in a river channel. But in times of high runoff, water rises over the banks and flows onto the floodplain. Floods only become a problem when man competes with nature for use of the land.

Areas susceptible to flooding present obvious hazards to life and property, and the continued protection of these areas from development is an important responsibility. Farmington is somewhat unique in that a large area of former floodplain in the downtown is protected by a dike built in the late 1950s to protect the downtown from such catastrophic events as the 1936 flood. The town must take steps to ensure that the integrity of the dike is not compromised and that it will continue to protect the area of development that relies on the maintenance of the dike. The vegetated dike can be seen along the bottom portion of the picture that has been included on this page. Farmington should encourage uses of the floodplain

Army Corps Dike Downtown

that are least affected by and have the least affect on the floodplain. Such uses may include agriculture, recreational fields, and protected open space. Increases in the steepness of banks such as those created when dikes are constructed, result in "channelization", a characteristic destructive to the ability of floodplains to do their job: absorbing natural, periodic increases in stream flow. Increases in channelization will create greater demands on remaining floodplains both up and downstream to absorb those floodwaters with potentially damaging results.

According to the Flood Insurance Rate Map for Farmington, prepared by the Federal Emergency Management Agency, there are many areas of Farmington within the 100-year floodplain. These floodplain areas are scattered throughout the community in association with Farmington's surface water resources. A 100-year flood plain is an area that has a 1% chance of flooding in any given year. Some areas with flood potential are shown on the floodplain maps as having incomplete data. These areas may be overlooked in applications for development with potentially unexpected results. See Map __ for more detailed information related to Farmington's floodplain areas.

8.4 Dams

In the state of New Hampshire there are over 4,400 dams registered with the Department of Environmental Services. Twenty-three of these are in Farmington**.** The most significant dams are the Berry's River Dam and the _____ Dam. The majority of dams in Farmington are related to hydroelectric operations, water supply, and recreation.

Table 3-3 Dams

NAME	RIVER	TYPE	IMPOUNDMENT (Acres)	HEIGHT (Feet)	OWNER
Cocheco River Dam	Tributary to the Cocheco River	Timber/Stone		9	GLM Inc.
Cocheco River PSC Dam	Cocheco River	Timber/Stone		6	PSNH
Ela River Dam	Ela River	Earth		6	PSNH
Cocheco Dam I	Cocheco River	Earth	4	12	New Dam
Cocheco Dam II	Cocheco River	Concrete		7.6	Mr. Wesley Rousseau
Berry's River Dam	Berry's River	Earth	28	27.5	City of Rochester
Branch Berry River	Tributary to Berry's River	Concrete	6.4	7	City of Rochester
Rattlesnake Brook Dam	Rattlesnake Brook	Stone/Earth	0.75	20	Ms. Julia Ley
Cocheco River Dam	Cocheco River				Coastal Materials Inc.
Branch Mad River Dam	Mad River	Stone/Earth			Ms. Carmelia Ardario
Dick Dame Brook Dam	Dick Dame Brook	Concrete			Mr. Vincent Tabbone
Ten Rod School Marsh	Perennial Stream	Earth / Concrete	0.1	5	Edward and Deborah Cantwell
Victor's Holding Corp. Dam	Natural Swale	Earth	2	11	Tilcon Maine Inc.
Nubble Pond Dam	Nubble Pond Brook	Earth	12	8	Mr. David Urell
Fire Pond	Natural Swale	Earth	0.57	10	Mr. Richard A Klein
Recreation Pond	Tributary to the Cocheco River	Earth	1	6	Ms. Paula Kenyon
Bouchard Pond	Springs	Earth	0.25	5	Mr. George Bouchard
Cote Recreation Pond	NA	Earth	0.33	7.9	Mr. Denis F. Cote
Rancourt Village Detention Pond	Runoff	Earth	0.17	5	Foreclosed
Voith Paper Service Northeast	Runoff	Earth	0.26	4.8	Voith Paper Service Northeast Inc.
Voith Paper Service Northeast	Runoff	Earth	0.19	15.3	Voith Paper Service Northeast Inc.
Upper Whaleback Pond	Tributary to Berry's River	Stone/Earth	11.7	10	City of Rochester
Farmington School Detention Pond I	Runoff	Earth	0.36	14	Farmington School District

8.5 Water Supply

A study is currently being conducted in the coastal watershed area by the State of New Hampshire (Department of Environmental Services, NH Geologic Survey (NHGS) and the NH Department of Environmental Services Coastal Program) and the United States Geological Survey (USGS) to provide southeastern New Hampshire communities with new tools and data needed to make informed decisions about water supply and use and to plan for future growth in their towns. The products from this study that will be available to Farmington include:

- Compilation of existing data on wells, surficial deposits, and aquifer systems.
- Development of a regional, long-term water-resources monitoring program.
- Collection of detailed water-use data, including information on withdrawals, returns, transfers and uses by different types of users in Farmington.
- Development of estimates of ground-water availability within Farmington.
- A ground-water flow simulation model will be tested on a portion of the study area.
- Surficial geology maps and data for the entire study area.
- Access to data developed for Farmington on historic water use and supply.

The proximity of the seacoast region in Southeastern New Hampshire to metropolitan Boston has led to a 36% population increase over the past 20 years. This population increase, and associated development, has been accompanied by an estimated 50% increase in the use of ground and surface-water resources for drinking, industrial, and other purposes during the same period. Ensuring the sustainability of water resources into the future will require a better understanding of the water storage and movement in surface- and ground-water systems within the region, and a thorough understanding of past, current, and future water demands. A report is expected in 2006.

Additional information on this process can be found at:
http://webster.state.nh.us/coastal/Restoration/groundwater.htm
http://nh.water.usgs.gov/CurrentProjects/seacoast/index.htm

Aquifers

A large aquifer system is found below the Cocheco River from the New Durham border to the Rochester Border. This is also the location of the most intense development in the community. The term transmissivity is used to categorize the ease with which water passes through a geologic material. Transmissivity quantifies the ability of an aquifer to transmit water, measured in cubic feet per day. According to the NH Department of Environmental Services, this aquifer

system in Farmington is composed of three different degrees of potential water yield, or transmissivity (see Map __):

- Less than 2000 cubic feet per day
- 2000 - 4000 cubic feet per day
- 4000 – 8000 cubic feet per day

The two highest yielding areas are located in the vicinity of _____ (NRI). As areas above the aquifer are further developed, buildings and parking areas will prevent water from recharging the aquifer. The placement of underground storage tanks and other potential pollution sources within the aquifer area also threatens the quality of this resource for future drinking water.

The Town of Farmington has designated an aquifer protection overlay zone based on the "5 Day Pumping Test" report completed by D.L. Maher in October 1989, delineating the 180 Day Zone of Contribution. The overlay zone generally covers the well head protection areas, and does not relate to the entire area of the aquifer itself. Because this resource is vital to the drinking water supply, protection of the aquifer should continue.

Wells

Municipal water facilities serve much of Farmington's population; however some businesses and many residents rely on drilled or dug wells for their water supply. Since 1984, every well drilled in New Hampshire must be reported to the New Hampshire Department of Environmental Services (NHDES). Of the 385 wells reported in the town of Farmington to NHDES, 317 were drilled as new wells and 50 of them were drilled as replacements for existing wells. It should be noted that according to the NHDES Water Division, the NHDES well database is known to be incomplete. The NHDES estimates that it contains only an estimated 80% of wells drilled after 1984, even though those who drill wells (individual citizens, contractors) are required to report their activity.

The wells in Farmington which were reported to NHDES range in depth from 12' to 708' with the vast majority drilled in bedrock. A bedrock well makes use of a bedrock aquifer. A well drilled into a bedrock aquifer will be constantly filled with water that flows through cracks. Eleven wells were drilled into a gravel aquifer which is more porous, and a well drilled into such an aquifer yields more water than one drilled into a bedrock aquifer.

There are several uses of wells in Farmington: domestic (serving one household); community (serving 25 or more persons); commercial or industrial, and agricultural. The majority of the wells in Farmington are domestic. There are 13 wells that are categorized as "test or exploration wells", and there is one well that was drilled as a "small community water supply". The Town of Farmington operates six wells in the _____ area off of _____ for the public water supply of the community. There is a wellhead protection area around the municipal wells.

8.6 Land Use Implications

The water resources within Farmington are abundant. Deliberate steps must be taken if Farmington is to retain a healthy supply of potable water, healthy fisheries, recreation opportunities, and other benefits. Here are a few summary points to consider related to water resources in Farmington.

1) There is a direct correlation between activity within the watershed and the quality of lakes and ponds that are fed by those watersheds. All of the activities taking place on land will eventually impact both surface and ground water. This refers to both quality and quantity of groundwater. Mismanagement in the watershed will adversely affect the water bodies down-slope and downstream.

2) Minimizing the amount of pollutants entering Farmington's waters will help avoid expensive future expenditures to treat and clean these waters.

3) Minimizing impervious surfaces in groundwater recharge areas will preserve the volume of the local water supply being stored as groundwater and in surface water bodies.

8.7 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the water resources in Farmington and their land use implications. This section will be used to identify the specific actions for Farmington to take upon completion of the master plan.

1) Pursue easements for buffers along the Upper Cocheco River, Mad River, and Pokomoonshine.

2) Continue to implement the Waterfront Protection Overlay District to provide standards for the regulation of development within 250 feet of all water bodies in Farmington.

3) Consider the regional impact statute (NH RSA 36:54-58) when reviewing development proposals that may impact shared watersheds, and continue to work proactively with neighboring communities.

4) Continue to routinely monitor the quality of existing water resources in Farmington with volunteer assistance.

5) Improve the quality of stormwater being discharged into surface waters through treatment, or stormwater detention.

6) Promote the use of permeable surfaces, and other Low Impact Development (LID) techniques that promote infiltration in the site plan review process.

9.0 POINT AND NON-POINT SOURCE POLLUTION

Within every watershed, the uses of the land and of the water have the potential to impact water quality. Water pollution can occur from two major sources: point and non-point. Point source pollution is one that can be linked to a specific pollutant or discharge point that can be identified and physically located. Non-point sources are more difficult to document, trace, or identify since there is generally not a specific point of discharge. The NH Department of Environmental Services should be contacted relative to the current status of individual sites.

The need to protect waterbodies from the danger of accelerated eutrophication and other forms of pollution was recognized by the New Hampshire Legislature in 1991 with the passage of the Comprehensive Shoreland Protection Act (RSA 483-B). Eutrophication is the natural, gradual nutrification, oxygen deprivation, and warming of a waterbody that changes the biological make-up of the waterbody. Eutrophication can be dramatically accelerated by pollution leading to a dying lake or pond having algal blooms and other problems. The final implementation of the Comprehensive Shoreland Protection Act was put into effect on July 1, 1994. This act creates a protected shoreline for public waters, but states:

> *"Municipalities may adopt land use control ordinances relative to all protected shorelands which are more stringent than the minimum standards contained in [the Comprehensive Shoreland Protection Act]..." RSA 483-B:8, I.*
>
> *"Municipalities are encouraged to adopt land use control ordinances for shorelands of waterbodies and watercourses other than public waters." RSA 483-B:8, II.*

9.1 Point Sources, Ground Water

In New Hampshire, NH DES regulates industrial and municipal discharges and privately-owned wastewater management and wastewater treatment facilities which may have a potential impact on water quality due to a direct discharge to groundwater. A groundwater discharge permit is required for such activity. Currently there are no permitted groundwater discharges in Farmington.

9.2 Point Sources, Surface Water

A pipe discharging waste into a stream is an example of a point pollution source. Since the Clean Water Act of 1971, most discharges have to be treated prior to discharge and all discharges require a National Pollution Discharge Elimination System (NPDES) permit. DES issues NPDES permits after review and approval. There are two NPDES permits issued in Farmington. Table 3-4 lists the currently permitted outfalls.

Table 3-4 Permitted Outfall Facilities

Identification #	Name	Waterbody	Status	Type
0100854	Farmington Wastewater Treatment Facility	Cocheco	Active	Major
0001112	Tilcon Maine, Inc.	Rattlesnake/Cocheco	Inactive	-

Source: http://www.des.state.nh.us/gis/onestop/

9.3 Potential Non-Point Pollution Sources

General and specific land use practices that are widespread throughout the study area can impact water quality. Some potential sources are the result of temporary or short-term land uses that require disturbing the soil, such as logging, construction, road maintenance, or agriculture operations. Others, such as stormwater runoff may be short in duration, but are continuous in nature. Non-point sources are more difficult to quantify than point sources because they impact water quality through unmonitored, intermittent, or incremental contamination and their impacts may be felt only over a long period of time. Other sources include waste disposal facilities (septic systems, landfills, junkyards, etc.), highway maintenance (sand, salt, and snow dumping), and hazardous waste. A large number of the potential sources in Farmington are sand and gravel mines in close proximity to the Cocheco River and over the known stratified drift aquifer.

Buffer strips along ponds and streams intercept and store surface runoff, allowing it to infiltrate rather than continue off site as runoff. This can reduce impacts from a variety of pollutants including phosphorus, sediment, pathogens, nitrates, and pesticides. A buffer's capacity to tie up pollutants depends on its width, Vegetation type, slope, and soil type. Studies have shown that the ability to evaluate these factors is usually beyond the ability of communities without relying on expensive studies. Instead, authorities have determined that a realistic rule of thumb is to assume that the wider a buffer is, the more removal of pollutants occurs. A 100-foot buffer is recommended for infiltration.

9.4 Land Use Implications

Point and non-point pollution sources have an adverse effect on the community . Their presence threatens both the immediate and long term health of the community. Here are a few summary points to consider related to pollution in Farmington.

1) Pollution contaminates soils and impacts water quality in the community. This results in damage to the environment and the need to engage in expensive treatment processes.

2) The value of Farmington's natural resources is directly linked to their health and the absence of pollutants.

3) There is a direct correlation between impervious surfaces and increased non-point source pollution. Reducing impervious surfaces will reduce runoff rates and increase filtering.

9.5 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the existing and potential threat from pollution sources in Farmington and their land use implications. This section will be used to identify the specific actions for Farmington to take upon completion.

1) Adopt impervious surface limits in the site plan review regulations, and encourage the use of pervious structures for areas like overflow parking lots.

2) Reduce the required road widths for new development.

3) Promote the use of Low Impact Development (LID) regulations that help manage non-point pollution and stormwater drainage.

4) Promote Best Management Practices (BMPs) to reduce nonpoint pollutants from industrial, commercial and residential developments.

5) Require maintenance plans for industrial, commercial and residential developments.

6) Apply Best Management Practices (BMPs) for the maintenance of dirt roads, and for areas adjacent to all roadways.

7) Continue to monitor and document all underground storage tanks in Farmington.

10.0 FOREST & AGRICULTURE LAND USE

10.1 History of Agricultural Lands in New Hampshire

In 1880, 64% of New Hampshire's land was in agriculture. Today less than 15% remains in farming. Traditional agricultural activity in New Hampshire is at its lowest level in history. New Hampshire ranks 49 out of 50 in the level of agricultural production in the U.S. One reason for this is that land suitable for agriculture is also excellent for development. Agricultural land is gently sloping, open, and scenic. The agricultural land that remains undeveloped adds a special rural character to the town while at the same time providing habitat for local wildlife. According to the New Hampshire Department of Agriculture the face of agricultural operations in

Agricultural Land on _____ Road

New Hampshire is changing quickly. Niche markets including specialty crops and herds, customized farm products, and small scale operations are redefining agriculture

In short, traditional agriculture and agricultural land uses in New Hampshire and Strafford County have declined substantially over the years. Land once used by small, non-mechanized farms has reverted back to forest land or has been developed. Miles of stonewalls in mature forest stands are testimony to an agricultural heritage in New Hampshire that has been lost over the past several decades. Farmington has certainly been part of that trend.

10.2 Existing Agricultural Land Use in Farmington

Traditional agricultural land use in Farmington today is still evident. Farmington has a few large contiguous tracts of important farmland soils scattered throughout the town. Meaderboro Road, between the Rochester City Line and Poor Farm Road, is the largest tract. This area is currently an active farming area with some minor residential development along the road. Other large tracts of prime farmland soils are along the Governor's Road, directly north of downtown on NH Route 153, and near Hornetown Road. There are a number of other small but possibly significant pockets throughout the town, mostly West of NH Route 11.

Some of the agricultural land in Farmington is open fields that may be "idle", meaning kept open by "brush hogging" or mowing every year or two, but not producing a crop. A variety of niche market agricultural operations exists for Farmington. These are small scale specialty operations producing and selling things like honey, berries, and other products. There is an opportunity to encourage growth in this small, but critical land use as a technique for preserving agricultural lands and the community's character.

The western portion of Farmington still has a rich agricultural character, but increasing residential activity is putting pressure on the existing farm operations. Many of the remaining farm families have been working the land in Farmington for several generations, and continue to promote a land ethic.

10.3 Land Use Implications

Farmington's agricultural resources and activities have an effect on land use decisions and impact the character of the community. Here are a few summary points to consider related to agriculture in Farmington .

1) Preserving the possibility of farming in the future adds to the sustainability and diversity of the community. If agricultural resources are converted to residential and business uses they will not be viable options for producing goods locally.

2) There is an economic benefit when produce and products are generated locally, and the land does not require the high level of town services that development demands.

3) Agricultural lands add to the visual and habitat diversity of the landscape, and contribute to the character of the community. This landscape creates a "sense of place" that is specific to Farmington and cannot be recreated.

4) Recent events in Farmington indicate increasing willingness on the part of the farming community to sell and to a lesser degree donate easements that would protect farmlands.

10.4 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the status of agriculture in Farmington and the associated land use implications. This section will be used to identify the specific actions for Farmington to take upon completion.

1) Pursue protection of the limited agricultural land that remains through outright purchase, purchase of easements/development rights, municipal bonding, and donations.

2) Require open space developments in areas involving agricultural land. Concentrate all the development on the non-agricultural land areas.

3) Make all of Farmington's land use regulations "farm friendly" and support non-traditional agricultural operations (small scale, seasonal, organic, specialty or "niche markets").

10.5 Forest Lands

According to the Society of NH Forests (SPNHF) report New Hampshire's Vanishing Forests (2001) 35 tree farms exist in Farmington with a total acreage of 3,852 or 16.5% of the town. Forestland has many uses. Timber harvesting is the most obvious use, but other uses and functions include recreation, wildlife habitat, water quality protection, open space, scenic enhancement, etc. These are all important uses for the people of Farmington, both from a quality of life and economic standpoint.

10.6 Forest Planning

From a planning perspective, woodlands are not just a source of wood products, and tax revenue. The forest industry also provides many area jobs. Woodlands also play an important role in providing areas for outdoor recreation, wildlife habitat, and scenic enjoyment. They play a role in the water quality of Farmington's ponds and streams. All of these uses are sustainable, and each can co-exist. Timber harvesting, while having dramatic visual impacts in some cases, is rather short-term. However, subdividing large woodland parcels into small lots for development can have a long term, nearly irreversible impact.

Considerable care should be taken during both commercial timber cuts and cuts to create open space for development to ensure the conservation of soils by mitigating erosion. Because large forested tracts are another aspect of the rural character of the community, visible clear cuts, either for commercial harvests or for development, should be carefully avoided or buffered.

"Viewsheds," the views available to residents and tourists while driving, hiking, etc, and the impact of large clearcut areas on a viewshed are an important consideration when the stated goal of the community is to maintain the rural character. The maintenance of important forested and agricultural views should be encouraged, by encouraging selective cuts, or smaller clearcuts with active replanting.

New Hampshire's Vanishing Forests (2001) found that while New Hampshire remains predominately forested, the amount of forest cover will decline to 80% statewide within the next 20 years, and of that, less and less will be committed to long term forest management in large tracts. Additionally, most landowners no longer rank timber production as their main reason for owning the land. Only 10% of the landowners include timber production as the primary reason, with aesthetic enjoyment now more than 50% of the landowners' reason for owning the land.

It was found that parcels of land 500 acres or more are the most common for long term forest management due to economies of scale. With regard to the short-term impacts of logging, the town has a built in mechanism to monitor logging operations – the notice of 'Intent to Cut.' Once an 'Intent to Cut' is filed, it is reviewed to determine if the logging operation is going to impact sensitive or critical natural resource areas, such as wetlands, deer yards, fragile biotic communities, etc. Landowners and foresters could be educated to the need to carry out logging operations in a manner sensitive to important natural resources. It could also help to identify logging operations that are planned on areas used for recreation such as paths and trails. Steps could then be taken to work with landowners and foresters to temporarily close or re-route trails during the logging operations.

10.7 Land Use Implications

Farmington's forest resources have an effect on land use decisions and impact the character of the community. Here are a few summary points to consider related to forest lands in Farmington.

1) Forest resources provide habitat, erosion control, water filtering, improved air quality, and temperature regulation. These resources also pay their own way in terms of town services because of the little they demand.

2) Responsible harvesting of forest resources supports the local economy, and provides access to local forest products. The working landscape contributes to the character of the community.

3) Clearcutting and disregard of BMPs can result in erosion and non-point source pollution that creates problems for abutters and the community.

10.8 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the status of forestry in Farmington and the associated land use implications. This section will be used to identify the specific actions for Farmington to take upon completion.

1) Farmington should consider having a licensed forester inspect all logging jobs to insure compliance with wetland and erosion and sediment control regulations. The forester could also inspect the sites relative to the amount of timber harvested. This may increase the amount of tax revenue from logging in Farmington, and provide an opportunity to educate loggers on Best Management Practices (BMPs) to use on site.

2) The minimum lot size in zones with valuable forest resources should be examined. Subdivision of land into small units makes logging difficult.

11.0 CONSERVATION LANDS

Conservation areas are those lands protected for the foreseeable future through outright preservation by governmental or conservation organizations, or through conservation easements. Farmington has nine properties that have been set aside as conservation land. Table 3-5 shows the acreage amounts for these lands which cover 5.1% of the total land area in Farmington.

Table 3-5 Farmington Conservation Lands

Property	**Management**	**Acres**
Blue Job Wildlife Management Area	NH Fish and Game	589.8
Blue Job State Forest	NH Department of Resources and Economic Development	116.6
Blue Job State Forest	NH Department of Resources and Economic Development	283.6
Wellhead Protection Area	Town of Farmington	17.5
Mad River	NH Fish and Game	61.3
Mad River Tract II	Town of Farmington	4.3
Abbotts Grant – Town Forest	Town of Farmington	50
Reservoir Pond	City of Rochester	45
Whaleback Pond	City of Rochester	27.3
Total		**1195.4**
Percent of Total Land Area in Farmington		**5.1%**

Source: GRANIT - http://granitweb.sr.unh.edu/clv_phase1/viewer.jsp

Additional parcels and acreage information to be generated by the NRI

The information for conservation lands in Farmington shown in Table __ and Map __ most likely does not include all protected land in Farmington. Determining specific lands in Farmington that are protected is not an easy task, since information on easements, etc. is not necessarily readily accessible. It is also important to note that ownership by a community or the state does not guarantee that these properties will be permanently protected unless a conservation easement of some kind is also placed on the property.

11.1 Moose Mountains Regional Greenways

Farmington is very fortunate to be a member of Moose Mountains Regional Greenways. Working with five neighboring communities (Brookfield, Middleton, Milton, New Durham, and Wakefield) to connect existing conservation lands to form corridors or "greenways" throughout the region is a monumental step toward conservation of the region's most valuable natural resources. More information on Moose Mountains Regional Greenways can be found at: http://www.moosemountaingreenway.org/

11.2 Unfragemented Lands
(data will be generated during the NRI and presented here)

11.3 Current Use

NH RSA 79A allows landowners to place certain types and sizes of land in a tax abatement program based on their current land use. Table 3-6 shows the current distribution of acreage in Farmington in current use. This acreage is approximately __% of the total land area in Farmington. Map __ shows the parcels in Farmington that have received current use designation. The map also indicates which of these parcels allow access to the public.

Table 3-6 Current Use

Current Use Category	**Acreage**
Farm Land	
Forest Land	
Unproductive Land	
Wetland	
Total	
Percent of Total Land Area in Farmington	

(from the NRI)

While current use reduces the burden for landowners, land can be taken out of current use with payment of a penalty. Therefore, it does not provide absolute assurance of continued open space. The penalty is 10% of the assessed value of the lands. Under state law, towns can vote to have all or a portion of the money collected for taking land out of current use to be placed in a conservation fund administered by the Conservation Commission. Over 120 towns in the state have voted to do this in order to provide a source of revenue for conservation studies, and land protection efforts. Farmington collects 75% of the penalty each year for the conservation fund. There is no cap on the amount that can be collected annually in Farmington.

11.4 Land Use Implications

Farmington's conservation lands have an effect on land use decisions and impact the character of the community. Here are a few summary points to consider related to conservation lands in Farmington .

1) Conservation lands provide habitat, recreational opportunities, and protect critical natural resources. These resources also pay their own way in terms of Town services.

2) Conservation lands contribute to Farmington's character as a community, and support its quality of life.

11.5 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the conservation lands in Farmington and the associated land use implications. This section will be used to identify the specific actions for Farmington to take upon completion.

1) Increase efforts to secure conservation easements on undeveloped land with significant natural resources.

2) Pursue conservation easements, or other forms of protection, on lands adjacent to permanently protected parcels in order to preserve contiguous corridors of undeveloped land.

3) Partner with other conservation based organizations, such as Moose Mountains Regional Greenways, working in Farmington and the region to increase funds, access a wider audience, prioritize parcels for protection, and pursue land protection efforts that will benefit the community and the region.

4) Bond money for conservation purchases.

5) Identify town owned (and other) lands that would be suitable for the expansion of community facilities and place easements on town lands which are considered more environmentally sensitive.

12.0 WILDLIFE RESOURCES

12.1 Habitat

The diverse habitats of Farmington include fields, wetlands, upland hardwood and softwood forest. Farmington lies within the "Southern New England Coastal Plain and Hills Section" bioregion and is mostly in the "Gulf of Maine Coastal Plain Subsection" of that bioregion. (Only the western corner of Farmington is in the "Sebago-Ossipee Hills and Plain Subsection" of the bioregion).

Wildlife communities are defined as "groups of species that occur together in a particular habitat." Plant species can constitute a community of their own, but also provide a habitat for an animal community. Different habitats are necessary for different animal species, and even one species will often require multiple habitats throughout its life cycle. Since the well-being of any one animal species is dependent upon an exponential network of other animal and/or plant species, the loss of one habitat can affect an animal species that does not necessarily live in that habitat.

The ability of wildlife to roam through their natural range within continuous forest cover is very important. Habitat fragmentation can cut off breeding, foraging, and hunting areas, disrupting animals' life cycles. Large developments that remove or fragment wildlife habitat should be carefully reviewed and the impacts on habitat should be minimized to the degree possible. Additionally, when humans move into an animals range, the incidences of human/animal interaction tends to increase and can be dangerous. Animal/automobile accidents occur and curious animals may become dangerous pests around homes. Riparian areas are extremely important as wildlife habitat. Approximately 90% of New England species use riparian areas for nesting, feeding, and transportation.

12.2 Species

The better known mammal species include moose, white-tailed deer, black bear, rabbit, squirrels, woodchucks, eastern coyote, beaver, muskrats, raccoons, otter, mink, bats, possum, red fox, fisher, and bobcat. Amphibians such as the spotted salamander, newts, toads, tree frogs, bullfrogs, and the morning spring peeper are typically found at the water's edge. Reptiles include box turtles, and 11 species of snakes including the garter, milk snake, and black racer.

Nearly 200 species of birds can be found in their various habitats in the area including hawks, 25 species of warblers, many different species of finches, owls, and flycatchers. Many different types of waterfowl reside in the area including Canada geese, mallards, blacks, wood ducks, and mergansers. Blue heron can often be seen in streams and wetland areas. Newcomers include the turkey vulture and the wild turkey.

12.3 Endangered/Threatened Plants and Animals

Not all of New Hampshire's wildlife is thriving. The NH Fish and Game Department maintains a list of endangered or threatened animal species in New Hampshire. Migratory birds including the bald and golden eagle and osprey do pass over the area from time to time. According to the New Hampshire Natural Heritage Inventory, a variety of rare plants, vertebrates, and natural communities may be found in Farmington. Though their exact locations are generally not revealed for obvious reasons, their basic locations are available through the Natural Heritage Inventory. The only confirmed species that has been spotted in Farmington in the last 20 years is the Small Whorled Pogonia (Isotria medeoloides) which has been reported on six occasions.

12.4 Hunting

The northeast is an excellent area for recreational hunting and Farmington's community of recreational hunters is strong?. Farmington's natural resources currently support big game, such as deer and moose, and smaller game such as beaver, mink, hare, grouse and woodcock. Some areas within Farmington have been identified as deer wintering areas. These are areas that were mapped by the NH Fish and Game Department using aerial photography, and are identified as those areas having a thick evergreen cover. The mapping of these wintering areas or "deer yards" as they are sometimes called, is over 15 years old and needs updating to account for logging, development, and regrowth. While not on a major flyway for migratory birds, Farmington does offer suitable habitat for both short-term migratory waterfowl, and for resident birds.

12.5 Fishery

The water bodies in Farmington also contain a wide range of fish species. The New Hampshire Fish and Game Department keeps records on predominant fish species found in the largest ponds and brooks organized by town. According to the Fisheries Biologist at the New Hampshire Fish and Game Department, Farmington's fish population includes the following:

Baxter Lake
-Large Mouth Bass
-Small Mouth Bass
-Pickerel
-Bullhead

Rochester Reservoir
-Large Mouth Bass
-Small Mouth Bass
-Pickerel
-Bullhead
-Yellow Perch
-Common Sunfish
-White Sucker
-American Eel
-Golden Shiner
-Common Shiner

Rivers & Streams
-Blacknose Dace
-Brook Trout
-Brown Trout
-Fallfish
-Golden Shiner
-Lakechub
-Longnose Dace
-Longnose Sucker
-Rainbow Trout
-Slimy Sculpin

12.6 Land Use Implications

Farmington's wildlife resources have an effect on land use decisions and are impacted by them as well. Here are a few summary points to consider related to wildlife resources in Farmington .

1) Habitat is easily fragmented by new development. This disrupts the landscape and impacts wildlife movement and survival.

2) Wildlife resources are critical to many recreational activities that support open space conservation (i.e. hunting, fishing, and bird watching).

12.7 Potential Actions

There are an array of possible actions the Town may want to consider pursuing as it evaluates the status of wildlife in Farmington and the associated land use implications. This section will be used to identify the specific actions for Farmington to take upon completion

1) Protect areas that are known to support or have the potential to support important wildlife.

2) Concentrate habitat protection efforts on preserving corridors between habitats and protected open space, particularly along waterways, to allow wildlife to avoid conflict with humans while maintaining the ability to gain access to food, shelter, water and breeding areas.

3) Provide opportunities for the public to learn about local wildlife and potentially view it.

13.0 SUMMARY

The primary focus of this Chapter is to identify the natural resources in Farmington, recognize the role they play in giving the town its character, and decide what strategies would best maintain that character. All of the community's resources are interconnected, and any change to one can have a significant impact on the others. As the population increases, demands on many of these resources will increase, possibly to the point of threatening the quality and quantity of the resource. The goal of this Chapter is to help develop a balance between development and resource protection within Farmington that will guide future sustainable development of the community.