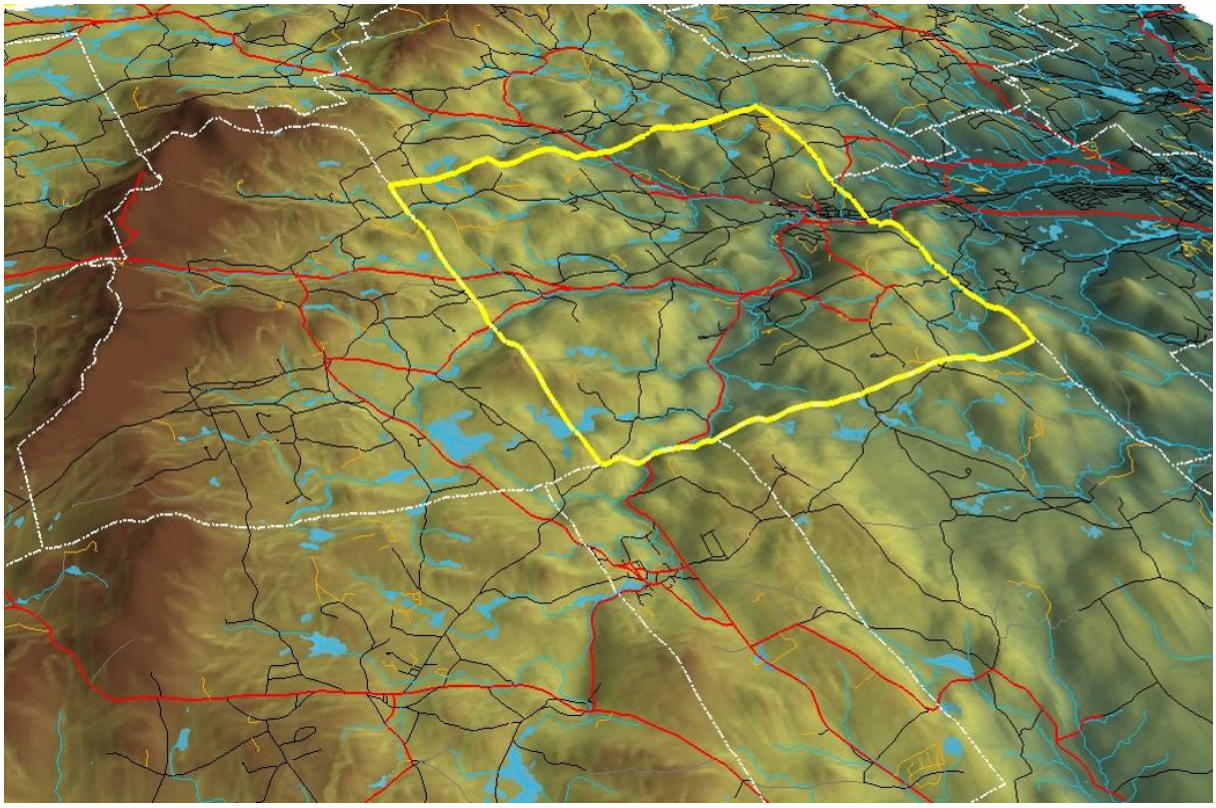
Town of Wilton, New Hampshire

Natural Resources Inventory



Prepared by:

Society for the Protection of NH Forests

Dan Sundquist
Director of Land Conservation Planning

David McGraw
GIS Manager

Prepared for:

Wilton Conservation Commission

April 17, 2009

Approved by the WCC on June 8, 2009

Table of Contents

Wilton Natural Resource Inventory

EXECUTIVE SUMMARY

Background

Located along a major state arterial highway (Route 101) ten miles west of New Hampshire's rapidly urbanizing Merrimack River corridor, the town of Wilton conveys a remarkable sense of community and rural quality of life that flows both from its history and its environmental setting. Spanning more than 25 square miles, the town is a gateway between the more developed towns of Milford and Amherst to the east, and the very rural and undeveloped Wapack Range in the town of Temple to the west. Through its valley heart flows the Souhegan River, which joins with Blood Brook and Stony Brook from the north at the historical and cultural center of the village of Wilton on the town's eastern border.

To advance the long-term protection of the town's natural resources, the Wilton Conservation Commission (WCC) engaged in a partnership with the Society for the Protection of New Hamsphire Forests (Forest Society) research department to gather and analyze data, to create reference maps, and to interpret the relative importance and protection status of a range of natural resources selected for study by the conservation commission.

Funding for this project was provided by the Conservation Commission through town appropriations made to conduct such studies. This ***natural resource inventory*** (NRI) also builds upon previous work accomplished by the Conservation Commission, and other agencies.

Wilton's Changing Landscape

The last two decades have seen significant change in population growth and land use conversion in Wilton, creating development pressures on the natural resource land base in town. Population has jumped 28% – nearly 900 persons – since 1990. The town is projected to grow by another 850 persons by 2030[1]. New housing construction has added nearly 300 new single family homes in the same time period, an increase of about 30%. At current occupancy rates, around 340 new homes will need to be built over the next twenty years. Where will these homes be located, and what will the impact be on the town's natural resources: drinking water, farmland, economic forest land, wildlife habitat, and remote recreation opportunities? How will Wilton's rural quality of life change?

With growth and land use conversion comes the loss of important natural resource values provided by undeveloped land, especially for wildlife habitat, clean water, and the broader spectrum of "ecosystem services". The more intangible rural quality of life – the sum total of the natural and cultural resources of Wilton will also be affected. To ensure a healthy natural and cultural environment into the future, it is essential that the town identify, retain, and protect the remaining undeveloped lands and waters that support the most important of these natural resource values and functions.

[1] N.H. Office of Energy and Planning, Population Estimates, 2007

Fortunately, it is not too late to protect the essential natural resources of Wilton. Thanks to the legacy of state-owned public lands, and the foresight and dedicated efforts of the town conservation commission and conservation-minded citizens, almost 20% of the town is now permanently conserved. These protected lands and waters form the basis of a network of conservation areas that will help to safeguard the town's most critical natural resources, and provide opportunities to expand and link to key, unprotected land in the future.

By considering natural resources information in community planning and decision-making, Wilton citizens can make a meaningful contribution toward maintaining a high quality of life for residents, and can help to preserve New Hampshire's irreplaceable natural heritage.

Goal Statement

The primary goal of this natural resource inventory is to build a science-based information system of maps and data that helps to focus conservation efforts on those lands and waters that are most important for conservation. This in turn will allow the town to:

- Develop a town-wide conservation plan, and
- Evaluate ordinances, land use regulations and development applications.

Identifying Conservation Priorities

Six principal resource analyses and maps were developed that capture key natural resource features in Wilton. The maps that reflect the best remaining opportunities to conserve include:

- *Forest and Farm Resources*
- *Water Resources*
- *Critical Wildlife Habitat*
- *Historic & Cultural Resources*
- *Scenic Resources*

These resource maps work to provide a visual reference to the location, and often the many-layered coincidence of various natural resources. An overlay of the town's tax parcel map on each map helps to locate natural resources that may exist on a given parcel or, in many instances, multiple ownerships, helping the conservation commission to plan outreach and communication.

A ***resource co-occurrence map*** was also prepared to aid in identifying areas where several habitat values coincide and overlap, thus signaling locations with multiple conservation values and potentially higher priority for conservation.

Resource Protection Status

Wilton currently enjoys more than 3,200 acres of permanently protected land, or about 20% of the town's land area, in various locations around the town. The last ten years has seen about 1,220 acres of land conserved, signaling a concerted, on-going effort on the part of the Conservation Commission and local land trusts to protect important farm and forest land in town. On unprotected lands around town, current use assessment helps to maintain approximately 60% of the town's taxable land in a

natural condition. However, many important natural resources remain under-protected; the following table lists several of the most important resource factors, their acreage extent, and protection status.

Natural Resource Factor	Acres in Wilton	Percent Land Base	Acres Protected	Percent Protected
Forest Cover	12,690	78.0%	2,711	21.4%
Productive Forest Soils	11,892	73.0%	1,850	15.5%
Best Agricultural Soils	1,596	9.8%	214	13.4%
Agricultural Land Uses	1,335	8.2%	254	19.0%
Wetlands & Hydric Soils	1,489	9.2%	325	21.8%
Riparian & Shoreland Buffers	2,786	17.1%	572	20.5%
Aquifers	3,370	20.7%	675	20.0%
Drinking Water Protection Area	1,740	10.7%	223	12.8%
Wildlife Habitats (WAP tiers)	2,414	14.8%	707	29.3%

Obviously, Wilton's agricultural soil, farmed lands, and drinking water protection areas have relatively low levels of protection. While some natural resources appear to have relatively high levels of protection, the question remains: how much is enough? Additional information and interpretation of the importance of various natural resources can be found in the full report, along with more detailed statistics on many more resource factors in ***Appendix A***.

Implementation: Onward to a Conservation Plan

This collection of analyses and maps serves as a foundation of information on significant natural resources in the town. While this wealth of information can be very useful in community planning and conservation efforts in Wilton, the results of this NRI should be seen as a necessary first step in the preparation of a townwide conservation plan.

With a little more work, all of the natural resource "suites" of data that are grouped in the four maps noted above should be evaluated, weighed, and developed into a master resource co-occurrence map, which then can be distilled into conservation focus areas that represent the very best opportunities for conservation as well as the best use of limited conservation funding.

Such a planning exercise should involve a broad stakeholder group of town citizens who represent not only expertise in the natural resource realm, but also are knowledgeable about historic and cultural heritage resource values, community planning, and town infrastructure. In this way, a true "shared vision" of community priorities can be given shape and form that will endure into the future.

I. REPORT INTRODUCTION

This report presents the details for the 2008 natural resource inventory (NRI) of Wilton, New Hampshire. Through a formal Request for Proposal process, the Wilton Conservation Commission (WCC) contracted with The Society for the Protection of New Hampshire Forests (Forest Society) to carry out this inventory. This report was written by the Forest Society and represents one of the final deliverables associated with the project.

WCC entered into this project in part to meet its statutory obligation under RSA 36-A:2 [2] which states that a town, having established a conservation commission for the proper utilization and protection of its natural resources and watershed resources, shall prepare an index of all open space and natural, aesthetic or ecological areas within the town, as well as all marshlands, swamps and all other wetlands, for the purpose of recommending to the selectmen a program for the protection, development or better utilization of all such areas.

Project Goals & Objectives

The primary goal of this project is to gather, map and analyze information on the natural resources of Wilton, which will in turn serve as a critical tool to help the town

- Develop a town-wide conservation plan, and
- Evaluate ordinances, land use regulations and development applications.

Key objectives of the NRI include:

- Map and describe important natural resources, including forest and farm lands, water resources critical to habitats and as drinking water supplies, and a range of wildlife habitat values.
- Through GIS[3] based co-occurrence mapping, provide a prioritized basis for conservation action to protect the most important wildlife habitat features in town.
- Develop a scenic resource and viewshed analysis to identify lands important to maintaining Wilton's scenic and rural character.
- Determine the current protection status of the natural resources studied, and interpret relative importance to help guide development of a future strategic conservation plan.

Project Contributors

This study and report would not be possible without the continuing involvement and participation of Dawn Tuomala and the members of the Wilton Conservation Commission, who include:

Lynne Draper	William Mahar	Leslie Tallarico
Spencer C. Brookes II	W. Bart Hunter	
Laurence Coronis	H. Alan Preston	

[2] RSA 36-A, Conservation Commissions, http://www.gencourt.state.nh.us/rsa/html/III/36-A/36-A-mrg.htm

[3] Geographic Information System: integration of hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

The Wilton Conservation Commission was assisted by the Wilton Heritage Commission and members of the Wilton Planning Board. The GIS mapping and analysis was conducted by a staff team at the Society for the Protection of NH Forests research department, led by Dan Sundquist, director of land conservation planning with intensive mapping and data development by Dave McGraw, GIS manager and specialist. This project was funded by the Wilton Conservation Commission

II. WILTON'S IMPORTANT NATURAL RESOURCES

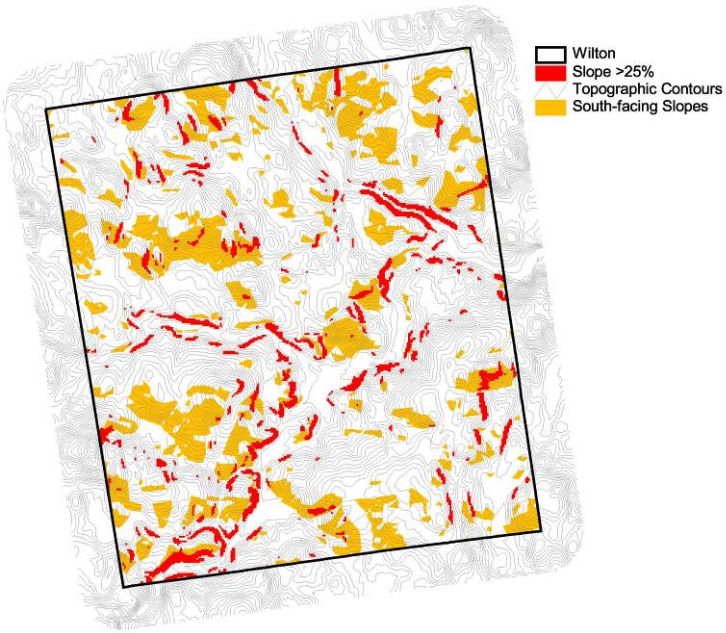
Introduction

The intent of this section is to characterize the extent, distribution and relative importance of the various natural resources included in the GIS mapping and interpretation described later in this report. General geographic data is presented in the discussion below. Please refer to **Table 1** below for a detailed breakdown of acreages and percents representing the town's natural resource land base.

Terrain

Identifying the physical structure and composition of a community's natural landscape is an important starting point and context for evaluating its specific ***natural resource suites***. Terrain provides the basic conditions for understanding how a landscape evolves into areas distinctly valuable for specific natural functions such as agriculture, forestry, hydrology, and wildlife habitat, or cultural functions such as scenic vistas.

Due to glacial erosion and deposits 10,000 years ago, Wilton's topography presents fairly subtle topographic change, with low-lying, rounded hills distributed in a complex pattern across the town, but generally gaining elevation westward towards the Wapack Range in the town of Temple. In contrast, the broad, low-lying Souhegan River valley and corresponding but smaller valleys of Blood Brook and Stony Brook are remnant glacial rivers and outwash plains that drain east to the town of Milford. Such distinct structural landforms also exhibit very different natural functions and processes, and resulting natural resource values. Wilton's best farm soils are often found on the ridges and hilltops, while the river floodplains contain the town's best gravel aquifers and water supplies.



Steep slopes and solar aspect are important terrain considerations in conservation planning. Slopes in excess of 25% gradient are considered unbuildable due to site grading and erosion issues. Steep rocky slopes offer den sites and sunning areas, important to bobcat and other species. South-facing slopes on lower gradients (~10%) are also valuable wildlife sunning areas and with conifer tree canopy and often host deer wintering areas. See map at left.

Steep slopes tend to be found along river valley walls, and amount to about 850 acres town-wide; they are currently only 17% protected. South-facing slopes occupy 3,145 acres, and are 23% protected.

Land Cover

Land cover can be thought of as the mantle of surface features that lie on the physical landscape. Land cover types can be divided into naturally occurring vegetation or other features such as rock outcrops, versus human land uses such as farming, residential uses, human enterprises, and associated developed or cleared land.

Much of Wilton is forested – about 78% or nearly 13,000 acres – with 75% of the forest cover being hardwood dominated (or mixed hardwood/conifer) and about 25% in pure conifer forest types. About 8% of the land base is in agricultural land use or open grasslands, 1% is represented by open surface waters (lakes, ponds, rivers), 9% in forested and non-forested wetlands, and about 10% in various types of developed land uses, including transportation, gravel pits and other open lands.

A detailed listing of the land cover types follows:

Table 1

Land Cover Type	Acres	Percent Total Land Area
Developed	330	2.0%
Transportation	778	4.7%
Active Agriculture	62	0.4%
Row Crops	1,150	7.0%
Orchards	508	3.1%
Beech/Oak Forest	2,834	17.2%
Paper birch/aspen	65	0.4%
Other Hardwoods	129	0.8%
White/Red Pine	1,916	11.6%
Spruce/Fir	95	0.6%
Hemlock	1,303	7.9%
Mixed Forest	6,325	38.5%
		0.0%
Water	182	1.1%
Forested Wetlands	24	0.1%
Non-forested Wetlands	208	1.3%
		0.0%
Disturbed	72	0.4%
Cleared/Other Open Land	466	2.8%
	16,447	**100.0%**

These figures are derived from the state's land cover mapping issued in 2001, which is generated from satellite imagery with a resolution of 30-meters per grid cell. While the accuracy of the data is quite high statewide, it should be regarded as a coarse approximation of resource distribution at community scale. More precise GIS measurements and calculations are found in later sections.

Forest Resources

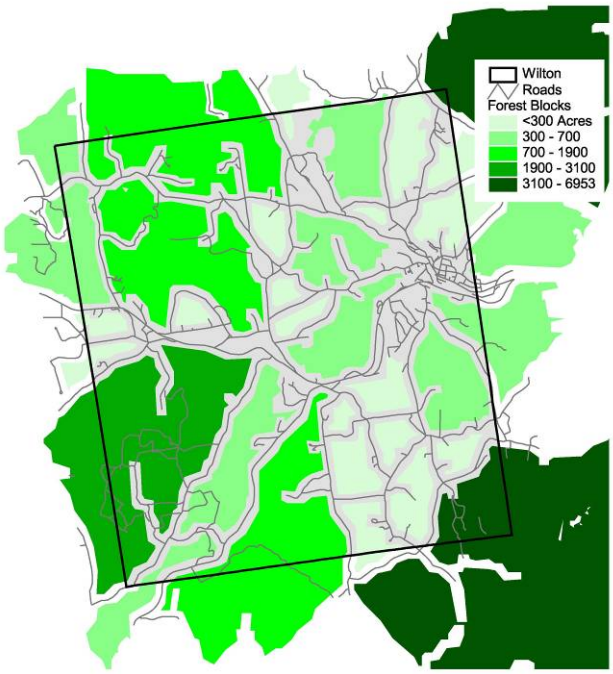
Introduction

Farms and forests represent the great "working landscapes" of New Hampshire. They are important both historically and currently. The economic value that open space farms and forests represent has been calculated at more than $1.6 billion per year[4], or about 30% of the state's gross domestic productivity from its open space economic sectors. This includes only the products that flow from these working landscapes. If we add the less tangible service values and scenic resources they provide to tourism and recreation, the value rises to more than $5.2 billion. In terms of community legacy and integrity, forests and farming are much of what we ascribe to New Hampshire's quality of life.

Forest Structure

Wilton's extensive forests are comprised of several forest blocks ranging in size from less than 100 acres to more than 2,200 acres in town. A ***forest block*** is an area of intact and continuous forest canopy, without regard to property or political boundaries. Block edges are defined by highways and local roads, non-forest land uses, or by large water features.

Blocks function as structural matrices for wildlife habitat, with block-to-block connections being important for the movement of wildlife. Large forest blocks are also important for the natural management of water quality and quantity, and as an economic resource to sustainable forestry.



The map at the right shows the mosaic of forest blocks within town, and extending beyond into neighboring communities. Blocks smaller than 25 acres have been deleted for simplicity. The gray background shows where the forest cover is fragmented by transportation corridors primarily. Two large forest blocks of 3,100 and 6,900 acres are located in the northeast and southeast corners of Wilton. The 6,900 acre block extends into Milford, Mason and Brookline, and represents one of the most significant intact forests in southern New Hampshire. See ***Appendix A*** for more detailed data on forest blocks and protection status. Note that a special classification system of block sizes was used for statistical breakdown purposes, and the map above is a simplified version for the sake of clarity.

[4] *The Economic Impact of Open Space in New Hampshire*, The Society for the Protection of NH Forests, 1999.

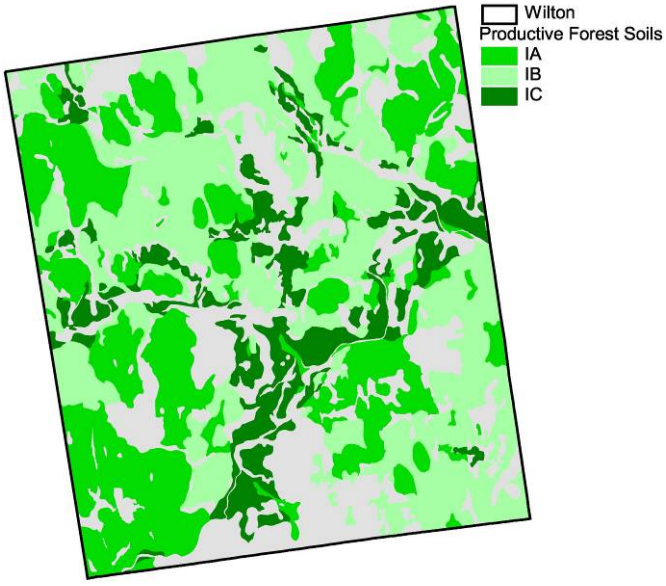
Approximately 2,710 acres (21%) of Wilton's 12,690 forest acres are currently protected. Two of the larger forest blocks in town are only about one-third protected –the 2,300 acre block home to the Heald properties and Sheldrick Forest is 39% protected, and the 1,870 acre block dominated by the Abbott State Forest is 35% protected. Many other sizeable forest blocks in town are much less protected, or not protected at all.

Intact forest cover of this extent is not common in New Hampshire, especially east of Wilton in the urbanizing Merrimack River valley. It not only represents important wildlife habitat for a range of species, but is also considered significant in terms of long-range ecological processes such as soil nutrient accumulation and old growth forest species. See the ***Wildlife Habitat*** section below for more detail on forested habitat and the role of forest blocks in the NH Wildlife Action Plan.

Productive Forest Soils

Apart from the obvious economic values noted above, forests are also directly linked to the quality of other natural resources typically considered in natural resource inventory and conservation planning. The structure, composition, and ecological processes at work in forests are critical to a myriad of wildlife habitat values. Forests are also integral to maintaining water quality and regulating water quantity as they relate to both the natural world and to human uses.

While long-term forest management plans seek to maximize all the benefits and uses of our forests, the innate productivity of any forest is dependent in large part on landscape position (elevation, topography, etc.), and especially on soil types. These relationships have been well-studied in New Hampshire, and we are fortunate to have soils mapping that includes groupings of soil types according to general productivity and forest type. Three important forest soil groupings are of special note. These soils groupings can be thought of as our "most productive forest soils" for the given forest types, although forest management can and does produce significant economic results on less productive soils.



The map at right shows the extent and distribution of the three most important forest soils in Wilton.

1A Soils

This group consists of deeper, loamy textured, moderately- and well-drained soils. Generally, these soils are more fertile and have the most favorable soil moisture for forest growth. The successional trends on these soils are towards stands of shade-tolerant hardwoods such as beech and sugar maple. Mixes of other hardwood species including yellow and white birch, aspen, white ash and red oak in combination with hemlock, spruce, fir, and occasionally white pine also occur.

In Wilton, these soils are typically loam and sandy loam soil types found on glacial till deposits on broad ridge tops and terraces north of the river valley, with a significant cluster in the southwest quarter of the town. 1A soils total more than 4,575 acres, or 38% of Wilton's most productive forest soils. Only 18% of this soils group is currently protected.

1B Soils

Soils in this group are generally fine sandy loams, stony sandy loams, and complexes of several soils over till substrates. They are slightly less fertile than soils in group 1A. These soils are moderately- to well-drained and available soil moisture is adequate for tree growth but may not be as abundant as 1A soils. Succession trends towards a climax of tolerant hardwoods, predominantly beech. Cut-over stands are commonly composed of a variety of hardwoods similar to those listed in group 1A above.

Wilton's 1B soils form a ubiquitous matrix of "background" soils throughout the town, and are especially prevalent northwest of Wilton Center, and in the southeast quarter of town. They are also typically found down-slope from and in close association with the 1A soils noted above. 1B soils cover approximately 5,549 acres, or constitute about 47% of the three productive soils detailed here. About 12% of the town's 1B soils are now protected.

1C Soils

These soils are comprised of loamy sands on outwash sands and gravel formations. Soil drainage is *somewhat excessively*- to *excessively*-drained or *moderately*-drained. Soil moisture is adequate for good softwood growth, but is limited for hardwoods. Successional trends on these coarse-textured, somewhat droughty soils are towards shade-tolerant softwoods such as red spruce or hemlock. White pine, red maple, aspen and paper birch are typical in mid-successional stands. Due to less hardwood competition, these soils favor softwood production, and ***provide the best high-volume white pine conditions in the state.***

Wilton's 1C soils are deep sandy loam and loamy sands found on kame terraces, in older, glacial alluvial deposits primarily just above the Souhegan River and Blood Brook floodplain. They thus form a continuous corridor of soils directly associated with major watercourses, running from the southwest and northwest east across the town. A secondary cluster of 1C soils is also found along Stony Brook in the northern part of town. 1C soils account for only 1,767 acres in Wilton, or 15% of the productive soils. Less than 19% of 1C soils are currently protected.

It should be noted that most of Wilton's 1A and 1B soils are classed by the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS) as highly erodible or potentially highly erodible if disturbed. 1C soils are generally not highly erodible because they are flat. Since 1A and 1B soils are also found on steep slopes, ranging typically from 15% to 25%, conversion to other land uses such as residential development brings a considerable risk to the town's water quality due to soil erosion and sedimentation. About 9,800 acres of these soils are classed as highly erodible, and another 15,600 acres are potentially highly erodible, which amounts to about 95% of these soils in town.

Agricultural Resources

Productive Agricultural Soils

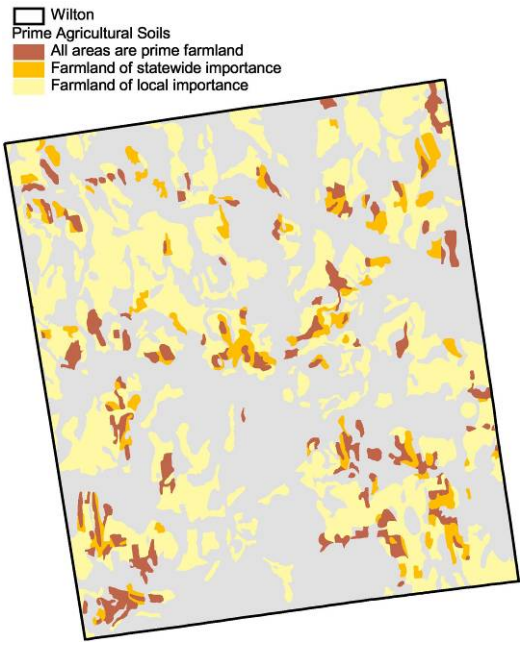
The Farmland Protection Policy Act of 1981 was established to assure that Federal programs are administered in a manner that will be compatible with state and local governments and private programs and policies to protect farmland. The NRCS uses the following criteria in New Hampshire for the purpose of carrying out the provisions of this Act.

- Prime agricultural soils: interpreting from technical soils data, prime agricultural soils have sufficient available water capacity to produce the commonly grown cultivated crops adapted to N.H. They have high nutrient availability, generally low slope and low landscape position, are not frequently flooded, and contain less than 10% rock fragments in the top six inches. Prime agricultural soils are best suited for cornfields and other row crops.

- Soils of statewide importance: land that is not prime but is considered farmland of statewide importance for the production of food, feed, fiber, forage or oilseed crops. Hay meadows not normally in row cropping could indicate soils of statewide importance.

- Soils of local importance: farmland that is not prime or of statewide importance, but has local significance for the production of food, feed, fiber and forage. In Hillsborough County, this includes all land that is in active farm use, but does not qualify as prime or of statewide importance. Pasture land and hay meadows may be common indicators of locally significant soils.

Excellent agricultural soils are found evenly and widely distributed across the entire town of Wilton. These soils tend to cluster on the broad ridge tops similar to and in conjunction with the most productive forest soils discussed above.



The map at the left shows the distribution of prime agricultural and statewide importance soils in the town. Soils of local importance are also shown in a light color. While not used in the resource co-occurrence analysis described later in this report, they exist extensively in Wilton and are sometimes associated with remnant agricultural lands in the form of hay fields and meadows.

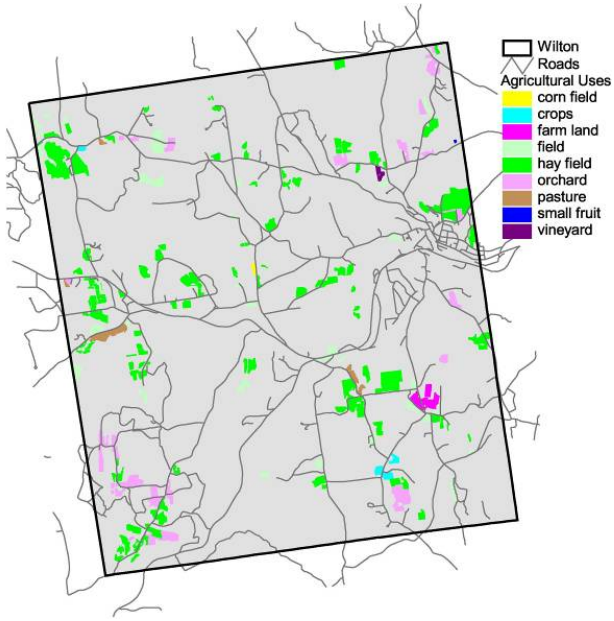
As indicated by the map, Wilton's agricultural soils are predominantly soils of local importance. More than 4,700 acres of these soils are found within the town, and they now primarily support forest growth. Wilton's better agricultural soils are much more limited. Only 893 acres of prime agricultural soil, and 703 acres of soils of statewide importance are present. Combined, they amount to only 10% of the town's total land area, but this is well above the statewide average of 5.6%. It is important to note, however, that these critical food and fiber growing soils are

in very short supply. Only 132 acres (15%) of Wilton's prime agricultural soil, and only 82 acres (12%) of its soils of statewide importance are currently protected.

Agriculture & Open Lands

While classification for soil productivity may indicate agriculture's relative potential and value, farming as a way of life in New Hampshire has been on the wane since the mid-1800s. In many places, very productive farming soils are now growing trees and houses, not crops. Therefore, it is important to recognize the historic and cultural value of those farming and agricultural enterprises still operating on good soils within our communities.

Wilton's agricultural landscape is largely historical. Remnant orchards are still found in the southwest and northeast quarters of town, a testament to the much more widespread apple industry once prevalent in southern N.H. towns. Though some pastures and meadows are still utilized for hay and occasional grazing, intensive crop production is no longer common. Those areas that have remained open are generally indicative of the fertile soils they contain. As described later, these open grasslands are also a critical and scarce wildlife habitat type in the state.



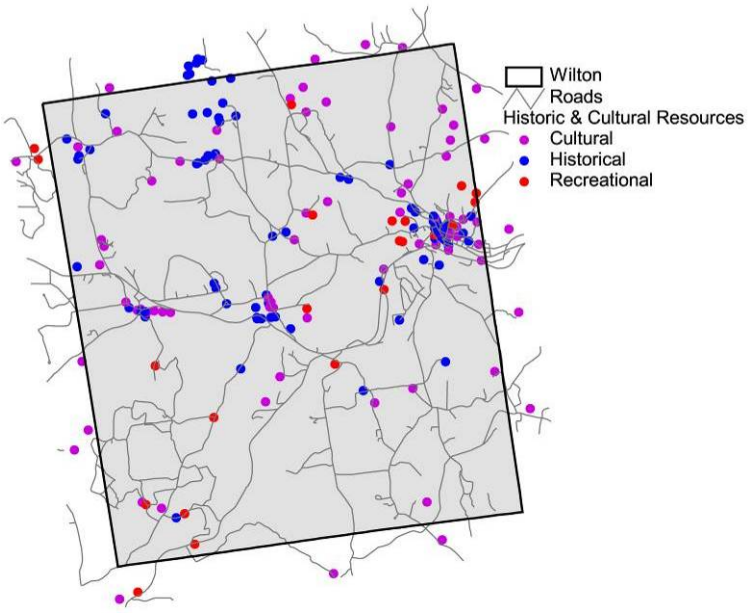
In order to better identify these open lands, volunteers from the WCC made field investigations and used aerial photos to delineate the orchards, cropland, meadows, pastures, and other open lands. They were categorized as agricultural, other open lands, or gravel pits, which also function as special wildlife habitat. Other data such as current use or additional special attributes were also documented.

Actively farmed lands and other open agricultural lands are shown on the map to the left. There are only 1,335 acres of this land type in Wilton, representing about 8% of the town's total land base. Approximately 254 acres (19%) of this type is currently protected.

Recreation Resources

As part of this study of natural resources of conservation value in the town of Wilton, a reference dataset was also generated for a variety of important historic and cultural features in town that are notable from a preservation standpoint, and which may amplify strategic conservation planning of natural resource values where they co-occur. An inventory of historic and cultural resources was developed from public GIS data available from the GRANIT system and the NH Office of Energy and Planning, as well as features identified by members of the WCC and the Hieritage Commission. Locations of all features were initially identified by mark-up on a base map of the town, and were then confirmed in most cases on 2003 aerial imagery and digitized by Forest Society staff for use in GIS mapping in this study.

A total of 139 features (points) were mapped and indexed in tables on the *Historic and Cultural Resources* map. Features were classified among three groups or types: historic, cultural, and recreational. Historic features include 64 locations, and include historic buildings and sites in town, cemeteries, dams, commemorative markers, bridges, and libraries. Cultural features total 53 locations, and include settlements, other town buildings, schools, hill summits, gravel pits, and dams. Recreational features were also mapped, and total 22 features including camps, canoe portages, beaches, field sports, fishing sites, and several trailheads. The Souhegan River provides whitewater activities.



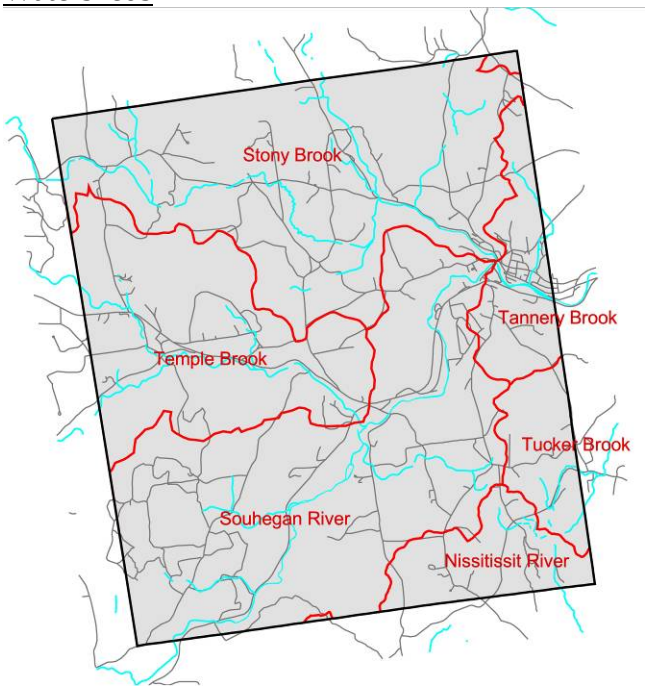
These features are fairly well distributed geographically around town, with a significant cluster in the village of Wilton, and smaller clusters in Wilton Center, West Wilton, and Davisville. A few sites just outside the town boundary were included in the mapping due to local recreational use or as cultural features recognized as important to the town. The distribution and extent of the three classes of historic and cultural features are shown in the map at the left.

III. WATER RESOURCES

Introduction

Water resources including both surface waters and groundwater resources are some of a community's most valuable assets. Most drinking water sources – whether public or private – depend on subsurface water in sand and gravel aquifers, or in bedrock. Surface waters offer many recreational possibilities, and are key elements in the value of scenic resources. Floodplains provide fertile farming soils, and are also valuable in attenuating damaging floods. Wetlands are well-known for diverse wildlife habitat values, flood storage, and water filtering values. All of these aspects of Wilton's water resources are considered in this NRI.

Watersheds



It is common in conservation planning today to think in terms of "watershed address", which implies evaluating resources and conservation priorities in terms of ecosystem dynamics. While this NRI is not intended to develop information for any particular watershed, a look at the major tributary basins that affect Wilton is important in terms of the natural, watershed-based "planning zones" that become apparent.

The Temple Brook watershed (~3,100 acres), named after a brook entering the town from Temple near West Wilton feeds into the town's most significant watercourse, the Souhegan River (~5,630 acres). The Souhegan River is a State of New Hampshire Protected River under RSA 483. Blood Brook also is part of this watershed. The Stony Brook watershed (~5,045 acres) to the north is second largest and flows south from Lyndeborough. Together, with many smaller brooks, the Temple Brook and Stony Brook watersheds drain about 85% of the town's land area into the Souhegan River watershed. The Tucker Brook feeds into the Souhegan River watershed further downstream in the town of Milford. The Nissitissit River is part of the Nashua River watershed and drains to the south.

Three other watersheds – Purgatory Brook, Beaver Brook and the Nissitissit River headwaters – flank the eastern edge of town, and all drain eastwards, and total about 2,670 acres.

Surface Water & Shoreline

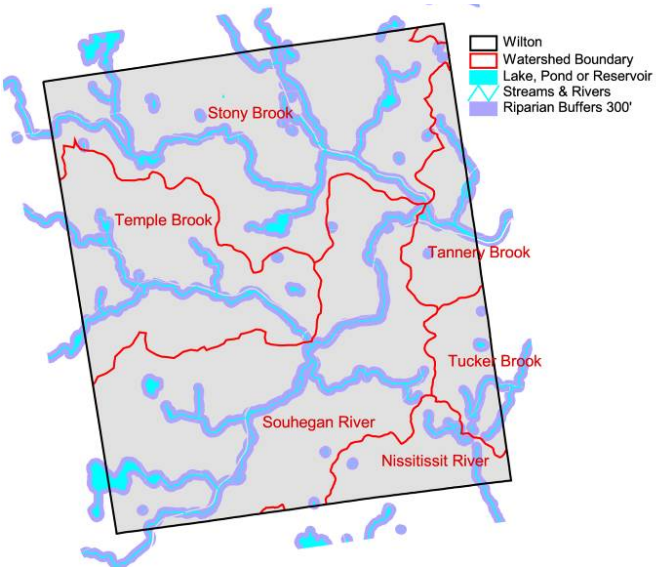
Wilton's principal surface water feature is the Souhegan River. Entering town from Greenville to the southwest, it flows northeasterly for 7.4 miles before exiting into Milford. The principal tributaries

of the Souhegan River are the Blood Brook and Stony Brook flowing out of Temple and Lyndeborough, respectively. These perennial streams, and a few others not named, total nearly 40 miles[5] of tributary waters flowing into the Souhegan River. The water quality in those streams directly affects the Souhegan River and its natural resource values.

In contrast to the brooks flowing out of the steep terrain to the north and south, the Souhegan River is a low-energy, slower-moving water body over much of its course, typical of glacial outwash plains in New Hampshire. In places, the river is typically faster, with short rapids and riffles on stone bottoms and slower flatwater stretches between. Both the rapids and riffles, and the slower backwaters and associated floodplain swamps, are important water features, especially in terms of wildlife habitat, and are therefore of special value in conservation planning.

In addition to the Souhegan River, Wilton contains four principal water impoundments: the Heald Flood Control Site 15, Dale Street Flood Control Site 33, the New Reservoir, and Batchelder Pond. There are several other small unnamed ponds also found scattered around town. In contrast of many other communities in New Hampshire, Wilton hosts no large lake; this makes its complement of smaller waterbodies all the more special.

Riparian & Shoreland Zones



Stream networks and shoreline areas function as critical wildlife corridors and/or serve a number of habitat functions for wildlife. Shorelines offer multiple human benefits as well, including aesthetic enjoyment and recreational activities. The Souhegan River has approximately 15 miles of protected shoreline as does a section of Stony Brook to the confluence of Mill Brook. The several ponds mentioned above and a number of other, small waterbodies mapped by USGS contribute another 68,200 feet of shoreline. Land use and development within 250 feet of shoreline areas for those sites listed with the DES are regulated by the Comprehensive Shoreland Protection Act in New Hampshire[6]. These water bodies total about 15,700 feet of shoreline, currently almost totally undeveloped.

Surface water features and associated buffer zones are shown in the map above. Watershed boundaries are also shown to give a sense of relative importance of the riparian and shoreland networks.

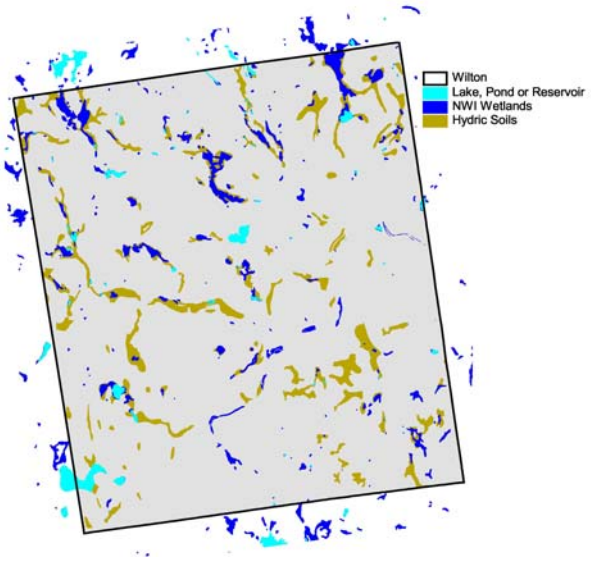
[5] Calculated from the USGS National Hydrography Dataset, 2006.
[6] The NH Comprehensive Shoreland Protection Act (CSPA), RSA 483-B, became effective 7/1/94 and established the "protected shoreland." The protected shoreland is all the land located within 250 feet of the "reference line" of public waters. The CSPA was recently updated with more stringent regulations, and will become effective July 1, 2008.

For this study, a riparian and shoreland buffer zone has been established around all perennial watercourses (brooks, streams, rivers) as well as ponds and lakes. The buffer zone extends 300 feet on both sides of a stream, or back from shorelines along rivers, lakes and ponds. This distance is well established in the scientific literature as a sound working minimum distance within which natural land cover should be maintained in order to effectively function as a wildlife corridor, maintain habitat quality, and act as a filter for soil erosion and stream sedimentation.

Wilton has about 2,790 acres of riparian buffer zone along its streams and water bodies. Nearly 572 acres or about 20% of riparian zone is currently protected. Given the well-documented and critical role of these buffers in protecting water quality, more protection is warranted.

Wetlands

Currently, the primary data source for wetlands mapping is the National Wetlands Inventory (NWI). It is based on delineations completed by the US Fish and Wildlife Service using aerial photography. While some minor inaccuracies are known to exist in these data, they continue to serve as the baseline reference in locating wetlands. NWI maps contain only those wetlands visible on aerial photography. Additional jurisdictional wetlands can be found by including areas of poorly- and very poorly-drained soils (hydric soils).



The map at the right shows wetlands in blue and hydric soils in greenish-brown. Note that NWI mapping includes ponds and lakes. Wilton contains approximately 1,489 acres of combined wetland and hydric soils, representing 9% of the town's total area. Only 22% of these wetlands and hydric soils are currently protected.

Further discussion on significant wetlands mapped as habitat complexes and features can be found in the *NH Wildlife Action Plan* in **Section III** below.

Sand & Gravel Aquifer

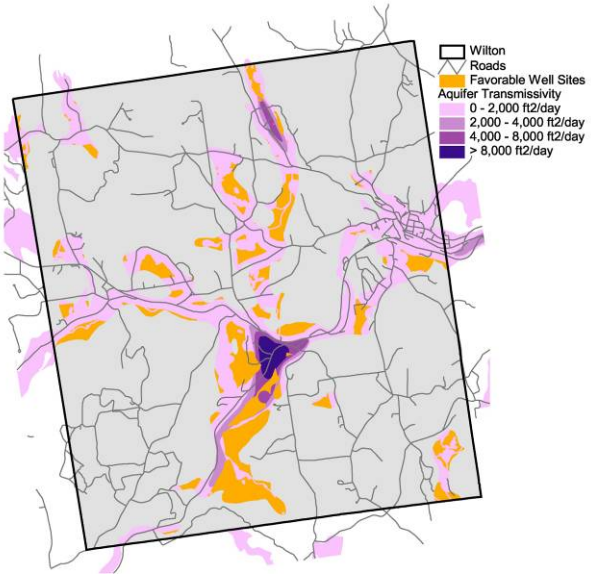
An extensive aquifer of sand and gravel layers known as a stratified drift formation underlies the entire Souhegan River, Blood Brook and Stony Brook floodplains. These formations are important statewide groundwater resources, supplying much of the municipal drinking water to people who depend on public water supplies.

Wilton contains nearly 3,370 acres of sand and gravel aquifer, representing nearly 21% of the town's total land area. While this is a significant fraction compared to many other upland NH communities, a large portion has already been disturbed as historical settlement patterns, roads, and more recent land use trends such as gravel extraction have utilized the Souhegan River valley and the Stony Brook floodplain. This development, including nearly 6 miles of the Route 101 corridor, more than

three miles of Route 31, the Wilton village district itself, and extensive gravel mines along both the Souhegan River and Stony Brook, have all disturbed the aquifer's natural state and increased it susceptibility to adverse water quality impacts.

Of the 3,370 acres of aquifer, around 89% of that area is classed as potentially low yield, or marginally suitable for municipal water supply development. That leaves 380 acres of higher yielding aquifer. However, that portion of the aquifer functions as primary recharge zone for the higher yielding areas of the aquifer, generally located in deeper "pools" within the aquifer structure. One significant "pool" exists at the confluence of the Souhegan River and Blood Brook.

Only limited areas within an aquifer are appropriate for the development of public water supplies due to land use constraints and contamination risks. NHDES identifies these areas as "favorable gravel well sites". While Wilton's aquifer zone is sizeable, the actual area potentially suitable for future water supply development is only 912 acres, or about 27% of the total aquifer surface area. As development proceeds on or near the aquifer, the area for future water supply will be further diminished. Note, too, that most of the potential well sites occur on the lighter pink, marginal portions of the aquifer.



The map at left shows the aquifer with darker colors indicating more groundwater availability. The small orange areas are the remaining favorable gravel well sites.

Very little of Wilton's groundwater resources are currently protected. A little more than 670 acres (20%) of the total aquifer area, and 270 acres (30%) within the area designated suitable for municipal water supply development are now protected.

Development on the aquifer, or within its immediate recharge zone has the potential to degrade water quality through contamination or reduce water availability through rapid runoff and diminished infiltration into the aquifer. Therefore, protection of these potential well sites should be a priority in the community's conservation plan.

Water Supply Infrastructure

Seventeen public water supply sources, seven with delineated drinking water protection areas, are recognized by NHDES within the town. Four wellheads are the community water sources, all associated with the Wilton Water Works; two of these water supplies have inactive sources, leaving only the two wells in the Souhegan River valley along Route 31 as active and currently provided water supply to 1,665 persons of around 650,000 gallons per day.

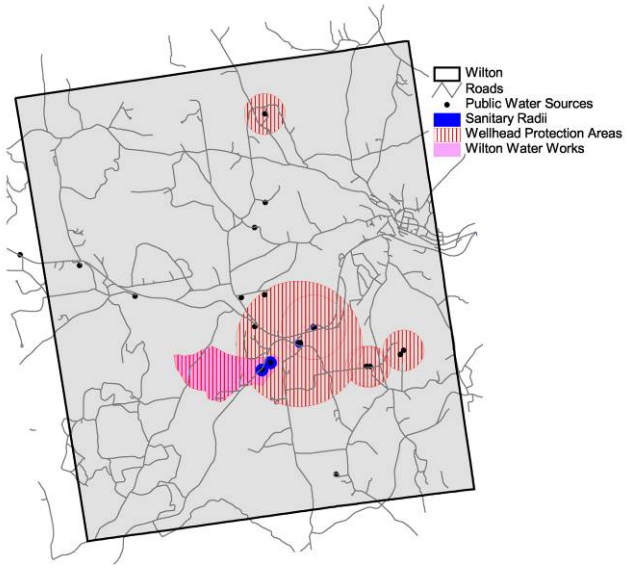
Several other sites serving the public also exist in town, including two wells at High Mowing School serving 140 persons, another two wells at the Pine Hill Waldorf School serving 190 persons, and a

well at the Pep Direct, Inc. facility serving 415 persons. In addition, Monadnock Mountain Spring Water Company operates three water sources (two of which are actually springs); no data on population served are available, but the operation is listed as using up to 100,000 gallons of water per day.

There are five other wells in the DES data base serving the public, but on a more transient basis. These include the Brookside Mini Mart, Camp Anne Jackson, the Harvest Restaurant, and the Pony Farm Horse Camp.

Seven public water supply protection areas have an officially delineated protection zone around their wellhead(s), as well as a smaller sanitary radius. These protection zones represent the best judgment of DES hydrologists relative to the land area over each well's draw-down zone. These drinking water protection areas are under constant study and refinement, but the default zone is a 4,000-foot radius around the water source. The map below shows one of these large circles surrounding the Monadnock Mountain Spring Water Company's main water source. It is important to note here that the best way to protect groundwater quality is to maximize the natural land cover within these protection areas. About 1,740 acres of drinking water protection zones exist in Wilton, but only 13%, or 222 acres are currently protected.

By far Wilton's most important water resources are the Wilton Water Works water supply wells located along the Souhegan River (see pink zone in the map to right). These high-yield gravel wells lie in the sand and gravel aquifer along the river, and have a large, 312-acre drinking water protection zone delineated by NHDES to signal the need to protect the area up-aquifer affected by the well intake operation. Note in this case that the DES has delineated this drinking water protection area based on a study of surface watersheds and sub-surface aquifer information. Only 96 acres, or about 30% of that area is currently town-owned or permanently protected. Fortunately, a large area immediately surrounding the wells is under town control. Because this drinking water protection area is situated near Route 31 and its existing and future development corridor, its protection should be a top priority of the town.

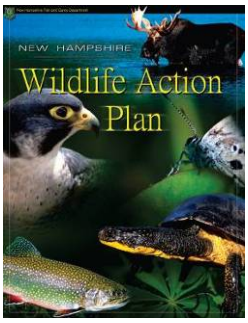


The DES requires a sanitary radius around each public water supply wellhead, ranging from 150' to 400' depending upon rate of use and population served; the area within the sanitary radius is mandated by law to be kept in a natural land cover condition. Each of the seventeen water sources in town has a sanitary radius, with a total acreage in town of about 54 acres. Of that nearly 25 acres are protected. Most of that protection is due to the prudence of the town of Wilton which has protected the 400' radius around its wells near Route 31. In contrast, none of the sanitary radius zones around the Monadnock Mountain Spring water sources is permanently protected. Given that the town's main water supply wells are located within the Monadnock Mountain Spring drinking water protection

area, which has virtually no resource protection except by the town's efforts, a public/private partnership to see more land permanently protected for water supply purposes may be a worthy project for the WCC

IV. WILDLIFE HABITAT

Introduction



When planning the Wilton NRI, specific GIS-based plant and animal habitat data were unavailable. Therefore, it was proposed to evaluate Wilton's wildlife habitat by analyzing those basic structural environmental factors important to wildlife such as: large forest blocks, riparian corridors, wetlands, and steep slope areas. Since then, however, a great deal of statewide information became available when the NH Fish and Game Department released its Wildlife Action Plan (WAP) in August, 2006 [7].

An analysis was made of the various wildlife habitat factors originally selected for use in the Wilton NRI, and recommendations were made by Forest Society staff for an updated suite of habitat types to be considered in the NRI. These are defined in the Habitat Features section below. A following section also briefly describes the other major working components of the WAP that are of use to the Wilton NRI: WAP regional scale habitat quality rankings. The WCC is also encouraged to watch for updates of the WAP data for incorporation into its conservation planning; a new set of data are expected to be released in the summer of 2009 by the NH Fish and Game Department.

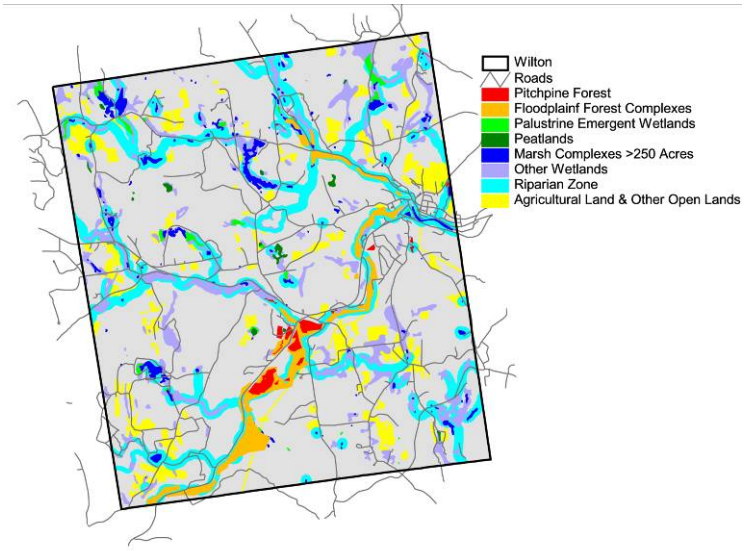
It is important to note that the habitat features developed by the WAP and used in this study are predictive, and may not reflect actual on-the-ground features. *The reason for this is that the modeling processes used in the WAP draw on many natural resource factors – soils, slope, solar aspect, vegetation, etc. – to identify those areas with high potential to harbor the types of habitats mapped. In most cases, the natural communities indicative of the habitats will actually be found in those locations; however, the exact extent and distribution of patches may not match existing field conditions. Only careful field reconnaissance can determine the actual location and extent of natural communities and habitat features, and this was not within the practical scope of the WAP. On the other hand, natural resource inventories and town conservation plans can and often do invest in this level of detail.*

Habitat Features

Three suites of wildlife habitat features were generated for this NRI: priority wetlands, priority forests, and agricultural and other open lands. In the priority wetlands suite, two habitat types from the NH WAP were included with the other wetlands data detailed above under *Water Resources*; these include the marsh complexes greater than 250 acres combined, and the peatlands dataset. In the priority forests suite, another two WAP habitat types were mapped: pitchpine forests and floodplain forests. The agricultural and open lands data are discussed earlier in this report under *Agricultural Resources*, and have been used in this NRI in place of the WAP grasslands dataset due to better accuracy and feature typing done by the WCC as part of this study.

[7] Refer to the N.H. Wildlife Action Plan report for details on this plan.

The map to the right shows the mosaic of these three priority habitat suites across town in a somewhat simplified form. Full detail is available on the large format mapping also done as part of this project. Note also, that in several cases, some features co-exist or overlap on top of other features. Hence, peatlands and palustrine marshes are found within the larger framework of all wetlands in town, and floodplain forests include pitchpine forest on dry, sandy outwash soils, as found along the Souhegan River valley.



The following excerpts from the WAP give a thumbnail sketch of the character and importance of each of the habitat features mapped.

Floodplain Forest Complexes: Floodplain forests occur in valleys adjacent to river channels, are prone to periodic flooding, and support diverse natural communities. They also protect and enhance water quality by filtering and sequestering pollution and erosion sediments. Extensive floodplain forest communities exist along the Souhegan River along Route 31.

Pitchpine Forests: Pine barrens are among the most imperiled natural communities in the world, and contribute significantly to the biological diversity of the northeast. They are dominated by pitchpine and scrub oak interspersed with pockets of grassy openings. Pine barrens plants are in constant flux, maintained by frequent wildfires, which occur naturally and regularly. These communities support a suite of regionally and globally rare species. These forests are found in Wilton along the Souhegan River in the south central part of town.

Marsh Complexes: Emergent marsh, wet meadows and shrub swamp systems are important food sources for many species, and perform many flood control and water quality services. These complexes are found throughout town associated with valley drainage systems.

Peatland Complexes: Peatlands have water with low nutrient content and higher acidity cause by limited runoff and groundwater input. Eleven different natural communities are associated with peatlands. Several small peatlands occur in central Wilton, but atypically, not within other wetland types or complexes.

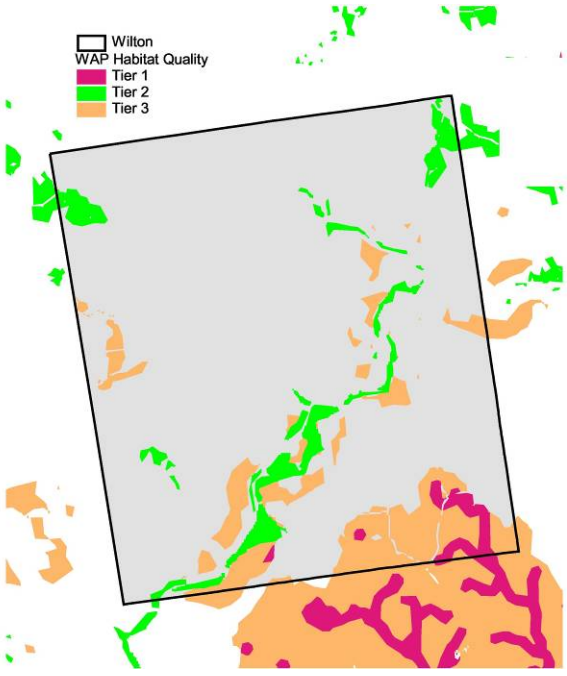
Grasslands: Grasslands are dominated by grasses, wildflowers, and sedges with little or no shrub or tree cover. Wilton's many hayfields, pastures, and croplands all are considered as grassland habitat. Grasslands account for only 4% of New Hampshire's land base, and are a habitat type of special concern statewide. *Note: This dataset is not taken from the WAP data library; rather, it is a more comprehensive product of mapping and delineation by WCC volunteers.*

The total acreages of the habitat types mapped in this NRI, and the acres and percent of protection are shown in the table below. Some of the habitats, such as floodplain forests, pitchpine forests, and palustrine wetlands are fairly well protected, by percent land area. Riparian zones and agriculture/open space (equivalent to WAP grasslands) are less protected. The peatland component, while relatively minor in total acreage town-wide, is not well protected; given the many natural communities and species supported on this habitat type, peatlands might be elevated as a priority conservation target. And even though the protection percentage of several habitat types is relatively high, only a careful study of habitat quality in each type would reveal whether or not the best examples of each type is currently well-protected.

Habitat Type	Total Acreage	Protected Acres	Percent Protected
Pitchpine Forest	93	25	27%
Floodplain Forest Complexes	485	201	41%
Palustrine Emergent Wetlands	80	23	29%
Marsh Complexes	327	83	25%
Peatland	32	3	9%
Riparian Zones	2,786	572	20%
Agriculture & Other Open Space	1,335	254	19%

Regional Scale Habitat

The WAP also evaluated habitat resources and condition at landscape scale to develop a statewide and regional ranking, and to identify the highest condition habitat relative to all instances of a given habitat type in the state. The results of this analysis provide regional and local conservation planners a means to identify the most critical wildlife habitat locations. Tiers of habitat quality were assigned based on an intensive statewide analysis, as follows:



- **Tier 1** rating was given to areas that contain the highest condition habitat in the state.
- **Tier 2** areas contain the highest condition rank in the biological region (defined by eco-region for terrestrial habitats, and watershed for wetland and aquatic habitats).
- **Tier 3** includes supporting landscapes such as watersheds containing top-ranked stream networks and lakes, large forest blocks, or specific animal, plant and natural community occurrences of special note.

Wilton is home to several significant areas of high habitat quality according to the WAP, but these are typically small in area and somewhat scattered across

town. A limited area of Tier 1 habitat is found in the Mitchell Brook and Spaulding Brook riparian areas to the south, extending into Mason, Milford, and Brookline. This Tier 1 aquatic habitat network is buffered by a very large Tier 3 supporting landscape that corresponds to the watershed boundaries for those streams, and is associated with the large, intact forest block mentioned in the section on forest blocks above.

The Souhegan River valley is ranked Tier 2, indicating regional importance, and has several associated Tier 3 supporting landscapes, as can be seen in the map to the left. Other Tier 2 areas are found in the northeast corner of town, associated with Pead Hill and Whiting Hill, and in the northwest corner above Blood Brook.

All three WAP habitat tiers total only 2,414 acres in town, or about 15% of the town land area. Tier 1 habitats total about 195 acres, Tier 2 about 717 acres, and Tier 3 supporting landscapes are a majority at 1,502 acres. About 29% of this total acreage is currently protected. Tier 1 habitats are better protected, percentage-wise, than the other two tiers at 46%; Tier 2 habitats are about 29% protected, and Tier 3 with the most acreage is only 27% protected. Given the relative scarcity of these highly ranked WAP habitats in town, and the incomplete protection, the town may want to elevate the priority of these locations in its conservation plan.

WAP Updates

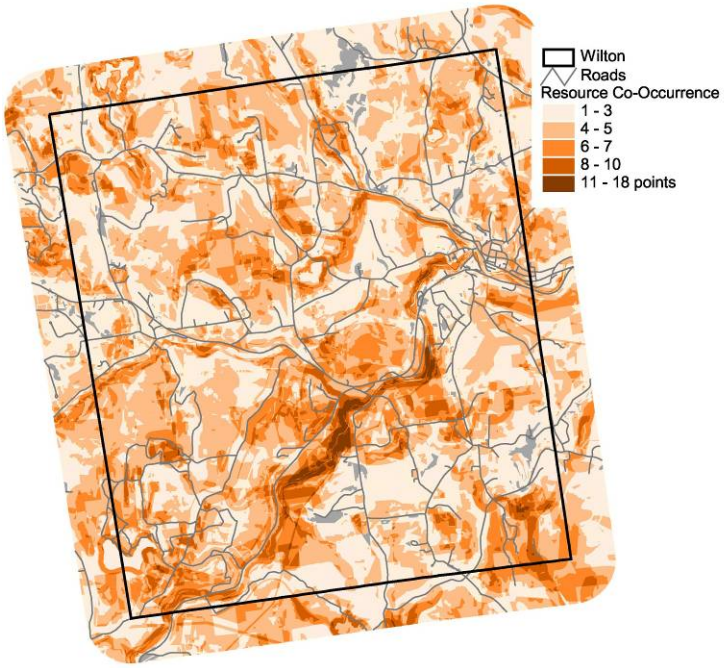
An important note about WAP data should be made in this report. As with all science-based conservation planning data, the WAP is in a constant state of revision in terms of availability of new and better data, as well as improved modeling techniques. The N.H. Fish and Game Department recently announced that a new release of public data is pending for 2009. This will include upgraded habitat quality tier rankings, discussed above. The WCC is encouraged to incorporate the results of that new data release into this NRI and forthcoming conservation planning.

SECTION V

Resource Co-Occurrence Model

A ***resource co-occurrence model*** assigns a weighted importance value to each data factor or layer. Each layer representing a particular data factor from the table above is converted in the GIS to a grid with a cell resolution of 30 meters (about a quarter acre in size). The grids are then spatially superimposed with each other, so that all locations align as in the diagram at the right. Each cell is given a value of (1), and then all the factors are added together layer by layer in the GIS to arrive at an arithmetic sum of the value of all cells co-incident in each grid. The result is displayed as a color gradient where light hues represent the lowest number of co-incident factors and dark hues represent the highest.

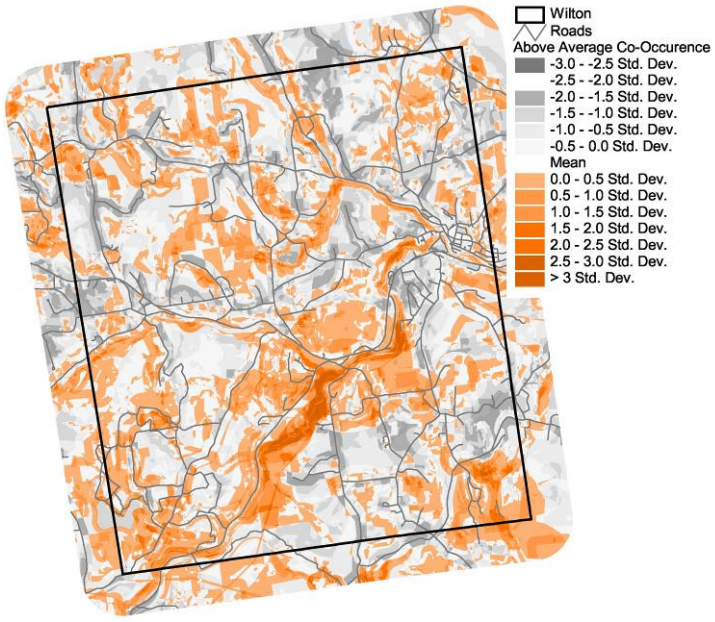
Determining the weighted values is an important process. In some co-occurrence models, a team of scientific experts rates and ranks each factor, with an emphasis on mathematic modeling and statistical analysis. Because public involvement and the planning process are important, as with the Wilton NRI, a "shared vision" of relative values was generated by the WCC with guidance from Forest Society staff. By reviewing all the mapped data, both natural resources and scenic resources, a list of 29 individual data factors, or data layers, was generated. In some cases, an individual data factor may represent a class or subset of the data, e.g., acreage of forest blocks, or various levels of viewshed importance. Each data factor was assigned an integer value of 1 or 2 points, so the GIS analysis used a relatively simple arithmetic approach, versus more complicated multiplier factors sometimes used.

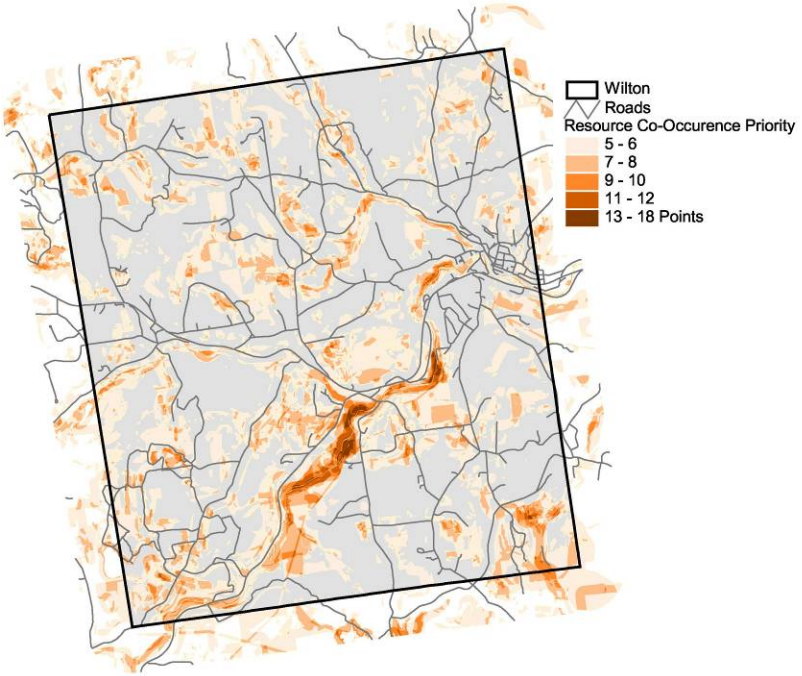


The map to the left displays the results of the resource co-occurrence modeling. There are many ways to display the range of values in such maps; the data in this map are classified using a "natural breaks" statistical analysis in the GIS that identifies natural grouping of grid cell values. As can be seen in the map legend, the steps between groups are relatively regular until the higher values are reached where there is a grouping of all cells from 11 to 18 points. There are many fewer of these higher scoring cells in the map, so the resulting color scheme works to reveal the spatial patterns of higher conservation values. Note especially the darker colors in the Souhegan River valley and in the southeast corner of town. In contrast, many areas in town show only lower values and lighter colors. That does not mean there are no conservation or wildlife

habitat values within those areas; what we see in the map is merely a reflection of how the WCC decided to assign relative values to the factors considered in this study. This is an important distinction. Revisiting the scoring scheme in the future with better resource data and/or field science would probably result in a different map, and conservation priorities.

Another way present the same data is by classification according to standard deviation. This is a statistical technique translated into GIS that shows the *average value* of all data, as well as the lowest values and the highest values, represented with a two-color gradient. The average value here is a little less than 5, within a range of 1 to 18 points in scoring cells. The higher the scores rise, though, the fewer grid cells occur, so the average is driven down. As can be seen, the orange color gradient represents the above average scores across all 29 datalayers, while the gray tones descend down to the lowest scores. White in this map equal a "0" score. This map is useful to quickly identify where the "best of the best" resources are found, and how well they are protected.





Taking the classification process one more step helps to highlight the extent and distribution of the higher scoring areas, with higher conservation value to the WCC. In the map at the left only scores 5 and above are shown, i.e., only scores above average are depicted. The natural breaks analysis method mentioned above is used here to color code the scoring scheme. Note again how important the Souhegan River valley appears. The total acreage of all land area with a score of 5 or greater is a little more than 6,000 acres, or about 37% of the town.

Interpretation

The table below breaks down the values from 5 to 18 in terms of acreage and extent of resource protection. As can be seen in the numbers the higher the scores, the smaller the land area involved; so small, in fact, that perhaps values of 15 to 18 might be set aside as too limited to be important to a town-wide conservation plan. The mid-range of the scores might be the best target for conservation priorities in a time of scarce funding for land protection. However, large-scale land protection projects that encompass extensive areas of the lower third of scores might also be prioritized.

Co-Occurrence Score	Total Acres	Percent of Town	Acres Protected	Percent Protected
5	2,521	15.5%	623	24.7%
6	1,715	10.5%	544	31.7%
7	926	5.7%	154	16.6%
8	492	3.0%	86	17.5%
9	208	1.3%	43	20.7%
10	88	0.5%	23	26.1%
11	46	0.3%	15	32.6%
12	36	0.2%	10	27.8%
13	16	0.1%	3	18.8%
14	7	0.04%	2	28.6%
15	3	0.02%	<1	nil
16	2	0.01%	<1	nil
17	<1	nil	<1	nil
18	<1	nil	<1	nil

V. SCENIC RESOURCES

Introduction

Scenic assessments are often thought of as subjective (beauty is in the eye of the beholder), and thus not compatible with the typical suite of natural resources that are mapped, measured, and evaluated in most natural resource inventories. However, to the extent that our experience of place, and therefore our quality of life, depends upon the physical features of the land – the forests, hills, lakes, ponds, and wildlife – aesthetic considerations are strongly linked to conservation.

The key point is that the natural landscape features and the terrain of Wilton are dramatic in and of themselves. The valleys of the Souhegan River, Blood Brook and Stony Brook contrast with the rising topography on either side of the valley, lending a strong, structural "sense of place" and spatial continuity to the town. In turn, they all lead to the Wilton village district with its historic character and charm.

This type of well-defined but spatially complex landscape is relatively uncommon in New Hampshire, and thus represents a visual resource that has value beyond the town itself. It is shared by neighboring towns and travelers alike. Imagine the Souhegan River valley without its river or the Wilton village center. Something vital is lost in the experience and quality of the place. Fill the valleys with developed land uses, and Wilton becomes something different.

In contrast, the forested slopes of the valley provide a very definite containment of the valley that is wild and unsettled, thus magnifying the contrast. The skyline ridges to the north and south are especially important scenic resources to the town. Imagine these ridgelines and slopes with extensive new residential development, and the sense of Wilton again changes.

Therefore, in setting conservation goals for the town, development of the valley floor and the valley walls is as important as considering the need to protect water quality or wildlife habitat.

Methods

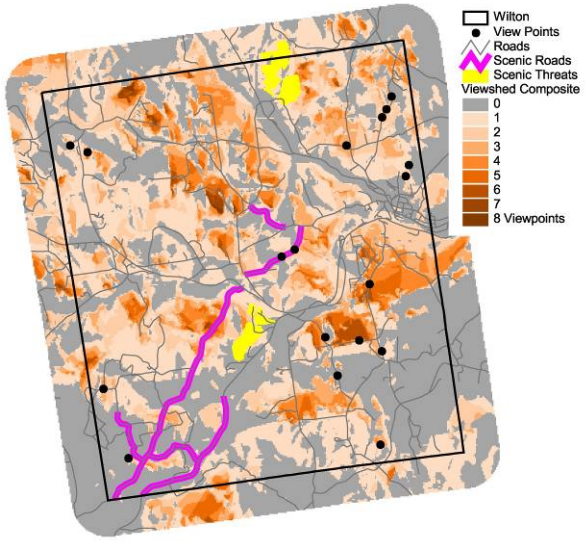
The Wilton NRI scenic resources assessment was conducted as a team effort between members of the WCC and the Forest Society. Based on a proven GIS methodology used in other NRI efforts in N.H., volunteers were provided with base maps of the town upon which to record important viewpoints and vistas, including the direction and azimuth limits of each view. These points were typically found along town roads where open lands allow a vista. Key locations included Pead Hill; Boy Scout Outlook at Carnival Hill; points along Wilson Road, Abbott Hill Road and Gage Road; the Frye Farm and Field; Four Corners Farm; Abbott Hill; the Heald Tract and Kimball Heights in the southwest part of town.

A database of 18 points was thus developed, which was then fed into a GIS modeling routine that determined those "viewsheds" in the town that shared the most viewpoints. This model used a digital elevation model to calculate what could and could not be seen by line of sight from each viewpoint. Note that this was done without regard to vegetation, which screens or sometimes filters views. To a

great extent, the selection of the viewpoint on the ground and determination of the azimuth (viewing angle) compensated for the raw elevation data.

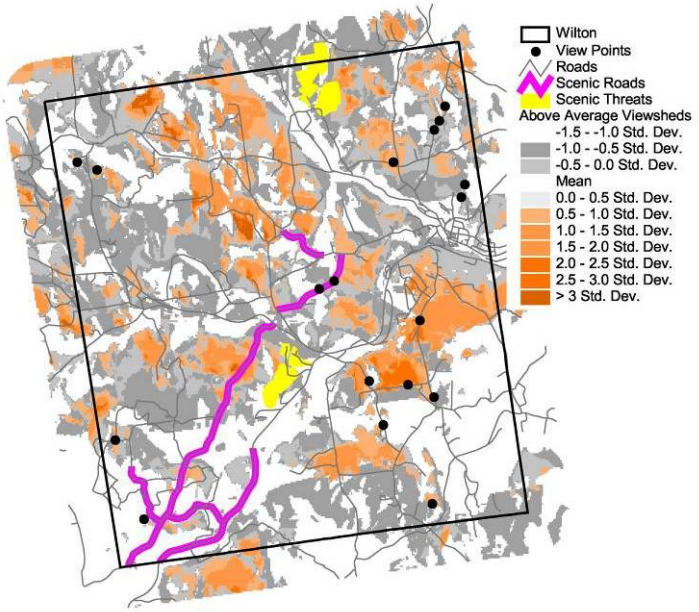
Designated scenic roads in Wilton, and important foreground areas associated with hay meadows and other open lands were also mapped and comprise two of the viewpoints along Wilson Road.

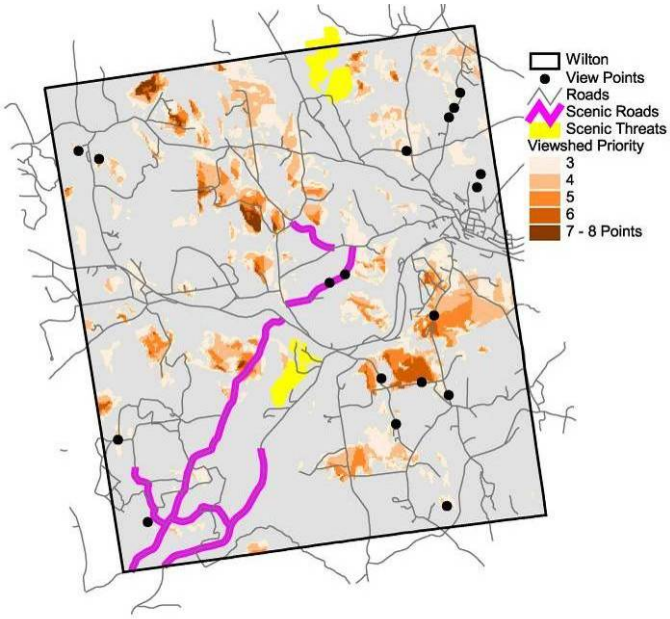
The net result was a co-occurrence map similar to the one described for the resource factors above. The darker colors show those places in town that are viewed from multiple viewpoints, and are thus more important to preserve from the standpoint of scenic quality. Two key areas stand out: the entire Abbott Hill "range" obviously serves as an important backdrop for many views whether in the valley or on the rising terrain south of the village district; and the high ground surrounding Wilton Center in the north central part of town.



Note in the map two areas colored yellow. These are large, operating gravel mines identified by the WCC as "scenic threats". While they do not coincide strongly with high-scoring portions of the composite viewshed analysis, the land disturbance is visible at times along town roads and in the neighborhood of these operations, and has been classified as a negative factor in this NRI.

Following suit with the refinement of the resource co-occurrence map discussed above, the viewshed scores can be further processed using the standard deviation method to help zero in on the most important viewshed areas, as shown in the map to the right. Dropping out all below average scores results in the map below.





VI. RECOMMENDATIONS

It should be clear from the results of the NRI study presented here that Wilton possesses abundant and diverse natural resources that contribute significantly to both the ecological richness and health of the town, as well as socially to its quality of life for its townspeople. This NRI is not and should not be viewed as a conservation plan of action. Rather, it is an encyclopedia of information based on the best currently available data, with a measure of interpretation and some initial recommendations about what is important to conserve. The NRI is a baseline characterization, and a beginning in what should be an ongoing process of updating and refinements. More work lies ahead for both the WCC, and the Wilton Planning Board.

Next Steps

1. A commitment should be made to transforming the NRI information and interpretation into a policy-related, strategic conservation plan for the town. This work would include, but not be limited to:

- Refining selected data, e.g., the WAP natural community delineations that are based on potential, not actual existence of habitat.
- Developing a more precise list of key factors to be included in a conservation plan; for example, historical and cultural features not included in the NRI, by definition.
- Broadening the stakeholder group beyond the WCC to include representatives from other boards in town, as well as knowledgeable professionals and persons with special information to bring into the discussion.
- Generate a true, "shared vision" of the town's conservation plan by using a facilitated consensus-building process to assign relative importance values to key factors, as with the wildlife co-occurrence mapping exercise described above. This will serve to integrate all data into a single "road map" for conservation, including work already done on forest and agricultural resources, and the scenic assessment.
- Analyze the results of the master resource co-occurrence mapping quantitatively and qualitatively to identify the highest-value conservation focus areas in town in which to move forward to protect land with scarce dollars.
- Investigate opportunities to enhance connectivity among key natural areas and along riparian and shoreland corridors.

2. A well-crafted public information plan will be needed to keep townspeople apprised of the planning process, opportunities to become involved or learn more about the plan, and most important, to interpret and build voter support for the strategies within the plan. This work would include, at a minimum:

- Announcement and notice of the commitment to create the conservation plan in various local media, including the town website.
- Periodic public information sessions to allow people to enter into the planning process along the way.
- Means of contacting key WCC members and/or volunteers in the stakeholder group to get questions answered.

- Collaborative, joint sessions with the WCC, the Wilton Heritage Commission and the Wilton Planning Board, especially as action items emerge in the planning process that need to be reflected in town land use regulations.
- Maps and posters displayed at Town Hall for convenient viewing, and electronically on the town website.

End

Appendix A: Summary statistics on natural resources

Summary of Statistics for Key Natural Resources in the Town of Wilton, April 2009				
Natural Resource Factor	**Acres in Wilton**	**Percent Wilton Land Base**	**Acres Protected**	**Percent Protected**
Forest Cover	12,690	36.2%	2,710	21.4%
Forest Blocks 25 - 300 acres	1,913	11.8%	235	12.3%
Forest Blocks 300 - 700 acres	2,771	17.0%	264	9.5%
Forest Blocks 700 - 1,900 acres	2,968	18.2%	806	27.2%
Forest Blocks 1,900 - 3,100 acres	1,656	10.2%	897	54.2%
Forest Blocks >3,100	416	2.6%	214	51.4%
(See text for acre classification method)				
Productive Forest Soils				
1A Soils -- Prime Northern Hardwoods Sites	4,575	28.1%	842	18.4%
1B Soils -- Prime Red Oak Sites	5,549	34.1%	672	12.1%
1C Soils -- Prime White Pine Sites	1,767	10.9%	335	19.0%
Total of Productive Forest Soils	11,891	73.1%	1,849	15.5%
Agriculture				
Prime Agricultural Soils	892	5.5%	132	14.8%
Soils of Statewide Importance to Agriculture	703	4.3%	82	11.7%
Active Farmland	1,335	8.2%	254	19.0%
Water Resources				
Wetlands & Hydric Soils	1,489	9.2%	325	21.8%
Riparian & Shoreland Buffers	2,790	17.2%	572	20.5%
Aquifers	3,370	20.7%	670	19.9%
Favorable Municipal Well Sites in Aquifers	912	5.6%	270	29.6%
DES Drinking Water Protection Area	1,740	10.7%	222	12.8%
Wildlife Habitat				
WAP Tier 1: Highest Ranked Statewide	717	4.4%	18	2.5%
WAP Tier 3: Highest Ranked in Bio-region	195	1.2%	5	2.6%
WAP Tier 3: Supporting Landscape	1,502	9.2%	12	0.8%
Special Habitats				
Pitchpine Forest	93	0.6%	25	26.9%
Floodplain Forest Complexes	485	3.0%	201	41.4%
Palustrine Emergent Wetlands	80	0.5%	23	28.8%
Marsh Complexes	327	2.0%	83	25.4%
Peatlands	32	0.2%	3	9.4%
Total of Special Habitats	1,017	6.3%	335	32.9%

Appendix B: GIS Methodology & Data Sources

The methodology behind this project relied to a great extent on the tremendous power and capability of GIS to develop important new datasets and for carrying out the mapping and analysis described in this report. GIS, short for Geographic Information System, is a powerful computer-based system for creating, manipulating, analyzing, and displaying spatial data.

The Forest Society began a formal research program and started to build a computer based GIS in the mid-1990s to enhance its land protection efforts with scientific data and analysis. Much of the work has been in providing hard evidence to support Forest Society policy initiatives, which have led to public-funded, state land protection programs such as the Land and Community Heritage Investment and Water Supply Land Grant Protection programs.

This advanced computing technology not only put the Forest Society in a leadership role in terms of strategic conservation planning in New Hampshire and New England but also fostered a successful program of providing conservation-based GIS services to communities as well as local and regional land trusts. This natural resource inventory for the town of Wilton is one example of such a community-based project.

In addition to the methods developed by Forest Society staff, this study applied many of the items and approaches described in the following two natural resource publications:

- *Natural Resource Inventories:*
  A Guide for New Hampshire Communities and Conservation Groups [8], and

- *Identifying and Protecting New Hampshire's Significant Wildlife Habitat:*
  A Guide for Towns and Conservation Groups [9].

Data Overview

This appendix provides an overview of the data that was applied in this study including a brief summary of the delineation methods that were applied to develop most new datasets. It contains additional source data details including specifics for each data layer such as description, source, derivation method, data dictionary, file names of the corresponding datasets provided in the project CD, and more.

A significant portion of the base data layers applied in this study represent existing digital data that is available from NH GRANIT [10]. Digital data in NH GRANIT represent the efforts of many contributing agencies ranging from state agencies including the department's of Environmental Services, Transportation, and Fish & Game; federal agencies including the United States Geological Survey, USDA Natural Resource Conservation Service, Environmental Protection Agency, and USDA Forest Service; and private organizations such as the Forest Society.

---

[8] Amanda Stone / Phil Auger / Jeanie McIntyre, University of New Hampshire Cooperative Extension, 2001.
[9] John Kanter, Rebecca Suomala, Ellen Snyder; NH Fish & Game, Nongame & Endangered Wildlife Program, 2001
[10] NH GRANIT is based at the University of New Hampshire's Complex Systems Research Center and hosts NH's statewide geographic information system, accessible via their web site http://www.granit.sr.unh.edu/.

In addition to existing digital data, a considerable amount of data development and verification was carried out by the Forest Society (GIS processing and model runs) and the WCC (intensive field work and documentation of viewpoints, vistas, and scenic road features).