Coordinated Review of Land Use Planning Documents with respect to Wildlife Habitat, Natural Resources, and Smart Growth Principles: Gilmanton, NH

January 2011

Prepared by the Lakes Region Planning Commission
and the Audubon Society of New Hampshire Conservation Department
in consultation with the
Gilmanton Town Planner and Gilmanton Planning Board
Support for the project was provided by the Samuel P. Pardoe Foundation

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Introduction

History

"Smart Growth" is a set of planning principles that guide communities toward mixed uses, greater development density in village centers, walkable, involved communities, and a working rural landscape with a healthy environment. The concept of Smart Growth has been around for many years, and in many ways is exemplified by the traditional New England village. In 2003 New Hampshire officially adopted eight Smart Growth Principles. Since 2006 the Lakes Region Planning Commission (LRPC) has been working with local planning boards throughout the region to conduct assessments of their planning documents with respect to these adopted Smart Growth Principles. From 2006 - 2008 these efforts by LRPC were funded through the NH Department of Environmental Resources, Resource and Environmental Protection Program (NH DES REPP).

Historically, New Hampshire has depended on natural resources to support its economy – from agriculture to forest products to tourism. Aquifers, productive soils, flood storage areas, productive forest lands, and high quality wildlife habitat are not distributed evenly across the landscape. As development affects increasing areas of New Hampshire land, it becomes increasingly important to identify and protect the natural resource values on which our economy and quality of life depend.

The N.H. Fish & Game Department completed the State's first Wildlife Action Plan in 2005, with goals of restoring declining species and keeping common species common. Engaging municipalities in this effort is a critical component of the plan, since the vast majority of land use decisions are made at the local level. To that end, the Department contracted with the Audubon Society of New Hampshire (ASNH) and The Jordan Institute in 2007 to develop tools that would aid municipalities in efforts to protect important wildlife habitat and other natural resources. The process for reviewing land use planning documents with respect to wildlife habitat and natural resources is one of the products of that contract. The Jordan Institute has since focused their work on energy-efficient buildings, and ASNH has continued to adapt and apply the review process for communities across the State.

LRPC and ASNH worked collaboratively with the town of Bristol in 2008 and the cities of Franklin and Laconia in 2009 to produce a "Coordinated Review of Land Use Planning Documents with respect to Wildlife Habitat, Natural Resources, and Smart Growth Principles," with funding from NH DES REPP and the Samuel P. Pardoe Foundation. The Samuel P. Pardoe Foundation has funded the entirety of this Smart Growth, Natural Resources, and Wildlife Habitat review for the Town of Gilmanton.

We believe that the smart growth and natural resource reviews complement one another, and provide an efficient and effective road map for improving the municipal planning process. The two tables that immediately follow this introduction illustrate the relationships between the smart growth principles and the habitat and natural resource topics addressed in this document.

Summary of Findings

Most of the statements and recommendations put forth in Gilmanton's Master Plan are consistent with the Smart Growth Principles. The town has implemented some of these recommendations and is actively working on several others. A few of the Master Plan goals seem more remote. Several recommendations resulting from the Smart Growth Assessment identify tools and practices to assist the town in implementing these goals. They include concentrating development in and around the villages, diversifying some of the housing options for the town's residents, increasing the likelihood that the existing (and very good) Open Space Subdivision Ordinance is utilized, and enhancing the connectivity of roads.

The strongest recommendations from the Wildlife Habitat and Natural Resources review are to require Preliminary Conceptual Consultation for subdivisions and Pre-Submission Discussion for site plans in the Rural and Conservation districts and to permit Open Space Subdivisions by right in the Rural and Conservation districts, with conventional, frontage-based subdivisions permitted by special exception. Pre-application meetings provide the opportunity to identify important resources on a parcel and determine appropriate strategies for their protection *before* survey and engineering investments commit a developer to a specific site plan or subdivision layout. Permitting Open Space subdivisions by right provides an incentive for this approach, which facilitates natural resource protection and implementation of smart growth principles. We also recommend either a comprehensive natural resources overlay district or a series of specific overlay districts to protect the Town's natural resources for future generations.

Document Description

This report is divided into several sections: the first two sections address Smart Growth in Gilmanton, the next two sections address Wildlife Habitat and Natural Resources; Section 6 synthesizes recommendations from the two assessments, and the final section provides voluntary practices to protect wildlife habitat features and a supplementary list of resources.

How to use this document

The intended use of this document is two-fold. Firstly, it should serve as reference for community leaders as they review and revise municipal planning documents with such questions as, "Are we working towards Smart Growth and doing the best we can to protect our natural resources?" and "Are our land use planning documents consistent with one another?" This should also be a "living document" - as policies are adopted and documents revised, these changes should be noted in this binder.

This document is intended to be a resource, and contains references to additional resources and model ordinances. In particular, we refer frequently to *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development.* This reference, published in 2008 by the NH Department of Environmental Services, NH Association of Regional Planning Commissions, NH Office of Energy and Planning, and NH Municipal Association, is a critical reference for New Hampshire planning boards. We also strongly recommend use of *Integrated Landscaping: Following Nature's Lead* to advise developers on landscaping strategies.

In the end, however, there is no substitute for direct assistance and advice. Gilmanton is fortunate to have a knowledgeable, experienced Town Planner whose role includes supporting the Planning Board in the implementation of changes and helping to ensure

consistency among the town's planning documents. The town can also draw upon the Lakes Region Planning Commission for assistance in drafting changes to ordinances and regulations.

Habitat/Natural Resource Topic	Smart Growth Principle
Agriculture and Productive Soils	4. Working landscape
Energy Efficiency	1. Compact settlement patterns 5. Transportation choices and safety
Floodplains	6. Environmental quality
Forests and Forestry	4. Working landscape 6. Environmental quality
Green Infrastructure	4. Working landscape 6. Environmental quality
Groundwater	6. Environmental quality 8. Work with neighboring towns
Growth Management and Sprawl	1. Compact settlement patterns 2. Human scale of development 5. Transportation choices and safety
Impervious Surfaces	6. Environmental quality
Landscaping and Natural Vegetation	6. Environmental quality
Light Pollution	6. Environmental quality
Natural Hazards	6. Environmental quality 8. Work with neighboring towns
Shorelands, Surface Waters, and Wetlands	6. Environmental quality
Steep Slopes and Ridgelines	6. Environmental quality 8. Work with neighboring towns
Stormwater Management and Erosion Control	6. Environmental quality
Terrain Alteration	6. Environmental quality
Village District	1. Compact settlement patterns 2. Human scale of development 3. Mix of uses
Watersheds	6. Environmental quality 8. Work with neighboring towns
Wildlife Habitat	6. Environmental quality

Smart Growth Principle	**Habitat/Natural Resource Topic**
1. Compact settlement patterns	Energy Efficiency Growth Management and Sprawl Village District
2. Human scale of development	Growth Management and Sprawl Village District
3. Mix of uses	Village District
4. Working landscape	Agriculture and Productive Soils Forests and Forestry Green Infrastructure
5. Transportation choices and safety	Energy Efficiency Growth Management and Sprawl
6. Environmental quality	Stormwater Management and Erosion Control Floodplains Forests and Forestry Green Infrastructure Groundwater Impervious Surfaces Landscaping and Natural Vegetation Light Pollution Natural Hazards Shorelands, Surface Waters, and Wetlands Steep Slopes and Ridgelines Terrain Alteration Watersheds Wildlife Habitat
7. Community involvement	All
8. Work with neighboring towns	Groundwater Natural Hazards Steep Slopes and Ridgelines Watersheds

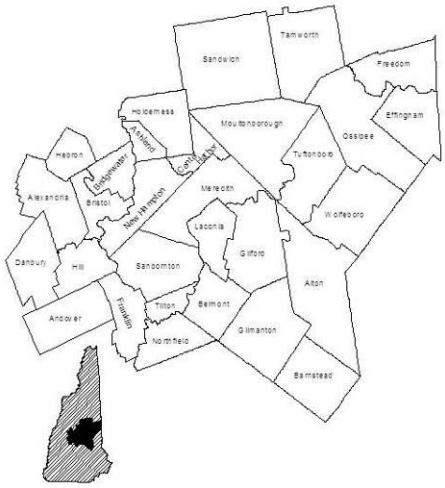
Smart Growth Assessment: Gilmanton, NH

Building Community in Gilmanton

January 2011

Prepared by the Lakes Region Planning Commission in consultation with the Gilmanton Planning Board. Support for the project was provided by the Samuel P. Pardoe Foundation.

THE LAKES REGION PLANNING COMMISSION



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I. What is Sprawl?

Since the 1980s, New Hampshire has had the fastest growing population rate of all the New England states[1]. While this rate has decreased during the past decade to 6.5%, it still represents an additional 8,000 residents per year[2]. Economically, this growth is often perceived as good for New Hampshire; it brings new jobs, new people, and new ideas. At the same time, however, it also brings new challenges.

Unmanaged, growth can become sprawl, which threatens to destroy the very qualities that make New Hampshire a great place to live.

"Sprawl is a pattern of development that results when:

- we use more and more land for various human activities;
- the places where we conduct activities are farther apart, and tend to be in homogeneous rather than mixed-use groupings; and
- we rely on automobiles to connect us to those places.

Development or change in land use contributes to sprawl when:

- it increases the need or demand for motor vehicle trip miles per housing unit in the community;
- it increases the per-person or per-unit amount of land space devoted to cars; and
- it otherwise increases the per-person or per-unit consumption or fractionalization of land areas that would otherwise be open space."[3]

http://www.mercola.com/ImageServer/Public/2005/september/9.16sprawl.jpg

> "Sprawling growth moves away from our town centers, leaving downtowns struggling. It spreads residential development across the rural landscape on large lots, eliminating the farms and woodlots of the working landscape - the pieces that are the very essence of rural character. The resulting pattern of development leaves islands of single uses widely spread apart from each other. In many areas the automobile becomes the only logical way of reaching these far-flung districts. Instead of the traditional mixed use patterns of development, where at least some residential development was directly accessible to downtowns that provided a variety of commercial, industrial, and institutional activities, we have residential subdivisions and office parks far outside of downtown. Instead of small-scale retail centers, we have stores and retail complexes hundreds of thousands of square feet in size, surrounded by acres of parking. In doing so, we are losing any traditional, distinctive New Hampshire character."[4]

The NH Department of Environmental Services has studied the pattern of land use in New Hampshire and has this to say about its impact on the state's environment, "'Sprawl' describes a pattern of development

[1] NH Office of Energy and Planning webpage, http://nh.gov/oep/programs/DataCenter/Population/PopulationEstimates.htm (visited 11/12/10).
[2] US Census, http://2010.census.gov/2010census/data/index.php (visited 1/25/11).
[3] NH Office of State Planning, *Annual Report to the General Court and the Governor on Growth Management*, December 2001 p.2.
[4] NH Office of State Planning, *Report to Governor Shaheen on Sprawl*, December 1999. p. 1.

characterized by increasing amounts of developed land per person, scattered, low-density development, and the fragmentation and loss of open space. Sprawl and other poor development practices impose significant negative impacts on air and water quality, reduces the quantity and quality of wildlife habitat, and limit recreational opportunities for area residents."[5]

Sprawl is expensive because it increases the cost of municipal services and thus taxes; it destroys the traditional land uses of forestry and agriculture; it makes us more dependent on the automobile, thus increasing traffic, congestion and air pollution; it increases water pollution through increased pavement; and it destroys the small town, rural character that is so important to many of New Hampshire's communities.

This type of development occurs not because of the ill will of developers or the ineffectiveness of government. Developers respond to market forces within the rules established by state and municipal governments. At times, however, the rules are not coherent, consistent, or logically linked to the goals they are intended to realize. Sometimes rules designed for one desirable purpose have unintended, undesirable consequences. For example:

- Two acre zoning intended to preserve a rural setting results in the fragmentation of wildlife habitat;
- Land use regulations regulating odors intended to protect health in a residential area results in limits on farming that hastens the loss of large tracts of working open space.

The term 'smart growth' is sometimes substituted for policies and techniques that prevent or counteract sprawl. The central focus of a Smart Growth Assessment is to provide a useful link between the Principles of Smart Growth and their application in municipal land use practice. This report is a step in providing that link for the city of Gilmanton, NH. It is intended to be a guide as the town updates its regulations, ordinances, and master plan.

[5] Smart Growth webpage, NH Department of Environmental Services, http://www.des.state.nh.us/wmb/was/smartgrowth.htm (visited November 12, 2010).

II. Patterns in Gilmanton

A. Population and Demographics

Gilmanton is a rural town with a large land area. Its relatively small population (just over 3,400 residents) has nearly doubled in the last three decades. Like most Lakes Region communities, Gilmanton serves a sizable seasonal population, most noticeably in the summer. From the Master Plan, "Gilmanton is a bedroom community; many will accept a longer commute in order to live in an area with a lower density of development, as well as to further stretch their housing dollar."[6]

In the 1980s the population of New Hampshire increased by 20% with an additional 11% increase in the 1990s. The Lakes Region population grew at 17.6% in the 1980s and 15.8% in the 1990s. During the 1980s Gilmanton's rate of growth (34%) was far higher than both the state and region and was still higher than both areas in the 1990s (17%).[7] According to the NH Office of Energy and Planning (NH OEP), Gilmanton's 2009 estimated population was 3,438 yielding an estimated growth rate of 12% since the 2000 Census. The communities adjacent to Gilmanton as a group have shown similar rates of growth since 1980.

NH OEP projects that the state population will grow at a rate of 14.6% from 2010 through 2030. Gilmanton's population is projected to increase by approximately 19.8% during the next two decades, faster than the projected rate for Belknap County of 14.9%. This level of growth would result in 740 additional residents in Gilmanton by 2030.[8] Gilmanton has an estimated 60.9 persons per square mile (p/sq. mi.) in 2008. The estimated density for Belknap County for the same time period was 152 p/mi^2.

NH OEP demographic projections are only available at the state and county levels, therefore comparisons between communities cannot be made.[9] Statewide, the percent of the population over 64 years of age is projected to triple between 2000 and 2030, while the number of people under 25 is predicted to experience slow growth. In Belknap County the number of residents over 64 years of age is projected to more than double, while the number of people under 25 years old is expected to drop slightly. The percentage of Belknap County residents over age 64 is projected to increase from 16% to 38% while the proportion of residents under age 25 is expected to drop from over 26% to about 19% of the county's population by the year 2030.

B. Housing

In the 1980s the number of housing units in Gilmanton increased by 21% from 1,440 to 1,744. By 2000 Gilmanton had 1,848 housing units, an increase of 6% from 1990. The housing boom of the 1980s was even greater around the region and the state with growth rates of 29% and 30%; in the 1990s the number of housing units in the Lakes Region and the state were growing at 6% and 8.6%, respectively.

Gilmanton's seasonal housing stock increased during the 1980s from 685 to 752 then dropped to 648 units in the 1990s. In 1980 nearly fifty percent of the units in Gilmanton were seasonal, by 2000 the seasonal

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[6] Gilmanton Master Plan, 2005 VIII. Infrastructure Findings, C. Economics & Transportation:
[7] *Lakes Region Demographic Profile,* Lakes Region Planning Commission, 2003.
[8] http://www.nh.gov/oep/programs/DataCenter/Population/documents/MunicipalPopulationProjections2010-2030.pdf, visited Nov. 13, 2009.
[9] http://www.nh.gov/oep/programs/DataCenter/Population/documents/populationforcountiesbyageandsex.pdf, visited December 10, 2009.

housing figure was 35%; above the Lakes Region average of 30% and more than three times higher than the state average of 10%.

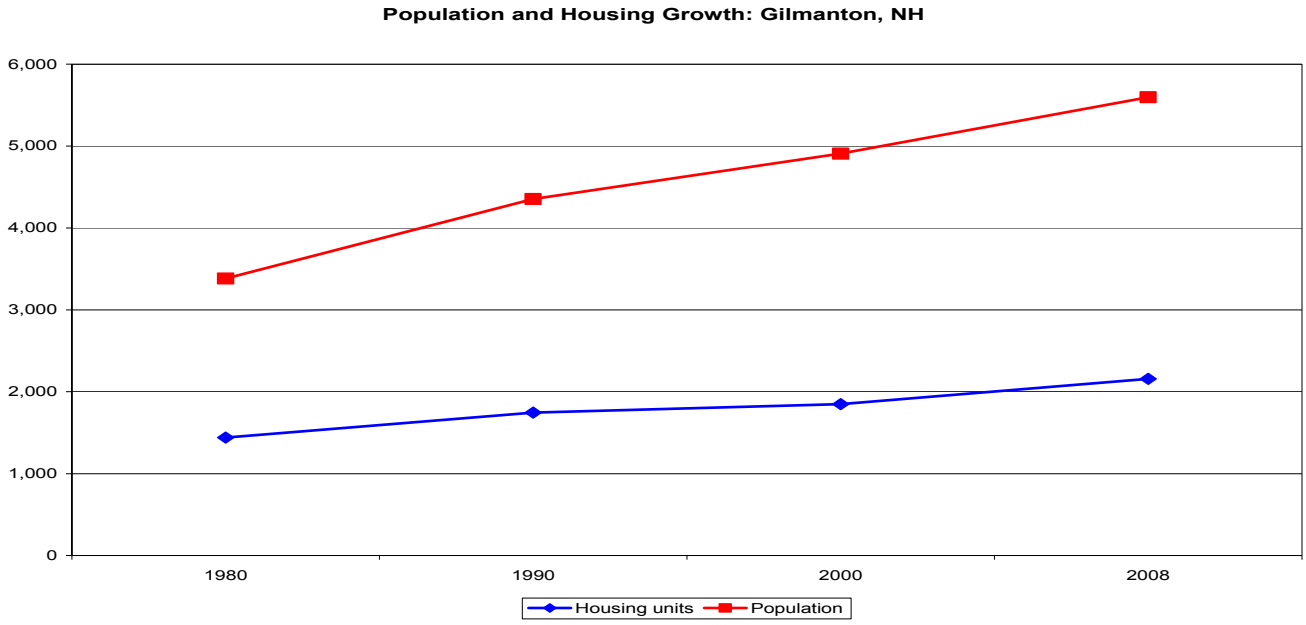
In Gilmanton, one finds about the same percentage of manufactured housing as the rest of the Lakes Region (2.3% vs. 2.7%) and about a third as much multi-family housing (3.6% vs. 10.5%). Single family housing represents 94% of Gilmanton's housing stock, significantly more than the Lakes Region average of 78%[10].

Between 2000 and 2008, Gilmanton granted an average of 34 residential permits a year, with a peak of 55 permits in both 2002 and 2003 and a low of -1 in 2008, resulting in a total of 2,158 units. This represents a growth of nearly 17% in nine years, well over twice the rate of the previous ten years and close to the rate of the 1980s.[11] Beginning in 2005, Gilmanton saw a slowdown in development, reflecting a state-wide pattern. In Gilmanton's case, this slowdown also coincides with the adoption of their Growth Management Ordinance.

C. Summary

While the population of Gilmanton grew by more than 34% in the 1980s, the amount of housing stock grew by just over 20%. During the 1990s the rate of population growth slowed (17%) but still outpaced the growth of housing stock (6%). Building permits issued through 2008 indicate that the growth rate of residential units was nearly 17%.

Rate of Growth	1980-1990	1990-2000	2000-2008
Population	34.4%	17.3%	12.4%
All Housing Units	21.1%	6.0%	16.8%



[10] *Lakes Region Demographic Profile,* Lakes Region Planning Commission, 2003.

[11] *Development Activities in the Lakes Region: 2009 Annual Report*, Lakes Region Planning Commission.

III. What is Smart Growth?[12]

Change is occurring in New Hampshire - more people, more traffic, changing jobs, higher taxes, and various stresses on the environment. Given these pressures, it is understandable that taxpayers and communities often respond with a loud "STOP!" Growth management, tax caps, and budget cuts are all natural responses to situations that appear overwhelming.

Smart Growth says, "First, decide on your vision. Then explore the possible ways to achieve it." In practical terms, Smart Growth consists of evaluating and shaping all new development and re-development initiatives according to the following eight principles:

1. Maintain traditional **compact settlement** patterns to efficiently use land, resources and infrastructure investments;
2. Foster the traditional character of New Hampshire downtowns, villages, and neighborhoods by encouraging a **human scale** of development that is comfortable for pedestrians and conducive to community life;
3. Incorporate a **mix of uses** to provide a variety of housing, employment, shopping, services and social opportunities for all members of the community;
4. Preserve New Hampshire's **working landscape** by sustaining farm and forest land and other rural resource lands to maintain contiguous tracts of open land and to minimize land use conflicts;
5. Provide **choices and safety in transportation** to create livable, walkable communities that increase accessibility for people of all ages, whether on foot, bicycle, or in motor vehicles;
6. Protect **environmental quality** by minimizing impacts from human activities and planning for and maintaining natural areas that contribute to the health and quality of life of communities and people in New Hampshire;
7. **Involve the community** in planning and implementation to ensure that development [supports] and enhances the sense of place, traditions, goals, and values of the local community; and
8. Manage growth locally in the New Hampshire tradition, but **work with neighboring towns** to achieve common goals and address common problems more effectively.

[12] Text in Sections I and II is adapted from *GrowSmart NH Tool-Kit Project*, 2002, NH Office of Energy and Planning and Planning Decisions, Inc. http://nh.gov/oep/programs/SmartGrowth/_docs/chester_report.pdf pp.3, 4.

IV. What is a Smart Growth Assessment?

A Smart Growth Assessment evaluates where the community stands regarding the Smart Growth Principles. To accomplish this, several steps must be taken:

- Trends in the municipality's population and development are compiled along with projections for these patterns.
- The community reviews the eight NH Smart Growth Principles and identifies which of these they support.
- The most recent Master Plan goals and objectives are reviewed for statements that support the Smart Growth Principles,
- The current local land use ordinances and regulations are reviewed for consistency with each of the town-supported Smart Growth Principles.
- Patterns and practices in town are assessed as they pertain to Smart Growth.
- Suggestions are made regarding what steps the community might take to better implement the identified Smart Growth Principles.

This assessment is based upon the most current documents available for Gilmanton, including the *Master Plan, 2005, Zoning Ordinances, 2010*; *Subdivision Regulations, 1999*, *Site Plan Review Regulations, 2000, and Historic District Regulations, 2009*. Also consulted for this plan were the *Natural Resources Inventory, 2004,* and *Hazard Mitigation Plan, 2005*.

V. Smart Growth in Gilmanton

A. Gilmanton's Smart Growth Principles

The Gilmanton Planning Board reviewed the eight Principles of Smart Growth outlined by the NH OEP that apply to New Hampshire communities and agreed that all of the Principles apply to Gilmanton.

B. Smart Growth Checklist and Gilmanton's Planning Documents

The intent of this Smart Growth Assessment is to provide the town of Gilmanton and especially the Gilmanton Planning Board with tools for understanding how the town stands in its efforts to embrace and implement Smart Growth identifying any impediments to implementation that might exist.

One method of assessing a community's progress towards Smart Growth is a Smart Growth Checklist. Over the years several checklists have been developed by a variety of public and private organizations, some analyzing planning documents exclusively, others focusing on patterns and community actions[13]. LRPC staff recognized the desire of the Planning Board to have a review of their documents for consistency as well as the need to take into account patterns and local actions. As a result a compilation of several checklists was developed that has a 60/40 ratio of references to planning documents versus patterns and actions (Section 3).

This checklist asks the reviewer to choose which of three phrases best characterize the documents/patterns/actions. A number '1', '2', or '3' is associated with each phrase, with '3' corresponding

[13] http://www.epa.gov/dced/scorecards/, visited August 13, 2009

to the phrase that best reflects "Smart Growth". The points under each principle can then be totaled to give an indication of where the community currently stands in terms of implementing each of the Smart Growth Principles.

Included in Section 3 is a document "Checklist Answers & Documentation", which addresses each of the questions with statements from the Master Plan, Zoning Ordinance, Regulations (Site Plan and Subdivision), identified patterns, or observations from the Planning Board. Those statements which contradict the Principle are in red text. The Smart Growth Assessment Checklist (Sections 2 and 3) should be updated annually to reassess the town's progress.

The section which immediately follows this text builds upon the information in Section 3, analyzing how closely the guiding documents of the municipality are aligned with each Principle. Where appropriate, the analysis addresses some of the impediments to implementing Smart Growth and makes suggestions for improvement. Such recommendations are referenced to the Master Plan (MP), Zoning Ordinance (ZO), Subdivision Regulations (Sub), Site Plan Review Regulations (SPR), or Actions and Policies (A&P).

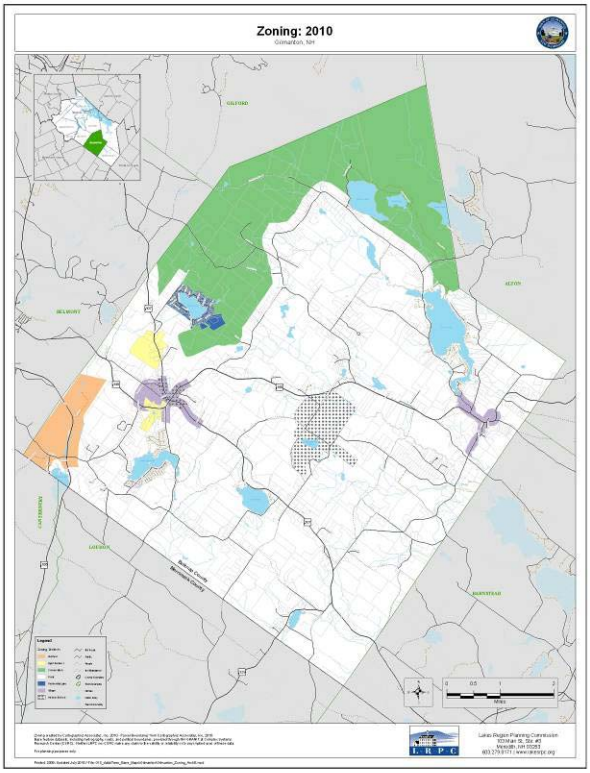
Efforts were made to link each reference's individual goal, objective, ordinance, or regulation with one Principle; however, some repetition was necessary. Due to the interrelated nature of the Smart Growth statements, there are some statements that play an important role in shaping the town's ability to implement multiple Principles. Many foster the Smart Growth Principles; in a number of cases the Gilmanton Master Plan has statements supportive of a Principle and there are no statements contrary to the Principle, but in other documents they are merely silent on the topic.

Smart Growth Principle 1:

Maintain traditional compact settlement patterns

Maintain traditional compact settlement patterns to efficiently use land, resources and infrastructure investments.

Description:



The town of Gilmanton has two villages, Gilmanton Corners and Gilmanton Iron Works. Several municipal buildings are located in the Corners. A few businesses are located in each of the villages but other businesses are scattered throughout town. Likewise residences are scattered throughout the town. The Business, Light Business, Lake Residential, and Village Districts reflect existing development patterns. Most are along state highways.

The Business District encourages development of industrial and commercial enterprises along NH Route 106 with good access to I-93. The Light Business and Village Districts are also located primarily along state routes (NH Routes 140 and 107). They are somewhat compact in nature but do reflect the linear nature of the roads that define them.

Gilmanton has a mix of residential development patterns; there are clusters in the two villages as well in the Historic Districts, there are clusters around Sawyer and Crystal Lakes and Shellcamp Pond, and there is scattered development along the various state and local roads in town.

Town facilities include Police, Fire, and Highway Departments, the Elementary School, the Transfer Station, and Town Offices. The Town Offices are located in the Corners, the new Public Safety Building is just west of the Corners, the Highway Department and a second Fire Station are located in the Iron Works, the school is on NH Route 140 between the Historic District and the Iron Works, and the Transfer Station is on NH Route 107 north of the Corners. The town does not have sewer or water services; each lot must have the capacity to accommodate both a well and a septic system, unless a community well or septic system are utilized.

Analysis:

The Gilmanton Master Plan begins with the Vision Statement, "As our population grows, sustainable residential growth should be concentrated in areas of the town where such growth will allow public services to be provided in a cost effective, efficient manner." which speaks very directly to each element of Principle 1.

Specific points mentioned in the Master Plan include the costs associated with meeting public education, police, fire, and municipal waste disposal requirements. It is noted that conversion of seasonal residences and development along Class VI roads puts pressure on the infrastructure. There are recommendations for increasing densities in areas of existing development, adoption of an open space conservation subdivision allowing more concentrated density of lots with preservation of, at minimum, half the buildable acreage, and addition of Impact Fees on all new construction.

There is reference to Principle 1 in some of the District Descriptions in the Gilmanton Zoning Ordinance - The purpose of the Residential Lake District is to allow for higher density single-family dwellings, Light Business District: Specific design standards shall apply … to prevent strip development, and The intent of the Conservation District is to avoid the burden of unreasonable municipal expenditures involved in providing municipal services to remote and difficult locations. Several items in the Open Space Subdivision Ordinance are designed to make efficient use of land and infrastructure including a reduced frontage requirement, a density bonus, and reducing the length and width of roads and utility runs. While the master plan puts forth a vision of increased density in the village districts, lack of infrastructure and accompanying dimensional restrictions limit what can actually happen in these areas.

The Subdivision Regulations encourage the Planning Board to consider the town's ability to provide street maintenance and snow removal, schools, fire protection, and other services. The Site Plan Regulations enable the Board to require environmental and economic impact statements on public services and any other factors that could impact the short and long term well-being of the public.

The Planning Board indicates that residential development in the 1990s occurred in the Iron Works section of town. They anticipate that future development will occur along NH Route 140, Stage Road and Stone Road providing relatively easy access to state routes for commuters to the Concord area.

The District boundaries strongly reflect the existing circumstances, following existing roads and property boundaries.

Recommendations:

The Gilmanton Master Plan makes it clear that the town embraces the concept of varying population densities throughout town depending on the character of the zoning district. These districts were developed with consideration of the landscape, existing development, and how the town would like to guide future growth. It is recommended that the Planning Board consider adjusting some of the district boundaries to reflect the town's vision of growth. This could include broadening the Village District boundaries to impart a more nodal vision (promoting less strip development) and provide the opportunity to have a network of cross streets. (ZO)

The next Master Plan Update should include a Future Land Use section, providing a broad picture of the patterns of land use that the town wishes to see over the next 10 – 20 years (RSA 674.2.II.b). (MP)

To implement the density recommendations called for in the Master Plan, the town needs to overcome the limitations posed by not having sewer or water infrastructure in the areas where higher densities are anticipated. One option that the town should consider is that of the community septic and water systems. The use of community septic systems in the Village Districts might enable the use of smaller lots and more compact development. (A&P, ZO)

The Planning Board could take steps to help the town make better use of its resources by developing a road network plan and putting in requirements for road connectivity. The more development that is permitted along "non-interconnected" roads, the more pressure is placed on municipal services. Additionally, the Planning Board could work with the Police and Fire Departments to incorporate elements of the CPTED (Crime Prevention Through Environmental Design[14]) into the planning process. Many of these elements are consistent with Smart Growth Principles. (A&P, Sub)

Encourage the development of interconnected streets both in the Village Districts and in any subdivisions that require the construction of roads. (Sub)

[14] http://www.thecptedpage.wsu.edu/Intro.html (Accessed January 15, 2010).

Smart Growth Principle 2:

Foster a human scale of development

Foster the traditional character of New Hampshire downtowns, villages, and neighborhoods by encouraging a human scale of development that is comfortable for pedestrians and conducive to community life.

Description:

Gilmanton has two villages and a two Historic Districts. The Corners village incorporates a small Historic District. The Village Distracts are primarily along state roads. These are rural village districts; buildings are separated by lawns, and there are few, if any sidewalks in town.

Analysis:

The Master Plan says this about human scale of development in Gilmanton, "Although the community is open to new technologies and opportunities, the preservation of Gilmanton's rural character is always the context in which its residents evaluate them."

In the Zoning Ordinance, the Village District is described in this manner, "The objectives of the Village Districts are to continue the mixed-use village character, to preserve existing structures, to minimize vehicular congestion and provide maximum pedestrian access, and to preserve the significant historic value." Open Space Subdivisions are encouraged to have trails, scenic beauty, and greens or playgrounds. An objective is to create compact neighborhoods accessible to open space amenities. In considering subdivision applications, Planning Board members are encouraged to consider harmonious development of the town and features designed to integrate the subdivision with the neighborhood. In Site Plan Review, the Board may consider the height and bulk of the building along with sidewalks, fences, screening, lighting, and signage. Off street parking and access along with landscape buffering are to be addressed during Site Plan Review, although with very broad wording, "Sufficient off-street parking…for the anticipated use…so that no parking is forced onto public streets" and "Sufficient landscape buffers …shall be provided to reduce noise and provide privacy between proposed development and abutting properties." More specific language is used to give minimum values for landscaping of large parking areas and lighting, "Adequate interior landscaping, islands and strips covering a minimum of 5% of the parking lot area shall be provided in parking areas of more than twenty (20) spaces" and "Outdoor lighting shall not glare on abutting properties or on public highways or streets".

Lots in the Village Districts are required to have a minimum of one acre of land; this is also the minimum lot size in the Residential Lake and both Business Districts. The Rural District requires two acres of land. Required frontage ranges from 125' in the Village and Residential Lake Districts to 200' in the Rural and Business Districts. These are fairly large dimensional requirements for areas where the community hopes to concentrate development.

In Gilmanton, as with other rural/edge communities, the scale of construction is not a problem; development occurs at "human scale". The real challenge is that a vehicle is required to go anywhere in town.

Recommendations:

While the broad, open-ended statement that "sufficient parking" be provided ensures that each situation be treated individually and allows for negotiation, it may be useful to the applicant to have some minimum standards. This may also lead to a quicker approval process. (SPR)

Consider requiring the construction of sidewalks in subdivisions of a certain size. (Sub)

Consider adopting a Dark Skies Lighting regulation as part of the Site Plan Review Regulations see *Innovative Land Use Planning Techniques (2008).* (SPR)

Consider constructing sidewalks in the Village Districts. (A&P)

Smart Growth Principle 3:

Incorporate a mix of uses

Incorporate a mix of uses to provide a variety of housing, employment, shopping, services and social opportunities for all members of the community.

Description:

Gilmanton holds firmly to its rural/agricultural roots. The town has a smattering of commercial activity throughout most of its zoning districts. The Business District is along NH Route 106 in the western corner of town. There are two Light Business Districts to the north and south of the Corners Village District. There is not, however, a shopping area where one might go to do regular shopping; residents need to drive to another community to meet many of their daily needs. Almost all of the housing in Gilmanton is Single Family Residential. Gilmanton is an active community with a number of social activities occurring in town.

Analysis:

Mixed commercial and residential development is part of the Vision statement in Gilmanton's Master Plan, specifically identifying affordable and elderly housing as part of the mix. Further, it is stated that these housing types should be sited in and around the Village Districts and that medical, social, and transportation services should be available for these residents. The need for more commercial has already led to the development of the new Light Commercial Districts near the Corners Village District.

The Village Districts have a mixed-use character consisting of concentrated community living, a few small-scale retail and service businesses, and civic uses; however, such uses are only by Special Exception. Home occupations are permitted in all districts, providing the opportunity for residents to work in town. Two-Family Housing, which could incorporate an accessory apartment, is permitted in most districts; Multi-Family Housing is permitted by Special Exception in two of the districts.

Choices for housing in Gilmanton are limited. According to the 2000 Census only 15% of the employed residents of Gilmanton work in town, the remaining 85% have to commute to jobs out of town. Gilmanton has one of highest commuting rates of the thirty Lakes Region communities.

Recommendations:

The town should take steps to enhance affordable housing opportunities for younger people in Gilmanton entering the workforce. Permit and promote new multi-family housing to help diversify the town's housing stock and make it more affordable for folks to live in Gilmanton. (ZO, A&P)

During the planning of the new Year-Round Library, there was an effort to develop some housing for the elderly on adjacent land. While this effort did not succeed, it is the sort of concept that can increase the diversity of housing options in Gilmanton and encourage the development of nodal development, with residential in close proximity to some services. (A&P)

The town should consider permitting several commercial uses within the Village Districts, instead of requiring that Special Exceptions be required for activities such as small retail and service businesses. (ZO)

Smart Growth Principle 4:

Preserve New Hampshire's working landscape

Preserve New Hampshire's working landscape by sustaining farm and forest land and other rural resource lands to maintain contiguous tracts of open land and to minimize land use conflicts.

Description:

While Gilmanton is a bedroom community with a majority of its residents commuting to work out of town, it does have a number of working farms and has a substantial amount of sustainably managed woodlots, including town forests. The Conservation Commission and Belknap Range Association are active. A Natural Resources Inventory was completed in 2004.

Analysis:

Open space, forestry and agricultural uses are incorporated into the town's Vision Statement. The Master Plan of many NH communities incorporate statements professing that their community "values the rural landscape"; Gilmanton's does too but it goes several steps beyond with statements like these, "Suggestions have been made to encourage farming by providing incentives to make farming more profitable and less costly. Suggestions also include zoning changes based on working farms overlay districts, or the allowance of special cluster type dwelling for farm employees and family." The Town has reserved several parcels as Town Forests. The Conservation Commission has initiated a program to survey the Town forests and develop forest management plans which will allow for periodic sustainable timber harvesting together with recreational uses and habitat maintenance.

Gilmanton's Zoning Ordinance firmly supports customary agricultural uses, exempting farms from restrictions on building height and 'Obnoxious Use' provisions. Agriculture and Forestry practices are permitted in all districts; sawmills are permissible in three of the districts. Gilmanton allows "woodlot subdivisions", with a deed restriction limiting development activity on the lot to forestry and woodlot management.

Gilmanton does have a Farmers Market, providing an opportunity for locally raised products to be sold. Concern was expressed by the Planning Board regarding the fate of the existing farms in town when it comes time for the owner's to sell the land.

Recommendations:

The town should continue to promote the local Farmer's Market as a venue for local farmers to sell their produce and as a means of keeping local farms in the public eye. (A&P)

The town should explore working with the current farmers and the USDA and NRCS to purchase development rights for these parcels to ensure that they remain working farmsteads. (A&P)

Smart Growth Principle 5:

Provide choices and safety in transportation

Provide safety and choices in transportation to create livable, walkable communities that increase accessibility for people of all ages, whether on foot, bicycle, or in motor vehicles.

Description:

State routes dominate Gilmanton's landscape, with the intersection of NH Routes 104 and 107 defining the Corners Village District and NH Route 106 being the location of the Business District. Most town facilities are located along these roadways (Town Hall, Public Safety Building, Iron Works Fire Station, Elementary School, libraries, and transfer station). A small network of a few local streets can be found near Shellcamp Pond, most other roads either dead end or have long distances between intersections. All are 'country roads'; due to the relatively low volume of traffic they are walkable but realistically, one must have a vehicle to get around in Gilmanton.

Analysis:

Gilmanton's Master Plan has statements related to maintaining the infrastructure and acknowledging the major impacts on traffic flow in town. It does call for flexible roadway standards, which could lead to roads that are better matched to the neighborhoods that they serve. There is also a recommendation that a regional transportation system be developed for those without vehicles.

The location of the business districts were established partly based on their accessibility to major roadways. Open Space Subdivision stresses a town-wide trails network.

In the last five years the town has taken steps to clarify the designation of Class 5, Class 6, and private roads. Class 6 roads are actively utilized for hiking, horseback riding, and snowmobiling. While all new roads must meet town standards, the planning board does have some flexibility in road design for Open Space Subdivisions.

Recommendations:

Work with the NH DOT, using the Context Sensitive Solutions method, to develop and implement traffic calming in the Village Districts. (A&P)

Strive for connectivity among all future streets. (MP, Sub)

Maintain and utilize the flexibility in street design available with Open Space Subdivision. (ZO)

Consider developing flexible road design standards for all local roads. (Sub)

Require or encourage the construction of sidewalks in the Subdivision Regulations. (Sub)

The town should explore greater representation on the Region 3 Regional Coordinating Council (for public transportation) and the Lakes Region Transportation Technical Advisory Committee (for issues related to regional transportation). (A&P)

Smart Growth Principle 6:

Protect Environmental Quality

Protect environmental quality by minimizing impacts from human activities and planning for and maintaining natural areas that contribute to the health and quality of life of communities and people in New Hampshire.

Description:

Gilmanton has a large area characterized by a mixture of forests, small lakes, and fields. Development has occurred around most of the lakes. The northeastern section of town comprises the Conservation District. There are several town forests. The Conservation Commission has been active, working with the Planning Board and regional land protection organizations to develop protective ordinances and work with local landowners to preserve sections of town that have important natural characteristics.

Analysis:

In discussing Growth in town, the Master Plan states, "It is important that Gilmanton retain its rural appeal as this is the reason many people have chosen to live here." Gilmanton's Vision Statement stresses, "…the wise stewardship of the town's important water resources, shorelands, wildlife habitat, and ecological resources". "The community favors the establishment of conservation easements, encourages the donation of such easements." It recommends that the town, "…protect the lands of ecological sensitivity in the planning process and also by acquisition." It recognizes the need to fund long term monitoring of conservation easements and oversight of town-owned properties. The Master Plan promotes the concept of greenways, connecting large, undeveloped sections of land.

Based on Master Plan recommendations, the town has an Open Space Subdivision Ordinance, which requires 50% Open Space; these are permitted in all zoning districts. While stressing flexibility and creativity, the objectives of this ordinance are specifically enumerated, including soil characteristics, impervious surfaces, habitat conservation. There is a 20-acre minimum for Open Space Subdivision but this may be waived. Open Space Subdivision may be required based on soils characteristics, wildlife, or surface/groundwater. Density bonuses are available. This is a very thorough Open Space Subdivision Ordinance. Numerous natural resources elements are referenced in the Site Plan Regulations but they often rely on the wording, "Adequate measures shall be provided…"; greater specifics may be helpful here.

The Master Plan also describes some of the actions that the town now takes, "Within the last 10 years the Town has reserved several additional parcels as Town Forests. The Conservation Commission has initiated a program to survey the Town forests and develop forest management plans which will allow for periodic sustainable timber harvesting together with recreational uses and habitat maintenance." Also "The Town now sets aside a portion of the land use change tax for the acquiring and monitoring of open space lands." A detailed Natural Resources Inventory was developed in 2004 and was adopted as part of the Master Plan.

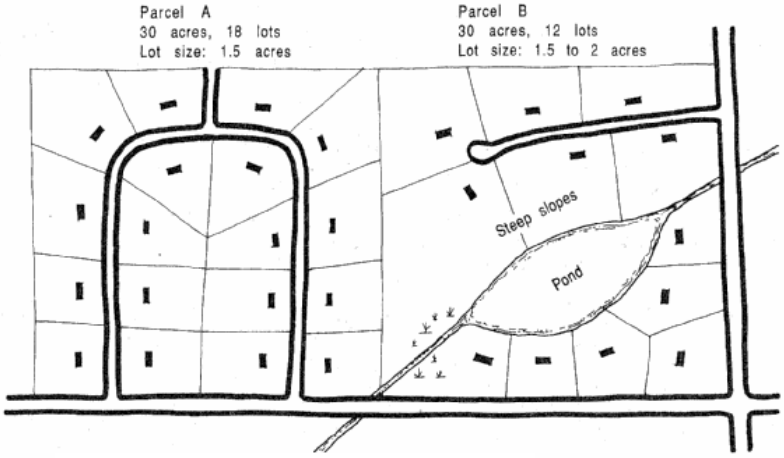
There appears to be good collaboration and coordination between the Planning Board and the Conservation Commission.

Recommendations:

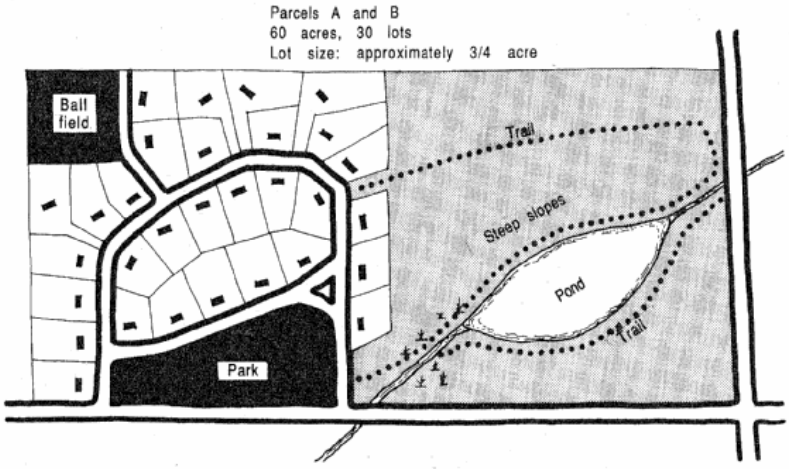
The Planning Board should consider making Open Space Subdivision mandatory in the Conservation and Rural Districts; if an applicant wishes to utilize 'conventional subdivision', then a Special Exception would be needed. (ZO)

Consider incorporating incentives into the subdivision process of all applications for those that preserve linkages between habitats. (Sub)

The town should continue its collaboration with the regional land organizations to protect parcels that include important habitats. (A&P)



Example of Conventional Subdivision



Same area as above as a Conservation Subdivision

Smart Growth Principle 7:

Involve the community

Involve the community in planning and implementation to ensure that development retains and enhances the sense of place, traditions, goals, and values of the local community.

Description:

The Gilmanton Planning Board meetings are open to the public; their schedule, agenda, and minutes are available at the town's website. The update of the Master Plan was published in 2005 and involved dozens of volunteers, a community survey, and several forums. A number of events throughout the year bring the community together to celebrate a variety of events and cultures.

Analysis:

"In the process of preparing to update the 1993 Gilmanton Master Plan, the Planning Board initiated a series of public sessions seeking input from the citizens of Gilmanton about the future direction of the community." Historic resources are valued. The Master Plan recommended that "the Town adopt design standards for our business district to maintain the rural and historic character of the community." "Certainly the Town's Historic District plays an important part in its identity as a New England village. But it is broader than that - it is a community where neighbors work together toward a common good." "Residents celebrate their social capital." Also recommended in the Master Plan, was that the town consider developing a, "Heritage Commission (which) would allow that body to survey historic structures in their unique settings throughout the Town and encourage preservation and community education about its past."

The Zoning Ordinance encourages the preservation of historic structures in the Open Space Ordinance. "New buildings, renovations and signs should be consistent with the present character of the villages and should meet the guidelines of the Historic District Regulations, where applicable."

The town has made a push in recent years to ensure that maps and information are up to date and available for viewing in the Academy Building (Town Hall).

Recommendations:

More might be done to publicize Planning Board activities and make planning documents available. (A&P)

The town should consider applying to Plan NH to work with the community and conduct a charrette related to finding ways to implement increased density in the Village Districts or addressing the anticipated development in the southwestern portion of town. (A&P)

Smart Growth Principle 8:

Manage growth locally

Manage growth locally in the New Hampshire tradition, but work with neighboring towns to achieve common goals and address common problems more effectively.

Description:

Many of Gilmanton's departments work with neighboring municipalities in an effort to offer services at the best available rate. Examples include police and fire mutual aid. The community supports and is involved with a number of regional planning efforts: the Lakes Region Planning Commission, the Belknap County Economic Development Council, and several regional land conservation organizations.

Analysis:

The Gilmanton Master Plan states that it is "Extremely important for the Town to keep current with what all its neighboring towns are doing with management of their growth." Regarding the major traffic impacts on the town, the master plan suggests that the town should work with "neighboring towns and the State to see if some of the impacts can be further mitigated.

Recommendations:

It is vital to maintain communication and involvement with neighboring communities on environmental issues and development proposals. It also benefits the town to work with neighboring communities on other issues that could have mutual benefits. (A&P)

The Planning Board and Conservation Commission should work to coordinate their land preservation and planning efforts with adjacent communities to ensure that such efforts are done effectively. (A&P)

Gilmanton should continue to collaborate with surrounding towns on projects such as road construction and infrastructure needs. Furthermore, should there be a development of regional impact proposed in the future the Planning Board should notify surrounding communities as per RSA 36: 54-57. This notification will allow neighboring communities and the regional planning commission to engage in discussion of the proposal as abutters and will give them a voice in the development process. (A&P)

There are opportunities for greater involvement on regional transportation planning efforts through the Transportation Technical Advisory Committee and the Region 3 Regional Coordinating Council for public transportation. (A&P)

Lakes Region Planning Commission
103 Main Street, Suite #3
Meredith, NH 03253
(603) 279-8171

Smart Growth Assessment:

Checklist Questions

Lakes Region Planning Commission

Note: An asterisks (*) indicates that the answers available were not quite appropriate for Gilmanton's situation. Please refer to the "Checklist Answers and Documentation" sheet.

Smart Growth Principle 1:

Maintain traditional compact settlement patterns

Maintain traditional compact settlement patterns to efficiently use land, resources and infrastructure investments.

A. How visible is the edge of your downtown/village center (or centers, if your municipality has more than one)?

It is clearly visible. _√_ 3 pts
The edge of the downtown/village center is still recognizable, but it has begun to blend with outlying development. ___ 2 pts
There is no distinction between the downtown/village center and outlying development. ___ 1 pt

B. Where is most commercial and industrial growth occurring?

Within the downtown/village center. ___ 3 pts
Both in and outside the downtown/village center ___ 2 pts
Outside the town center, in strip patterns along roads and/or on large lots. _√_ 1 pt

C. Where is most new residential growth occurring?

Mostly within the downtown/village center. ___ 3 pts
Partly within the downtown/village center and partly in outlying areas, often in clustered developments. ___ 2 pts
Mostly in areas outside the downtown/village center, on large lots. _√_ 1 pt

D. Does your master plan include specific language that describes a desired pattern of development? If so, what does this language say?

Yes. The master plan describes a desired pattern of development that includes one or more compact centers, with primarily low-density cluster development in surrounding areas. _√_ 3 pts
The master plan is not specific on the desired pattern of development. ___ 2 pts
The master plan calls for growth throughout town; or there is no master plan. ___ 1 pt

E. Is there a distinct pattern to densities in local zoning — from higher densities in compact centers to lower densities in outlying areas? ***1.5 pts.**

Yes. ___ 3 pts
Yes, but zoning densities in downtown/village center districts are significantly lower than among older lots in the same locations. Outlying areas also have low densities. ___ 2 pts
No. Lot sizes are the same throughout all districts in the community; or they are mixed in size throughout all areas of town. ___ 1 pt

F. If your community provides public sewer and/or water, how are line extensions managed?

The sewer and water service area is defined and consistent with the downtown/village center. Line extensions outside this area are prohibited. ___3 pts

The sewer and water service area is defined and consistent with the downtown/village center — but some line extensions are approved outside this area. _*****_2 pts

The sewer and water service area is not defined. ___1 pt

G. Where are your community's public buildings (including schools and post offices), and where are they planned?

Most existing and planned public buildings are in community core area. ___3 pts

Most existing public buildings are in the community core area, but some planned buildings are on the edge of town. _√_2 pts

Most existing and planned public buildings are on the edge the community. ___1 pt

H. Does development along state roads occur in a node or strip pattern of development?

***1.5 pts.**

Development along state roads is focused into nodes. ___3 pts

Development is a mix of nodes with a strip pattern in between. ___2 pts

Development along state roads is in a strip pattern. ___1 pt

I. Do land use regulations establish minimum densities to promote efficient use of lands designated for higher densities?

Yes. Minimum densities are required. ___3 pts

No, but we find that many developers take advantage of the opportunity to have increased or varying densities. ___2 pts

No. _√_1 pt

J. Do subdivision regulations allow the planning board to require the connection of subdivision streets to existing streets and the stubbing of streets to allow connections to future subdivision developments? What about the provision of interparcel connections between individual developments, where compatible?

Yes. Interconnections between subdivisions to reduce reliance on arterial roads can be required by the planning board. ___3 pts

No. The planning board cannot require this but does suggest it on occasion. ___2 pts

No. Road connectivity is not considered as part of a subdivision application. _√_1 pt

Smart Growth Principle 1 Score	_17__
Smart Growth	30-26
In Transition	25-17
Needs Your Attention	16-10

Smart Growth Principle 2:

Foster a human scale of development

Foster the traditional character of New Hampshire downtowns, villages, and neighborhoods by encouraging a human scale of development that is comfortable for pedestrians and conducive to community life.

A. What scale of commercial and industrial growth is permitted?

We limit the size of new commercial and industrial buildings, to fit with the community's character and the local market. ___3 pts

We limit the size of new commercial/industrial buildings in the town center, but not outside. _√_ 2 pts

We do not limit the size of buildings anywhere. ___1 pt

B. Do townspeople have easy walking access to public parks and playgrounds?

Yes. Parks and playgrounds are available in all larger neighborhoods, and can easily be reached by walking from other parts of the community. ___3 pts

We have some parks and playgrounds, but they cannot be easily reached by walking from all parts of the community. ___2 pts

No. We have very few parks and playgrounds. _√_ 1 pt

C. How do local regulations provide for open space in new developments?

New developments must conform to the community's open-space plan, creating additional open space and connections to adjacent open spaces (either existing or planned, such as a planned park or recreation trail). ___3 pts

Larger developments must provide open spaces, with access to them. But regulations do not give guidelines for types and locations of these open spaces. ___2 pts

There are no provisions for open space with new developments. _√_ 1 pt

D. Do the future land use plan and zoning ordinance allow for compatible, small-scale neighborhood commercial uses (e.g., corner stores) adjacent to or within residential neighborhoods?

Yes. There is opportunity for a mix of commercial and residential. _√_ 3 pts

Yes, but it is not utilized much. ___2 pts

No. Most commercial and residential uses are separated. ___1 pt

E. Do all (or most) zoning districts require a minimum open space ratio (i.e., percentage of land area for each development that must be open space)?

Yes. ___3 pts

A few zoning districts require a minimum open space ratio. ___2 pts

None of the zoning districts require a minimum open space ratio. _√_ 1 pt

Smart Growth Principle 2 Score	8
Smart Growth	15-13
In Transition	12 - 9
Needs Your Attention	8 - 5

Smart Growth Principle 3:

Incorporate a mix of uses

Incorporate a mix of uses to provide a variety of housing, employment, shopping, services and social opportunities for all members of the community.

A. Where are commercial/industrial and residential uses located in relation to each other?

***2.5 pts**

The downtown/village center allows commercial, industrial, and residential uses. ___3 pts
We have mixed-use districts, but they are scattered around the community. ___2 pts
No mixed uses are permitted. Commercial/industrial and residential uses are segregated. ___1 pt

B. Can townspeople meet most daily shopping needs (groceries, hardware, etc.) in the community?

Yes. We can meet everyday needs at a diversity of local businesses. ___3 pts
We can buy some goods in the community, but must travel outside town for others. ___2 pts
No. We have to travel outside of the community to meet most everyday needs. _√_1 pt

C. How does local zoning encourage business development in the downtown/village center?

***1.5 pts.**

It provides for a variety of businesses in the downtown/village center, including those that meet people's daily needs; and it offers regulatory incentives, such as reduced parking and setbacks. ___3 pts
Zoning encourages a mix of downtown business types - but regulations, such as lot size, setbacks and parking, make such a mix of development unlikely. ___2 pts
It does not encourage a mix of downtown business types - and regulations require lot sizes, setbacks, and parking provisions that can't be met in the downtown/village center. ___1 pt

D. Which option best describes the mix of housing types in your community?

We have a mix of housing types, including affordable housing to buy, multi-family rental housing, and senior housing that reflects the composition of our community. ___ 3 pts
We have a limited mix, including some affordable housing. ___ 2 pts
We have very little diversity in housing, and/or very little affordable housing. _√_ 1 pt

E. How has your community planned for future housing needs, especially in and around your downtown?

Our community plan projects the amounts and types of housing that will be needed over the next 10 years or has established housing goals. We also work with local and regional housing groups to meet these needs within or adjacent to our community. ___ 3 pts
The community plan includes a preliminary evaluation of future housing needs, but does not specify how to meet them. _√_2 pts
We have not discussed future housing needs. ___ 1 pt

F. Do local regulations enable your community to meet diverse housing needs and ensure long-term affordability?

Yes. New developments are required to include housing targeted at more than one segment of the market – for example, apartments along with single-family homes, or affordable homes along with market–rate housing. ___ 3 pts
New developments have the option of including a mix of housing, but are not required to. ___ 2 pts
No. New developments are not required to include a mix of housing – and in some cases, they are prohibited from doing so by regulations. _√_ 1 pt

G. Does your community provide incentives to support affordable housing (density bonuses, fee waivers, higher density zones, fast tracking)?

Yes, we have a range of incentives to encourage more affordable housing production. ___ 3 pts

We offer some incentives, but don't actively promote them as an option. ___ 2 pts

No. We do not offer any incentives. _√_ 1 pt

H. If the community has a downtown/village center, are residential uses allowed in the central business zoning district?

Yes. _√_ 3 pts

No. Mixing of residential and commercial is only permitted outside of the downtown area. ___2 pts

No. All commercial and residential uses are separated. ___1 pt

I. Do the provisions within at least some of the residential zoning districts allow for a wide range of housing types by right (versus requiring a conditional use permit or special exception)?

Yes. There is opportunity for a mix of housing types is by right and utilized. ___3 pts

Yes, it is allowed by right but it is not utilized much. _*****_ 2 pts

No. Most zoning districts specify a limited range of housing types. ___1 pt

J. Does the zoning ordinance allow for "accessory apartments" within single-family residential (SFR) zoning districts?

Yes. Accessory apartments are permitted in SFR districts and utilized. _√_ 3 pts

Yes. Accessory apartments are permitted in SFR districts but few actually exist. ___2 pts

No. ___1 pt

Smart Growth Principle 3 Score	18
Smart Growth	30-26
In Transition	25-17
Needs Your Attention	16-10

Smart Growth Principle 4:

Preserve New Hampshire's working landscape

Preserve New Hampshire's working landscape by sustaining farm and forest land and other rural resource lands to maintain contiguous tracts of open land and to minimize land use conflicts.

A. Where is most development in your community located?

Within or close to the downtown/village center.	___3 pts
In outlying areas, but not on farmland.	_√_2 pts
In outlying areas, including farmland.	___1 pt

B. What strategies does your master plan have for protecting farmland?

A comprehensive, specific set of strategies and policies.	_√_3 pts
Some specific strategies.	___2 pts
Vague or no strategies.	___1 pt

C. Does your master plan map the location of farms and prime agricultural soils?

Yes.	_√_3 pts
Yes, but in a vague or incomplete way.	___2 pts
No.	___1 pt

D. Is there local support for farming and/or forestry through tax abatements, and/or a dedicated town fund to help purchase or protect prime working land?

Yes — we offer tax abatements and/or a dedicated fund.	_√_3 pts
We have, or are working on, a plan to offer tax abatements and/or a dedicated fund.	___2 pts
No, we offer neither.	___1 pt

E. Does the zoning ordinance zone much of the fringe land as exclusively agricultural (i.e., a holding category) or with a substantial minimum lot size that discourages single-family tract housing and preserves large sites for viable farm use?

The Rural/Agricultural District does have a large minimum lot size, more suitable for agricultural use.	___3 pts
The Rural/Agricultural District permits agricultural use but the minimum lot size is two acres.	_√_1 pt

Smart Growth Principle 4 Score	__12__
Smart Growth	15-13
In Transition	12 - 9
Needs Your Attention	8 - 5

Smart Growth Principle 5:

Provide choices and safety in transportation

Provide safety and choices in transportation to create livable, walkable communities that increase accessibility for people of all ages, whether on foot, bicycle, or in motor vehicles.

A. Which of these options best describes the layout of local streets?

Streets are interconnected, in a clear pattern for getting around the community. ___3 pts
The downtown/village center has a network of streets — but in outlying areas, streets are disconnected, with no clear pattern for getting around. ___2 pts
Streets are disconnected, with no clear pattern for getting around. _√_ 1 pt

B. How has your community planned for future streets?

We have a street network plan. ___3 pts
We have begun working on a plan for future streets. ___2 pts
We have no plan for future streets. _√_ 1 pt

C. How does your community regulate the width of new streets?

Regulations allow different street widths, depending on the character of the area, the projected volume of traffic, and/or the desired speed of traffic. ___3 pts
Regulations allow some variation in street widths, but only under limited circumstances. _√_ 2 pts
No variation in the width of streets is permitted. ___1 pt

D. What provisions has your community made for pedestrians and cyclists?

We have a good network of sidewalks and pedestrian/bike paths, interconnecting much of the community. ___ 3 pts
We have some sidewalks, and a plan for pedestrian/bike paths to connect specific areas of community. ___ 2 pts
We have only some limited sidewalks, and no plan for pedestrian/bike paths. _√_ 1 pt

E. Does your community offer public transportation?

Yes. We have a transit system supported by dedicated revenues. ___ 3 pts
Yes, but local support for the service is discretionary from the general fund. ___ 2 pts
No. _√_ 1 pt

F. Do you require sidewalks and trails in new developments?

Yes. As part of our community plan, we have sidewalk and trail design standards for residential and commercials developments. ___ 3 pts
Yes. We require sidewalks and trails in new residential and commercials developments, but we do not have design standards. ___ 2 pts
No. We have limited requirements for sidewalks. _√_ 1 pt

G. Does your street design enable pedestrian traffic?

Yes. We have a good network of sidewalks and pedestrian/bike paths connecting much of the community including safe and convenient crossings of major roads. ___ 3 pts
Yes. We have some sidewalks, and a plan for pedestrian/bike paths to connect to specific areas of town. ___ 2 pts
We have only some limited sidewalks, and no plan for pedestrian/bike paths. _√_ 1 pt

H. Has your community designated or established safe routes for children to walk or bike to school?

Yes. We have established safe routes to school from all parts of our community that include accessible and readily-visible means of crossing or getting around major barriers such as busy roads. ___ 3 pts

We are aware of the concept, but have not established any safe routes to school. ___ 2 pts

No. We had not established any safe routes to school. _√_ 1 pt

I. Do land use regulations include maximum parking ratios (i.e., a cap on the number of parking spaces that can be built in a particular development) in addition to minimum parking requirements?

Yes. There is a cap on the number of parking spaces ___ 3 pts

No, but most developments don't go overboard with parking. _√_ 2 pts

No, there is no cap and developments end up with a wide expanse of asphalt. ___ 1 pt

J. Is on-street parking allowed in places where it can be safely provided, such as in downtown areas and pedestrian retail districts?

Yes. There is on-street parking in the downtown area and it seems to work for both pedestrians and drivers. ___ 3 pts

Yes. There is on-street parking in the downtown area but there are problems for both pedestrians and drivers. _√_ 2 pts

No. There is no on-street parking in the downtown area. ___ 1 pt

Smart Growth Principle 5 Score	13
Smart Growth	30-26
In Transition	25-17
Needs Your Attention	16-10

Smart Growth Principle 6:

Protect Environmental Quality

Protect environmental quality by minimizing impacts from human activities and planning for and maintaining natural areas that contribute to the health and quality of life of communities and people in New Hampshire.

A. What action is your community taking to protect natural areas?

We have strong provisions to protect natural areas — including wetlands, wildlife habitat, and sites for rare plants — in site-plan review and/or subdivision regulations. _√_ 3 pts

We have made provisions to protect some, but not all, natural areas in site-plan review and/or subdivision regulations. ___ 2 pts

We have made no provisions to protect natural areas in site-plan review or subdivision regulations. ___ 1 pt

B. Has your community identified its natural assets (rivers, mountains, wetlands, open space, agricultural lands, viewsheds, agricultural lands) and taken steps to restore or protect them?

Yes, we highlight our natural assets in our master plan and have taken steps to restore/protect them (e.g., water and energy efficiency programs, conservation easement programs, urban service boundaries, etc.) _√_ 3 pts

Yes, we highlight our natural assets, but we have not taken any steps to restore/protect them. ___ 2 pts

No. We do not highlight our natural assets in our planning efforts. ___ 1 pt

C. Do land use regulations require developers to consider connecting open spaces and greenways to existing destinations and open space reservations? **<u>*1.5 pts.</u>**

Yes. This is a requirement. ___3 pts

This is not a requirement but we offer incentives for those that do. ___2 pts

No, this is not considered as part of the review process. ___1 pt

D. Do local land use regulations provide for "conservation subdivisions" or "cluster subdivisions" as a matter of right (versus requiring a conditional use permit or special exception)? **<u>*2.5 pts.</u>**

Yes. There are very few hurdles in the conservation/cluster subdivision process. ___3 pts

Conservation/cluster subdivisions are permitted but there are obstacles for the applicant. ___2 pts

Conservation/cluster subdivisions are not permitted or there are numerous obstacles including that they are permitted only by conditional use or special exception. ___1 pt

E. Have the community's development regulations been revamped recently to encourage or require best management practices (BMPs) for water quality? Does this include a water-quality or aquifer ordinance?

Yes. _√_ 3 pts

Our ordinances do address water quality issues but there are some gaps in them. ___2 pts

No. ___1 pt

F. Does the community have guidelines and incentives for designing development sites and buildings for energy efficiency?

Yes. This is a requirement. ___3 pts

This is not a requirement but we offer incentives for those that do. ___2 pts

No, this is not considered as part of the review process. _√_ 1 pt

Smart Growth Principle 6 Score	14

Smart Growth	18-15
In Transition	14-10
Needs Your Attention	9 - 6

Smart Growth Principle 7:

Involve the community

Involve the community in planning and implementation to ensure that development retains and enhances the sense of place, traditions, goals, and values of the local community.

A. Which of these options best describes the conditions of historic buildings in your community?

Most are in use and well-maintained. _√_ 3 pts
Most are in poor condition, but they are in use. ___2 pts
Most historic buildings are vacant or have been demolished ___1 pt

B. Does your community have a set of clear design guidelines so streets, buildings, and public spaces work together to create a sense of place? *2.5 pts.

Yes. We have a set of design guidelines that connect our street, buildings, and public spaces. ___ 3 pts
Yes, but our design guidelines are vague or confusing. ___ 2 pts
No. We do not have a set of design guidelines . ___ 1 pt

C. Does your community sponsor events to celebrate its cultural heritage, natural assets or community character?

Yes. We have a number of fairs, concerts, events celebrating our community heritage, natural assets, or character. ___ 3 pts
Yes, we have one or two events celebrating our community heritage, natural assets, or character. _√_ 2 pts
No. We do not have such events. ___ 1 pt

D. What action is your community taking to protect historic buildings and other features?

We have a defined historic district, along with guidelines for development within it. _√_ 3 pts
We have highlighted the importance of historic buildings and other features, but we have no specific measures to maintain or enhance them. ___ 2 pts
We have taken no action on historic buildings and features. ___ 1 pt

E. To what extent was the public involved in developing your most recent the community plan?

There was a lot of public involvement – committee, workshops, survey work, well-attended public meetings. _√_ 3 pts
Some public meetings were well attended, but overall there was not a lot of public involvement in developing the plan. ___ 2 pts
Only the required number of public hearings were held. ___ 1 pt

F. Are citizens active in community planning, development, and resource protection?

Yes. Many are involved at the municipal level; there are also citizen groups working on specific areas. ___ 3 pts
There is some local participation in a few aspects of community planning. _√_ 2 pts
No. There is no local community development organization, downtown organization, historical society, community planning, organization, or land trust. ___ 1 pt

Smart Growth Principle 7 Score	15.5
Smart Growth	18-15
In Transition	14-10
Needs Your Attention	9 - 6

Smart Growth Principle 8:

Manage growth locally

Manage growth locally in the New Hampshire tradition, but work with neighboring towns to achieve common goals and address common problems more effectively.

A. Do elected and appointed board members and staff in nearby communities have opportunities to meet and network with each other on a regular basis?

Yes. There are a number of regular forums and meetings in which elected and appointed board members and staff have opportunities to meet and network with each other on a regular basis. ___ 3 pts

Staff members from different communities in the region meet periodically, but elected and appointed board members from different communities hardly ever meet. _√_ 2 pts

No. Elected and appointed board members and staff from different communities rarely meet. ___ 1 pt

B. Do the towns, cities, and counties in your area have any formal cooperative agreements on issues such as land use, transportation, housing, infrastructure, emergency services, other services, revenue sharing, or economic development?

Yes. Local governments in our region have intergovernmental agreements in at least three of the following areas: land use, transportation, housing, infrastructure, emergency services, other services, revenue sharing, or economic development. _√_ 3 pts

Local governments in our region have intergovernmental agreements in one or two of the following areas: land use, transportation, housing, infrastructure, emergency services, other services, revenue sharing, or economic development. ___ 2 pts

No. We have no formal agreements between local governments on planning issues in our area. ___ 1 pt

Smart Growth Principle 8 Score	5
Smart Growth	6
In Transition	5 - 3
Needs Your Attention	2

This checklist was adapted from the following sources:

The Vermont Smart Growth Scorecard (2000), http://www.epa.gov/dced/scorecards/VTscorecardvtfonsprawl.pdf

The Colorado Smart Growth Scorecard (2003), http://www.epa.gov/dced/scorecards/Colorado_Scorecard.pdf,

Comprehensive Smart Growth Checklist - Prepared by Nashua Regional Planning Commission Adopted for use in Preparing A Master Plan CD-ROM (2004), http://www.nh.gov/oep/resourcelibrary/referencelibrary/m/masterplan/preparingamasterplan/documents/smartgrowthchecklist.pdf.

Smart Growth Assessment:

Checklist Answers and Documentation

This Section addresses each of the checklist questions with statements from the Master Plan, Zoning Ordinance, Regulations (Site Plan and Subdivision), identified patterns, or observations from the Planning Board [PB]. Those statements or parts of statements that contradict the principle are in red text.

1) Compact Settlement Patterns

A) **How visible is the edge of your downtown/village center (or centers, if your municipality has more than one)?**

a) [Patterns] The edges are fairly clear.
b) [MP IV. Land Use] At present, Gilmanton has two village districts with higher densities of housing units and other activities.
c) [ZO II.A.] Village - The Gilmanton Corners Village is located in the vicinity of the intersection of Route 140 and Province Road (Route 107). The Gilmanton Iron Works Village is located in the vicinity of Route 140 and Elm Street.

B) **Where is most commercial and industrial growth occurring?**

a) [PB] What little has occurred has been in Business District along NH Route 106 and some efforts in the Light Business District.

C) **Where is most new residential growth occurring?**

a) [PB] Residential development has been sporadic and scattered.
b) [PB] When residential development rebounds, it is anticipated that it will occur along Stage Road and Stone Road, with easy access to NH Routes, 107, 129, and points south.

D) **Does your master plan include specific language that describes a desired pattern of development? If so, what does this language say?**

a) [MP I. Vision] As our population grows, sustainable residential growth should be concentrated in areas of the town where such growth will allow public services to be provided in a cost effective, efficient manner.
b) [MP III. Introduction; Recommendation from 1993 MP] These include the adoption of an open space conservation subdivision that allowed more concentrated density of lots with preservation of, at minimum, half the buildable acreage.
c) [MP III. Introduction; Recommendation from 1993 MP] Community attitudes remained unchanged on retaining the rural atmosphere of the community. The public felt that growth should be encouraged around the village centers and less in the rural and conservation zones.
d) [MP III. Introduction; Recommendation from 1993 MP] Expansion of the commercial zoning in the community by the creation of light business district in the Corners village district.
e) [MP IV. Land Use] Increase densities in areas of existing development.

E) **Is there a distinct pattern to densities in local zoning — from higher densities in compact centers to lower densities in outlying areas?**

a) Somewhat. Conservation District has 10 acre minimum lot size, Rural District has 2 acre minimum lot size, and all other districts have a 1 acre minimum lot size.
b) [ZO II.A.] Village: The minimum acreage in these districts is one acre with 125' of road frontage on a Class V or better road.
c) [ZO II.A.] Residential Lake District: The purpose of the Residential Lake District is to allow for higher density single-family dwellings while protecting the water supply, lake and environment.

F) **If your community provides public sewer and/or water, how are line extensions managed?**
   a) No public sewer in town.
   b) No community septic in the Villages.

G) **Where are your community's public buildings (including schools and post offices), and where are they planned?**
   a) [Patterns] Most facilities are in the Villages or along state roads. The new public safety building is on the edge of the Corners Village District along NH Route 140.
   b) MP does not refer to a need for future facilities.

H) **Does development along state roads occur in a node or strip pattern of development?**
   a) [Patterns] Development along state roads is in the strip pattern (right along the road, not pedestrian-friendly).
   b) [Patterns] The Village District boundaries promote the concept of strip development.
   c) The Light Business and Business Districts have the potential to impart a more nodal character (clusters of buildings, walkable) to future development.

I) **Do land use regulations establish minimum densities to promote efficient use of lands designated for higher densities?**
   a) No.

J) **Do subdivision regulations allow the planning board to require the connection of subdivision streets to existing streets and the stubbing of streets to allow connections to future subdivision developments? What about the provision of interparcel connections between individual developments, where compatible?**
   a) [Subdivision] No references to this concept were found.

Smart Growth Assessment:

Checklist Answers and Documentation

2) *Human Scale*

A) **What scale of commercial and industrial growth is permitted?**

a) [MP VI] Although the community is open to new technologies and opportunities, the preservation of Gilmanton's rural character is always the context in which its residents evaluate them.

b) [ZO II.A.] Village: The objectives of the Village Districts are to continue the mixed-use village character, to preserve existing structures, to minimize vehicular congestion and provide maximum pedestrian access, and to preserve the significant historic value.

c) [Sub III] Considerations may include; 3. Provision for the harmonious development of the town and its environs.

d) [Sub III] An Explanation of whether there will be requirements or plans for the proposed siting of the buildings, landscaping, natural buffers and other features designed to integrate the subdivision with the neighborhood.

e) [SPR VII] 3. A Site Plan and supporting data which shall include the following information and meet the following requirements, when required by the Board: N. Proposed structures, showing location, proposed finished grade at foundation, floor elevation, and an elevation view of all the buildings indicating their height, bulk and surface treatment.

B) **Do townspeople have easy walking access to public parks and playgrounds?**

a) [Patterns] Although many have access to woods and trails, to access parks and playgrounds, most have to drive.

C) **How do local regulations provide for open space in new developments?**

a) [ZO V Open Space Subdivision] A. Objective: To accomplish this goal, greater flexibility and creativity in design is encouraged. Specific objectives are as follows: 7. To provide for outdoor recreational needs of the subdivision's residents, including trails, scenic beauty, and greens or playgrounds for larger subdivisions.

b) Connectivity is only addressed in Open Space Subdivision.

D) **Do the future land use plan and zoning ordinance allow for compatible, small-scale neighborhood commercial uses (e.g., corner stores) adjacent to or within residential neighborhoods?**

a) [ZO II A] Village: The Village Districts have a mixed-use character consisting of concentrated community living, small-scale retail and service businesses, and civic uses.

b) [ZO V Open Space Subdivision] A. Objective: To accomplish this goal, greater flexibility and creativity in design is encouraged. Specific objectives are as follows: 10. To create compact neighborhoods accessible to open space amenities and with a strong community identity and quality of life.

c) [MP Introduction: 1993 Recommendations] Expansion of the commercial zoning in the community by the creation of light business district in the Corners village district.

E) **Do all (or most) zoning districts require a minimum open space ratio (i.e., percentage of land area for each development that must be open space)?**

a) [ZO] Only under Open Space Subdivision.

3) *Mix of Uses*

A) **Where are commercial/industrial and residential uses located in relation to each other?**

a) [ZO Article IV Uses] Single- and Two Family Residential are permitted in the Business and Light Business Districts.

b) Multi-Family Residential is either not permitted or only permitted by Special Exception in these districts.

c) Most businesses (and Multi-Family Residential) are either not permitted or only permitted by Special Exception in the Village Districts.

B) **Can townspeople meet most daily shopping needs (groceries, hardware, etc.) in the community?**

a) [PB] No.

C) **How does local zoning encourage business development in the downtown/village center?**

a) [ZO Article IV: Uses] The only permitted uses in the Village Districts are Agricultural, Forestry, and Home Occupations. Retail, offices, and services require a Special Exception.

D) **Which option best describes the mix of housing types in your community?**

a) [Patterns] There is very little diversity in housing, with 94% being single family residential.

b) [Patterns] There is no housing for the elderly.

c) [Patterns] There is little affordable housing.

E) **How has your community planned for future housing needs, especially in and around your downtown/village center?**

a) [MP Vision] Attract a mixed use of residential and commercial development. Affordable and elderly housing is an important part of this mix.

b) [MP IV Land Use] The community has a need to create housing opportunities for the elderly and low income, so they are not forced to move out of town.

c) [MP IV Land Use] Elderly housing or affordable housing units should be developed in and around the village districts.

d) [MP VIII Infrastructure] C.2 The average age of the population of the Town is increasing; The Town must work to accommodate the change through increased age appropriate housing, medical services, public transportation, and community services and activities

e) [MP VIII Infrastructure] C.4. Gilmanton is a bedroom community: As other surrounding communities become increasingly developed and their housing costs rise disproportionately due to supply and demand forces, it is envisioned that demand for new housing construction in Gilmanton will continue to grow.

f) [MP VIII Infrastructure] 14. Encourage affordable housing for seniors and families.

F) **Do local regulations enable your community to meet diverse housing needs and ensure long-term affordability?**
   a) [ZO Article IV: Table of Uses] Two-Family Residential (which could include Accessory Apartments) is permitted throughout most of town, including the Villages.
   b) [ZO Article IV: Table of Uses] Multi-Family Residential is permitted in much of town but only by Special Exception.
   c) While there is a strong vision of mixed housing for its residents, the community has yet to achieve its stated goals.

G) **Does your community provide incentives to support affordable housing (density bonuses, fee waivers, higher density zones, fast tracking)?**
   a) [ZO] No incentives are provided to support affordable housing.

H) **If the community has a downtown/village district, are residential uses allowed in the central business zoning district?**
   a) [ZO Article IV: Uses] Single Family and Two-Family Residential are permitted in the Village District; Multi-Family Residential requires a Special Exception.

I) **Do the provisions within at least some of the residential zoning districts allow for a wide range of housing types by right (versus requiring a conditional use permit or special exception)?**
   a) [ZO Article IV: Uses] Single Family and Two-Family Residential (which could include Accessory Apartments) are permitted in the Village District; Multi-Family Residential requires a Special Exception.

J) **Does the zoning ordinance allow for "accessory apartments" within single-family residential zoning districts?**
   a) [ZO Article V: Uses] Two-Family Residential (which could include Accessory Apartments) is permitted in the Village and Rural Districts.

4) *Working Landscape*

A) **Where is most development in your community located?**

a) [Patterns] While there is some concentration of development in the villages and around the lakes, most development in Gilmanton is scattered along the major roadways.

B) **What strategies does your master plan have for protecting farmland?**

a) [MP Vision] Encourage more traditional land uses and patterns.

b) [MP III Community Survey] This survey showed that a significant number of respondents wanted the town to adopt land use controls to preserve the rural character by protecting open space, agricultural lands and forests. Growth should be encouraged around the village centers and less in the rural and conservation zones.

c) [MP Land Use] Suggestions have been made to encourage farming by providing incentives to make farming more profitable and less costly. Suggestions also include zoning changes based on working farms overlay districts, or the allowance of special cluster type dwelling for farm employees and family.

d) [MP IV] Within the last 10 years the Town has reserved several additional parcels as Town Forests. The Conservation Commission has initiated a program to survey the Town forests and develop forest management plans which will allow for periodic sustainable timber harvesting together with recreational uses and habitat maintenance.

C) **Does your master plan map the location of farms and prime agricultural soils?**

a) [MP] Through the Natural Resources Inventory (NRI) farms are identified and mapped.

b) [MP] The Agricultural Soils were identified in the NRI but were unable to be mapped at the time.

c) In recent years the Conservation Commission and Planning Board have developed a substantial collection of maps showing a variety of natural resources and these are on display in the town hall.

D) **Is there local support for farming and/or forestry through tax abatements, and/or a dedicated town fund to help purchase or protect prime working land?**

a) [MP IV] Within the last 10 years the Town has reserved several additional parcels as Town Forests. The Conservation Commission has initiated a program to survey the Town forests and develop forest management plans which will allow for periodic sustainable timber harvesting together with recreational uses and habitat maintenance.

b) [PB and CC] There is some funding through the Land Use Change tax; some felt that a larger percentage of these funds should go towards protection.

E) **Does the zoning ordinance zone much of the fringe land as exclusively agricultural (i.e., a holding category) or with a substantial minimum lot size that discourages single-family tract housing and preserves large sites for viable farm use?**

a) [ZO Article IV] The Conservation District has a minimum lot size of 10 acres. A large majority of the town is in the Rural District, with a two acre minimum.

b) [PB] Concern was expressed that several local farms in the Rural District may be sold in the near future without any restrictions on future development.

5) Choice and Safety in Transportation

A) **Which of these options best describes the layout of local streets?**

a) [Patterns] There is very little connectivity between streets in Gilmanton.

B) **How has your community planned for future streets?**

a) There is no street network plan.

C) **How does your community regulate the width of new streets?**

a) [Sub IV Street Design] No Street or highway right-of-way shall be less than fifty feet and surface widths shall be as shown in Appendix Fig. 2 unless required to be more.

b) [ZO Article V Open Space Subdivision] A. Objective: To accomplish this goal, greater flexibility and creativity in design is encouraged. Specific objectives are as follows: 9. To provide greater efficiency in the siting of services and infrastructure by reducing road length and width and utility runs.

c) [ZO] Flexibility in road design is only permitted for Open Space Subdivisions.

D) **What provisions has your community made for pedestrians and cyclists?**

a) [ZO V Open Space Subdivision] A. Objective: To accomplish this goal, greater flexibility and creativity in design is encouraged. Specific objectives are as follows: 8. To provide for a town-wide trail network for the health, enjoyment and safe travel of residents.

b) [ZO V Open Space Subdivision] B. Applicability: 2. Required for Special Land Features - The Planning Board may require an applicant to use an Open Space Subdivision design if the property is 20 acres or more and possesses one or more of the following special features, shown on maps available at the Gilmanton Town Office: d. a portion of a snowmobile trail network shown on the most recent edition of the "Trail Map" published by the Gilmanton Snowmobile Association.

c) [ZO V Open Space Subdivision] C. Density: 4. The Planning Board may approve an additional density bonus allowing up to 20% more b. providing public access to trails or dedicated conservation areas.

d) [SPR VII] 3. A Site Plan and supporting data which shall include the following information and meet the following requirements, when required by the Board: p. Location of Proposed sidewalks, fences and screening.

e) [SPR VIII Traffic and Parking] 3. In the event that shoppers, employees, and /or residents are anticipated to require pedestrian access from the street, provisions shall be made for sidewalks running from the street side of the establishment. Sidewalks shall be provided for pedestrian traffic to provide connection between the main entrance of businesses, housing or industrial establishments and parking areas.

f) [Patterns] While there is a network of woods trails, very few sidewalks exist in Gilmanton.

E) **Does your community offer public transportation?**

a) None currently exists.

F) **Do you require sidewalks and trails in new developments?**

a) [SPR VII] 3. A Site Plan and supporting data which shall include the following information and meet the following requirements, when required by the Board: p. Location of Proposed sidewalks, fences and screening.

b) [SPR VIII Traffic and Parking] 3. In the event that shoppers, employees, and /or residents are anticipated to require pedestrian access from the street, provisions shall be

made for sidewalks running from the street side of the establishment. Sidewalks shall be provided for pedestrian traffic to provide connection between the main entrance of businesses, housing or industrial establishments and parking areas.

c) No sidewalks are required.

d) [ZO V Open Space Subdivision] C. Density: 4. The Planning Board may approve an additional density bonus allowing up to 20% more b. providing public access to trails or dedicated conservation areas.

G) **Does your street design enable pedestrian traffic?**

a) [Patterns] No, there is very little connectivity between local streets.

H) **Has your community designated or established safe routes for children to walk or bike to school?**

a) [PB] No, the school can only be accessed by NH Route 140 and is not near many residences.

I) **Do land use regulations include maximum parking ratios (i.e., a cap on the number of parking spaces that can be built in a particular development) in addition to minimum parking requirements?**

a) [ZO] There is no mention of maximum number of parking spaces.

J) **Is on-street parking allowed in places where it can be safely provided, such as in downtown areas and pedestrian retail districts?**

a) [ZO Article III] Adequate off-street loading and parking shall be provided whenever any new use is established or any existing use is enlarged in accordance with the following specifications. 1. All new construction of institutional, commercial or industrial uses requiring off-street loading facilities shall provide such facilities so that delivery vehicles are parked outside of the street right-of-way.

b) [ZO Article III] 2. All proposed new development shall provide for adequate off-street parking spaces in accordance with the Site Plan Regulations.

c) [SPR VIII] 5. Sufficient off-street loading and/or unloading space must be provided, including off-street areas for maneuvering of anticipated trucks or other vehicles. Maneuvers for parking and/or loading or unloading must not take place from a public street.

6) ***Environmental Quality***

A) **What action is your community taking to protect natural areas?**

a) [MP III Introduction] These include the adoption of an open space conservation subdivision that allowed more concentrated density of lots with preservation of, at minimum, half the buildable acreage.

b) [MP IV Land Use] The community favors the establishment of conservation easements, encourages the donation of such easements

c) [MP IV Land Use] It is critically important the Town protect the lands of ecological sensitivity in the planning process and also by acquisition. Those lands or areas designated in the 1993 Master Plan Update and by the recent Natural Resource Inventory, appended hereto, should be high priorities for the community to protect and preserve.

d) [MP V Growth Management] Anyone with plans to develop in Gilmanton should be sensitive to the rural character of this area. To do this they should attempt to provide open land in their subdivisions to be used for trails, forestlands or other use, and limit the potential for further subdivisions.

e) [MP V Growth Management] It is crucial that the Town consider rezoning areas of particular importance immediately.

f) [MP VI] Within the last 10 years the Town has reserved several additional parcels as Town Forests. The Conservation Commission has initiated a program to survey the Town forests and develop forest management plans which will allow for period sustainable timber harvesting together with recreational uses and habitat maintenance.

g) [MP VI] Unless action is taken to either purchase important tracts of land or acquire conservation easements over them, development will impinge on the most valued scenic sites.

h) [MP VI] The Town now sets aside a portion of the land use change tax for the acquiring and monitoring of open space lands.

i) [MP VI] It is essential that the Town provide the capacity for long-term monitoring of properties subject to conservation easement, as well as for oversight of Town-owned lands.

j) [MP VI] The Conservation Commission has prepared a detailed natural resources inventory which should serve to guide the planning board.

k) [MP VII] 2. With respect to individual Class VI roads, with respect to building permits, an inventory is needed including each road with the following information:
e) Whether the road is bisected by, or proximal to a wetland at any point that would be affected by a reclassification of the road by cause of erosion, degredation of water quality by vehicular use, or any other groundwater impact.

l) [MP VIII] 2. Continue efforts to preserve land for conservation, recreation and preservation of scenic areas and wildlife habitat; provide the Planning Board with authority to enhance preservation of special places by adopting overlay zones for wetlands, steep slopes and ground and surface water resources; encourage owners of parcels of more than ten acres to take advantage of current use tax program to reduce tax burdens and make them less likely to sell: and connect green spaces throughout the Town.

m) MP VIII] 3. Consider bonding or other financial incentives for conservation lands.

n) [ZO V. Open Space Subdivision] A. Objective: To accomplish this goal, greater flexibility and creativity in design is encouraged. Specific objectives are as follows: (especially Objectives 1-5 and 11).

o) [ZO V. Open Space Subdivision] B. Applicability: 1. Twenty Acre Minimum - In any residential or commercial subdivision consisting of 20 acres or more, an applicant may

apply for an Open Space Subdivision under this Article. The minimum acreage may be waived by the Planning Board in instances where an applicant demonstrates that the criteria in Article V. A. are met.

B) **Has your community identified its natural assets (rivers, mountains, wetlands, open space, agricultural lands, viewsheds, agricultural lands) and taken steps to restore or protect them?**
   a) [MP] Identified as part of the NRI (2004)
   b) See 6A above.
   c) Identification of natural resources is an important element of the Open Space Subdivision process.
   d) Town forests.
   e) Conservation Commission works with several organizations to protect lands through easements.

C) **Do land use regulations require developers to consider connecting open spaces and greenways to existing destinations and open space reservations?**
   a) [ZO V] F. Conservation Area Location and Design: 2. In evaluating the acceptability of proposed Conservation Area(s) the Planning Board shall consider the extent to which the location and design of the area achieves these objectives: (e.) Linkages or contiguity with existing or potential Conservation Areas on abutting properties are provided;
   b) Consideration of linkages is limited to Open Space Subdivision.

D) **Do local land use regulations provide for "conservation subdivisions" or "cluster subdivisions" as a matter of right (versus requiring a conditional use permit or special exception)?**
   a) Open Space Subdivision does not require a Conditional Use Permit or Special Exception; however, it is not the standard practice.

E) **Have the community's development regulations been revamped recently to encourage or require best management practices (BMPs) for water quality? Does this include a water-quality or aquifer ordinance?**
   a) [PB] A Groundwater Protect Ordinance will be on the ballot in March 2011.

F) **Does the community have guidelines and incentives for designing development sites and buildings for energy efficiency?**
   a) No guidelines or incentives for energy efficiency development were found.

7) *Involve the Community*

A) **Which of these options best describes the conditions of historic buildings in your community?**
   a) Most historic buildings in Gilmanton are in use and fairly well maintained.

B) **Does your community have a set of clear design guidelines so streets, buildings, and public spaces work together to create a sense of place?**
   a) Gilmanton has Historic District Regulations governing buildings and sites but not for streets or public places.

C) **Does your community sponsor events to celebrate its cultural heritage, natural assets or community character?**
   a) Yes; these groups and events include the Gilmanton Historical Society, Old Home Days, Fourth of July celebration, contra dances.

D) **What action is your community taking to protect historic buildings and other features?**
   a) No protection or preservation actions were noted.

E) **To what extent was the public involved in developing your most recent the master plan?**
   a) [MP Process] The MP Update Committee was comprised of 22 community members, beyond the Planning Board. A survey was distributed to the community and several public hearings were held.

F) **Are citizens active in community planning, development, and resource protection?**
   a) Somewhat.

8) Manage Growth Locally (but work with neighbors)

A) **Do elected and appointed board members and staff in nearby communities have opportunities to meet and network with each other on a regular basis?**

a) Some residents are involved with regional organizations such as the Lakes Region Planning Commission and the Belknap County Economic Development Council.

B) **Do the towns, cities, and counties in your area have any formal cooperative agreements on issues such as land use, transportation, housing, infrastructure, emergency services, other services, revenue sharing, or economic development?**

a) The town has agreements with neighboring communities regarding mutual aid.
b) There is involvement with the Belknap Range Association and the Lakes Region Conservation Trust for land protection.
c) There is some municipal and local involvement with the Belknap County Economic Development Council.
d) There is local involvement and support of regional planning efforts through LRPC.
e) There are opportunities for greater involvement on regional transportation issues through the Transportation Advisory Committee and the Region 3 Regional Coordinating Committee for public transportation.

Review of Land Use Planning Documents for Gilmanton, New Hampshire with respect to Wildlife Habitat and Natural Resource Protection

Prepared by the
Audubon Society of New Hampshire
Conservation Department

in consultation with the
Gilmanton Planning Board and Gilmanton Planner
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Analysis by Topic

The intent of this review is to assess the current level of protection for wildlife habitat and natural resources provided by the Town of Gilmanton's land use regulations and identify additional opportunities for regulatory protection. The review included the following:

- Master Plans (adopted 1993 and 2005);
- Hazard Mitigation Plan (adopted 2005);
- Natural Resources Inventory (prepared 2004);
- Zoning Ordinance (adopted 1970, revised 1990, 1993, 1994, 1997, 1998, 2000, 2001, 2004, 2007, 2008, 2010);
- Site Plan Review Regulations (adopted 1984, revised 1990, 1994, 1997, 1998, 2000);
- Subdivision Regulations (adopted 1969, revised 1989, 1991, 1994, 1998, 1999, 2009).

This chapter provides a comprehensive analysis of current provisions for protecting important natural resources and wildlife habitat in the Town's land use planning documents. Some topics are interrelated and provide alternate strategies for protecting a given resource or addressing a particular problem, such as sprawl. Each section includes a brief description of the topic and how it affects human quality of life and wildlife survival, a brief summary of pertinent provisions in current documents and recommendations for revisions if stronger protections are desired by the Town. Legal review of proposed revisions is always advisable.

Agriculture and Productive Soils

Agriculture is an important component of New Hampshire's economy and environment, and makes vital contributions to the State's food supply. New Hampshire's glacial history has left the state with limited areas of productive soils suitable for agriculture. These soils are critical to the future of food production in New Hampshire. Prime agricultural soils and soils of statewide importance are included in the NH Natural Services Network. Agricultural lands are important to native wildlife by providing breeding habitat for grassland birds, migration stopover habitat for waterfowl, and wintering habitat for wild turkeys.

The New Hampshire Natural Services Network identifies 2709 acres of productive soils in Gilmanton (approximately 7% of Town area), and the Natural Resource Inventory indicates that approximately 5% of the Town's land area is in agricultural use at the present time.

Current Provisions

The Master Plan cites the importance of agriculture expressed by Gilmanton citizens, and suggests considering an overlay district to protect agricultural lands and providing incentives to maintain active agriculture. The Natural Resource Inventory cites the importance of agriculture to the Town's economy, rural character, and quality of life, recommends protection of important farmland soils, and includes agricultural lands in Local Resource Protection Priorities. The Zoning Ordinance includes providing for agricultural uses in the purposes of Rural and Conservation districts and Open Space Subdivisions.

Recommendations

Master Plan: None

Zoning Ordinance:

- Consider including protection of important natural resources, including productive soils, in the purposes of the Zoning Ordinance (Article I).
- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).
- Consider adopting an agricultural overlay district to protect agricultural lands and productive soils OR protecting agricultural lands and productive soils in a comprehensive natural resources overlay district (Article II). (The "Agricultural Incentive Zoning" [Chapter 1.7] of *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model performance standards for agricultural zones.)
- Consider permitting Open Space subdivisions by right in the Conservation and Rural districts, with conventional subdivisions allowed by Special Exception (Article IV, Table 1).

Subdivision Regulations:

- Consider including provision for protecting natural resources, including agricultural lands and productive soils in Purpose (Section I B).

- Consider requiring Preliminary Conceptual Consultation for all subdivisions in Conservation and Rural districts OR for subdivisions involving agricultural lands and soils (Section II).

- Consider including preservation of agricultural lands and productive soils among considerations of impacts during Design Review Phase (Section III A).

- Consider including agricultural lands and productive soils among the features required for inclusion on the Design Review Phase Layout (Section III C 1 d.)

Site Plan Review Regulations:

- Consider including protection of important natural resources, including agricultural lands and productive soils, in the Purpose of the Site Plan Review Regulations (Section II).

- Consider requiring Pre-Submission Discussion for all site plans in Conservation and Rural districts OR for site plans involving agricultural lands or productive soils (Section IV).

- Consider adding agricultural lands and productive soils to features for which location and boundary information is required on a Site Plan (Section VII B 3 j).

Actions and Policies

- Consider expanding the Conservation District. (See Section 5 of this document.)

Energy Efficiency

Energy efficient design of neighborhoods and buildings has long-term economic benefits for residents and taxpayers as well as environmental benefits of resource conservation and reduced pollution. Energy efficiency benefits wildlife by decreasing the habitat loss and degradation associated with producing electricity and the global impacts of burning fossil fuels.

Current Provisions

Energy efficiency is not addressed in any of Gilmanton's land use planning documents.

Recommendations

Master Plan:

- Consider adding language to the Vision that addresses promotion of energy efficiency.
- Consider adding recommendations pertaining to energy efficiency of Town infrastructure, equipment, and activities.
- Consider adopting a recommendation to encourage landscaping designs that reduce heating and cooling costs.

Zoning Ordinance: None

Subdivision Regulations:

- Consider adding provision for encouraging energy efficiency in the Purpose (Section I B).
- Consider including energy conservation strategies among considerations for discussion during Design Review Phase (Section III A).
- Consider including lighting plan for proposed streets in Submission and Information Requirements (Section III C).

Site Plan Review Regulations:

- Consider including encouraging energy efficiency in the Purpose (Section II).
- Consider including description of energy conservation features of exterior lighting plan in Application Requirements (Section VII B 3 q).
- Consider adopting design standards for outdoor lighting (Section VIII D). (The New England Light Pollution Advisory Group [NELPAG] provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ [www.cfa.harvard.edu/nelpag/ordbylaw.html] and the International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. [www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php])

- Consider strengthening provisions to encourage the retention of natural vegetation, use of native species, and use of landscaping to reduce heating and cooling costs; and discourage use of species that require significant inputs of water and nutrients (Section VIII C). ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision regulations pertaining to landscaping. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast.)

Floodplains

Floodplains are low-lying lands where water spreads out after overflowing the banks of streams and rivers during periods of snowmelt or heavy precipitation. In addition to providing critical storage areas for floodwaters, they provide the surface over which a river's meanders can shift over time. Development in floodplains may result in damage to private property and public investments such as roads and utilities, risks to public health and safety, and increased flooding downstream. Floodplains are included in the NH Natural Services Network as Flood Storage Areas. Floodplains provide important habitat for furbearing mammals, a number of amphibians, several species of turtles, and numerous breeding and migrating birds.

Gilmanton's topography and location in the headwaters of several watersheds results in limited floodplain area within the Town. Nighthawk Hollow Brook, Ayers Brook, and the Suncook River have small areas of associated floodplain.

Current Provisions

Master Plan Vision encourages wise stewardship of the Town's important ecological resources. Gilmanton's Hazard Mitigation Plan cites flooding as a possible hazard of infrequent and mild occurrence. Zoning Ordinance includes a Floodplain Management Ordinance. Subdivision Regulations state that floodplains present problems sufficient to endanger health, life, or property, and lands in peril from flood hazard shall not be platted.

Recommendations

Master Plan (Hazard Mitigation Plan):

- Consider including a map of natural hazards identifying areas prone to flooding as well as formally recognized floodplains.
- Consider acknowledging that the frequency and intensity of major precipitation events appear to be increasing.

Zoning Ordinance: None

Subdivision Regulations:

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation (Section II).
- Consider including soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation in Submission and Information Requirements for Preliminary Conceptual Consultation Phase (Section III C 1 d).

Site Plan Review Regulations:

- Consider requiring a Pre-Submission Discussion for site plans involving soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation (Section IV).

Forests and Forestry

Forests provide the natural vegetation for most of New Hampshire's landscape. They play important roles in providing clean air and water, and opportunities for recreation; moderating climate; protecting watersheds; and contributing to aesthetic values and rural character. Forestry is a significant component of New Hampshire's economy, providing fuel, fiber, and solid wood products to state, regional, national, and international markets. Forests provide essential habitat for the majority of New Hampshire's wildlife species. Harvesting patterns contribute to the diversity of forest age classes, species compositions, and structures on the New Hampshire landscape, providing diverse habitats for native wildlife.

Gilmanton is approximately 84% forested, and includes nine town forests, three state forests and portions of a fourth, and 13 privately owned registered Tree Farms.

Current Provisions

The Master Plan acknowledges the importance of forestry as a land use and the value of forests for wildlife habitat and recreation, and recommends strategies to protect forest uses. The Natural Resources Inventory cites the importance of forests in providing numerous natural services and economic benefits, and includes goals and objectives for maintaining the integrity of forest ecosystems in general and for managing forests to meet human needs. The Hazard Mitigation Plan considers Wildfire a possible hazard with moderate vulnerability, and includes forest management as a recommended mitigation project. The Zoning Ordinance includes forestry as a purpose of the Rural and Conservation districts and Open Space Subdivisions; requires a description of tree cover in applications for site plans and special exceptions; and requires that conservation areas in Open Space Subdivisions be large enough to sustain forestry operations. The Subdivision Regulations provide for review of forest productivity as a condition of Design Review Approval, and include provisions for Woodlot Subdivisions of at least 10 acres with deeded access and deed restrictions. The Site Plan Review and Earth Excavation regulations provide for requiring documentation of forest productivity at the discretion of the Planning Board. The Earth Excavation Regulations include preservation of forests in the Purpose.

Recommendations

Master Plan:

- Consider incorporating the Town Forest Recommendations from the Natural Resources Inventory directly into the Master Plan Recommendations.
- Consider including a map of natural hazards identifying areas vulnerable to wildfire in the Hazard Mitigation Plan.

Zoning Ordinance:

- Consider including protection of important natural resources, including forests, in the purposes of the Zoning Ordinance (Article I).
- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).

- Consider adopting overlay districts to address site-specific hazards (i.e., Steep Slopes, Wild Fire hazard areas) (Article II).

- Consider establishing a Forest Conservation District, with a larger (e.g., 20- to 50- acre) minimum lot size, in appropriate areas, or a natural resources overlay district that addresses large unfragmented forest blocks (Article II). (The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a useful model [www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc]).

- Consider permitting Open Space subdivisions by right, but conventional subdivisions by Special Exception in the Conservation and Rural districts (Article IV, Table 1).

- Consider adopting a *maximum* front setback for the Conservation and Rural districts to minimize fragmentation effects (Article IV B, Table 2).

Subdivision Regulations:

- Consider including provision for protecting natural resources, including forests in Purpose (Section I B).

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving forest lands of 12 acres or more (Section II).

- Consider adopting special standards for subdivisions in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands (Section VI). Such standards might include maximum distance from collector road, maximum driveway length, on-site water supply, and landscaping specifications. (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.)

Site Plan Review Regulations:

- Consider requiring Pre-Submission Discussion for site plans involving forest lands of 12 acres or more (Section VI).

- Consider adopting special standards for site plans in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands (Section VIII). Such standards might include maximum distance from collector road, maximum driveway length, on-site water supply, and landscaping specifications. (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.)

Actions and Policies

- Consider expanding the Conservation District. (See Section 5 of this document.)

Green Infrastructure

Green infrastructure encompasses the network of undeveloped lands and waters that support human life and economic activity as well as native wildlife populations. Green infrastructure also includes urban forests, from parks and cemeteries to backyard and street-side trees. Green infrastructure provides the essential services, including solar energy conversion, nutrient cycling, air and water purification, and climate moderation, that enable ecosystems to function and support life. At a local scale, the presence of green infrastructure enhances human quality of life, contributes to property values, and provides wildlife habitat.

Current Provisions

The Master Plan recognizes the importance of open space and forestry and agricultural land uses to the community; cites the community's desire to retain its rural character, encourage conservation, and protect natural resources and ecologically sensitive areas; and recommends continued efforts to protect land through current use taxation, fee and easement acquisition, and zoning provisions such as overlay zones. The Hazard Mitigation Plan includes open space preservation, watershed management, forest and vegetation management, and wetland restoration and preservation among recommended mitigation projects. The Natural Resources Inventory addresses multiple components of Green Infrastructure. The Zoning Ordinance includes providing for agricultural and forestry uses in the purposes of the Rural District; preserving and protecting woodlands, wetlands, and large tracts of undeveloped agricultural and forest lands in the purpose of the Conservation District; and conserving agricultural and forest lands and habitat in the purpose of Open Space Subdivision design. The purpose of the Earth Excavation Regulations includes preservation of forests and wildlife. Subdivision Regulations include preservation of wildlife habitat and open space in considerations of short- and long-term impacts of proposals.

Recommendations

Master Plan:

- Consider adopting a recommendation to revise policies and regulations to minimize destruction of natural vegetation during construction activities.

Zoning Ordinance:

- Consider including protection of important natural resources, including agricultural lands, forests, highly ranked wildlife habitat, and wildlife connectivity zones in the purposes of the Zoning Ordinance (Article I).

- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).

- Consider establishing a Forest Conservation District, with a larger (e.g., 20- to 50- acre) minimum lot size, in areas of large unfragmented blocks (Article II). (The Lyme, NH zoning

ordinance includes a Mountain and Forest Conservation District, which could provide a useful model [www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc]) .

- Consider adopting overlay districts to protect components of green infrastructure as discussed elsewhere in this document (Article II).

- Consider permitting Open Space subdivisions by right, but conventional subdivisions by Special Exception in the Conservation and Rural districts (Article IV, Table 1).

- Consider adopting a *maximum* front setback for the Conservation and Rural districts to minimize fragmentation effects (Article IV B, Table 2).

Subdivision Regulations

- Consider requiring Preliminary Conceptual Consultation for subdivisions in the Rural and Conservation districts.
  OR
  Consider requiring Pre-Submission Discussion for site plans involving forest lands of 12 acres or more (Section IV).

Site Plan Review Regulations

- Consider requiring Pre-Submission Discussion for site plans in the Rural and Conservation districts.
  OR
  Consider requiring Pre-Submission Discussion for site plans involving forest lands of 12 acres or more (Section IV).

Actions and Policies

- Consider developing a Green Infrastructure or Open Space plan for the Town.

- Consider expanding the Conservation District. (See Section 5 of this document.)

Groundwater

Groundwater includes water stored in stratified drift (i.e., sand and gravel) aquifers and in bedrock (i.e., deep or artesian) aquifers, and is the most common source of drinking water in New Hampshire. Potable groundwater is a critical resource for New Hampshire communities. High-yield aquifers are included in the NH Natural Services Network as Water Supply Lands. Groundwater is important to wildlife as the source of springs and seeps which provide water in upland areas and feed surface waters and wetlands.

Current Provisions

Master Plan Vision Statement recognizes the need for wise stewardship of the Town's water resources. Natural Resources Inventory includes section on Aquifers and Aquifer Recharge and includes aquifers in Local Resource Protection Priorities, and recommends adopting an Aquifer Protection Overlay Zone, requiring on-site retention of stormwater, and Town ownership of lands overlying and adjacent to productive aquifers. Hazard Mitigation Plan recommends restricting potential contamination sources from locating in a wellhead protection area and recommends adoption of an Aquifer Protection Ordinance. Zoning Ordinance includes conservation of land overlying aquifers in purpose of Open Space Subdivisions; Planning Board may require Open Space Subdivision if property equals or exceeds 20 acres and includes a portion of an aquifer exceeding 1,000 sq. ft. per day transmissivity.

Recommendations

Master Plan:

- Consider adopting recommendations such as:
    - Develop/maintain/implement a wellhead protection plan.
    - Adopt an aquifer protection ordinance to ensure adequate recharge and prevent contamination of important aquifers.
    - Review and revise the Town's aquifer protection regulations based on the State's most recent stratified drift aquifer maps.
    - Develop a groundwater quality map for the Town.
    - Work with adjacent towns to protect shared aquifers.

Zoning Ordinance:

- Consider including protection of important natural resources, including groundwater in the purposes of the Zoning Ordinance (Article I).

- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).

- Consider adopting an aquifer overlay district (Article II). (See Chapter 2.5, "Protection of Groundwater and Surface Water Resources," in *Innovative Land Use Planning Techniques.*)

Subdivision Regulations:

- Consider including provision for protecting natural resources, including groundwater in Purpose (Section I B) of Subdivision Regulations.

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving lands overlying aquifers (Section II).

- Consider including mapped aquifers on location map required in Submission and Information Requirements for Design Review (Section III C d).

- Consider adding a provision in General Guidelines (Section VI A) that the applicant shall avoid or minimize impervious surfaces and potential pollution sources on lands overlaying aquifers.

- Consider including discussion of aquifer recharge and preventing groundwater pollution in the Erosion and Sediment Control Regulations (Section VI H).

Site Plan Review Regulations:

- Consider including contamination of aquifers and reduction of aquifer recharge area protection against adverse environmental impacts from a proposed development in the Purpose (Section II).

- Consider revising to read "…. To protect against adverse environmental impacts from a proposed development including inadequate disposal or storage of sewage, refuse, and other wastes; **contamination of aquifers; loss of aquifer recharge area;** and/or inadequate surface drainage." (Section II).

- Consider requiring Pre-Submission Discussion for site plans involving lands overlying aquifers (Section IV).

- Consider including location of stratified drift aquifers in Application Requirements (Section VII B 3 j).

- Consider including measures to prevent groundwater contamination and maintain aquifer recharge areas in Environmental Protection Requirements for Site Plan Approval (Section VIII D) for lands overlaying mapped aquifers.

Actions and Policies

- Consider following the recommendation in the Natural Resources Inventory to prohibit or restrict new potential contamination sources in well-head protection areas.

Growth Management and Sprawl

Growth management includes a variety of techniques and strategies intended to encourage orderly growth and development in areas appropriate for development, protect important natural resources, and discourage sprawl. Growth management helps to prevent deterioration of human quality of life and property values and loss and degradation of wildlife habitat that result from uncontrolled growth. Sprawl refers to dispersed, automobile-dependent development that segregates residential, commercial, industrial, and business uses. Sprawl contributes to air pollution and inefficient use of time and resources, which have negative impacts on human health, economic well-being, and quality of life. The inefficient use of land associated with sprawl results in excessive loss and degradation of wildlife habitat.

Current Provisions

Master Plan recommends concentrating future growth in areas where public services can be provided efficiently; includes a Growth Management section; and recommends adoption of a growth management ordinance. Zoning Ordinance includes provisions for Open Space Subdivisions.

Recommendations

Master Plan: None

Zoning Ordinance:

- Consider adopting overlay districts to protect specific natural resources OR a comprehensive Natural Resource Overlay District including agricultural lands and productive soils, wetlands, shoreland buffers, steep slopes, ridgelines, and highly ranked wildlife habitat identified in the NH Wildlife Action Plan (Article II) (see "Agricultural Incentive Zoning" [Chapter 1.7], "Shoreland Protection: The Importance of Riparian Buffers" [Chapter .6], "Steep Slope and Ridgeline Protection" [Chapter 2.2], "Wetlands Protection" [Chapter 2.4] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development;* Lakes Region Planning Commission. 2005. *Regulating Development on Steep Slopes, Hillsides, and Ridgelines*).

- Consider allowing Open Space Subdivisions by right and conventional subdivisions by Special Exception in Conservation and Rural districts Article IV, Table 1).

Subdivision and Site Plan Review Regulations: None

Actions and Policies

- Consider providing incentives for locating development within Village Districts.

- Consider expanding the Village Districts. (See Section 5 of this document.)

- Consider expanding the Conservation District. (See Section 5 of this document.)

Impervious Surfaces

Impervious surfaces include buildings, exposed rock, concrete, and other materials through which water cannot move. Impervious surfaces increase run-off of precipitation, potentially leading to erosion, sedimentation, flooding, and reduced groundwater supplies which are detrimental to both humans and wildlife. Impervious surfaces also contribute to heat island effects and reduce air quality.

Current Provisions

Master Plan recommends implementing flexible roadway design standards. Natural Resources Inventory includes discussion of impervious surfaces and their impacts. Zoning Ordinance includes minimizing runoff by reducing land area covered by impervious surfaces and providing greater efficiency in siting of services and infrastructure by reducing road length and width in objectives of Open Space Subdivisions. Subdivision Regulations provide for relaxing some road design requirements under specified conditions.

Recommendations

Master Plan:

- Consider adopting recommendations such as:
    - Encourage flexible road widths within subdivisions that minimize paving while ensuring adequate and safe access for emergency response vehicles.
    - Review and revise policies and regulations to minimize impervious surfaces.

Zoning Ordinance:

- Consider encouraging the use of permeable pavement in Off-Street Loading and Parking specifications (Article III H).

- Consider adopting maximum impervious lot coverage standard for each zoning district Article IV, Table 2).

- Consider adopting an ordinance to address impervious surfaces. "Permanent (Post-construction) Stormwater Management" (Chapter 2.1) in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses impervious surfaces.

Subdivision Regulations:

- Consider including minimization of impervious surface in considerations for short and long-term impacts of a proposal (Section III A).

- Consider encouraging flexible road widths within subdivisions that minimize paving while ensuring adequate and safe access for emergency response vehicles (Section VI B).

Site Plan Review Regulations:

- Consider including provision that access, parking, and loading areas shall be designed and constructed so as to minimize impervious surfaces in Requirements for Site Plan Approval (Section VIII A).

- Consider including total impervious surface and percent of project area in Application Requirements (Section VII B 3).

- Consider allowing permeable pavement for driveways, parking lots, and sidewalks with Board approval (Section VIII A).

Landscaping and Natural Vegetation

Landscaping refers to refers to visible, human-modified features of a plot of land, including vegetation, water features, shape of terrain, fences and other material objects. Landscaping contributes to the aesthetics of neighborhoods and communities, enhances property values, improves urban air quality, and can reduce heating and cooling costs. Natural vegetation includes the native trees, shrubs, wildflowers, grasses, ferns, and mosses that grow on a land parcel before it is cleared for development. Maintaining as much natural vegetation on a development site as practical prevents erosion, mediates microclimate, contributes to human quality of life and property values, and saves the time, cost, and risks of installing new plantings. Landscaping benefits wildlife by providing backyard habitat. Natural vegetation provides higher wildlife habitat value than new plantings.

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important ecological resources. The Hazard Mitigation Plan includes vegetation management among recommended mitigation projects. The Zoning Ordinance includes landscaping provisions in performance standards for Personal Wireless Communications Facilities, guidelines for use of Treated Soils, and site design standards for Manufactured Housing parks and subdivision; Objectives of Open Space Subdivisions include encouraging the maintenance and enhancement of habitat for plant and animal communities and minimizing site disturbance and erosion through retention of existing vegetation. Subdivision Regulations include explanation of landscaping requirements and plans in Design Review Submission and Information Requirements. Site Plan Review Regulations include specifications for landscaping plans.

Recommendations

Master Plan:

- Consider adopting recommendations such as:
    - Review and revise policies and regulations to minimize destruction of natural vegetation during construction activities.
    - Review and revise policies and regulations to encourage the use of native species in landscaping.
    - Review and revise policies and regulations to discourage the use of plants that require significant inputs of water and nutrients in landscaping.
    - Encourage landscaping designs that reduce heating and cooling costs.

Zoning Ordinance:

- Consider adopting a landscaping ordinance for the Business, Light Business, and Village zoning districts ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance pertaining to landscaping. This model ordinance includes a Special Provision that calls for minimizing site disturbance and retaining existing vegetation whenever possible. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast.)

Subdivision Regulations:

- Consider adopting landscaping regulations for subdivisions involving new streets (Section VI). ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision regulations pertaining to landscaping. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast.)

Site Plan Review Regulations:

- Consider strengthening provisions to encourage the retention of natural vegetation, use of native species, and use of landscaping to reduce heating and cooling costs; and discourage use of species that require significant inputs of water and nutrients (Section VIII C). ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision regulations pertaining to landscaping. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast.)

Light Pollution

Light pollution includes any adverse effects of artificial light, including sky glow, glare, light trespass, decreased night visibility and energy waste. Controlling light pollution conserves energy and resources, saves money, and prevents public health and safety hazards and nuisances. Controlling light pollution can avoid negative impacts of artificial light on wildlife, particularly on migratory birds.

Current Provisions

Natural Resources Inventory cites currently low levels of light pollution. Zoning Ordinance requires shielding of illuminated signs and prohibits lighting of wireless communications towers unless required by the FAA. Site Plan Review regulations prohibit glare on abutting properties, public highways, and streets; Application Requirements include an exterior lighting plan.

Recommendations

Master Plan:

- Consider adopting a recommendation pertaining to dark sky preservation.

Zoning Ordinance: None

Subdivision Regulations:

- Consider including lighting plan for proposed streets in Submission and Information Requirements (Section III C). (The New England Light Pollution Advisory Group [NELPAG] provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ [www.cfa.harvard.edu/nelpag/ordbylaw.html] and the International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. [www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php])

Site Plan Review Regulations

- Consider adopting design standards for outdoor lighting (Section VIII D). (The New England Light Pollution Advisory Group [NELPAG] provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ [www.cfa.harvard.edu/nelpag/ordbylaw.html] and the International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. [www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php])

Natural Hazards

Natural hazards are dangers to people and property associated with natural phenomena such as geological and ecological processes and weather. New Hampshire's most common natural hazard is flooding. Forest fires are infrequent in the State, and are usually controlled before spreading very far. Landslides are most likely in mountainous areas, but can occur locally anywhere slopes exist.

Land use practices can mitigate or exacerbate the risks of natural hazards. Development that reduces infiltration and storage of precipitation can exacerbate downstream flooding. Scattered residential development in extensive forests both increases the risk of forest fires and makes fighting them more difficult and dangerous. On steep slopes, increased water in soils from precipitation or leach fields, soil vibration from construction or traffic, undercutting at the foot of slope, and increased weight from new buildings) above all can trigger slope failure.

Climate change may alter the frequency of these hazards if precipitation events become more sporadic and intense. Natural hazards can threaten human health and safety, damage public and private property, and degrade or destroy wildlife habitat.

Current Provisions

The Hazard Mitigation Plan addresses flooding, drought, wildfire, and landslides; cites 11 streams and 10 ponds that can contribute to flooding in the Town, indicates that floodplain maps are outdated and inaccurate but that flooding in Gilmanton is neither frequent nor severe; ranks drought as possible; notes that the heavily forested outer edge of the Town is vulnerable to wildfire, particularly during drought periods; landslides are considered unlikely; includes natural resource protection actions among mitigation projects. The Zoning Ordinance includes the New Hampshire Model Floodplain Management Ordinance.

Recommendations

Master Plan (Hazard Mitigation Plan):

- Consider including a map of natural hazards in the Hazard Mitigation Plan, identifying areas prone to flooding as well as formally recognized floodplains, areas vulnerable to wildfire, and areas of steep slopes.

- Consider acknowledging that the frequency and intensity of major precipitation events appear to be increasing.

Zoning Ordinance:

- Consider adopting overlay districts to address site-specific hazards (i.e., Floodplains, Steep Slopes, Wild Fire hazard areas) (Section II).

Subdivision Regulations:

- Consider requiring Preliminary Conceptual Consultation for subdivisions in identified natural hazard areas (Section II).

- Consider including soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation in Submission and Information Requirements for Preliminary Conceptual Consultation Phase (Section III C 1 d).

- Consider adopting special standards for subdivisions in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands (Section VI). Such standards might include maximum distance from collector road, maximum driveway length, on-site water supply, and landscaping specifications. (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.)

Site Plan Review Regulations:

- Consider requiring Pre-Submission Discussion for site plans in identified natural hazard areas (Section IV).

- Consider adopting special standards for site plans in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands (Section VIII). Such standards might include maximum distance from collector road, maximum driveway length, on-site water supply, and landscaping specifications. (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.)

Shorelands, Surface Waters, and Wetlands

Shorelands, surface waters, and wetlands comprise the visible parts of the land's hydrological network. These resources govern the quality and availability of water for human and livestock consumption, recreational activities, industrial uses, and wildlife habitat. Shorelands, also called riparian areas, are frequently used as travel corridors for wildlife moving across the landscape.

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important water resources; recommendations include adoption of overlay zones for wetlands and ground and surface water resources. The Hazard Mitigation Plan includes stormwater management, sediment and erosion control, stream corridor restoration, watershed management, and wetland restoration and preservation among recommended mitigation projects. The Natural Resources Inventory includes chapters on Water Resources and Wetlands; recommends protecting riparian corridors and undeveloped lake and pond frontage; recommends adopting a wetlands ordinance; and recommends amending the Subdivision and Site Plan Review regulations to require wetlands mapping by a certified wetland scientist for all applications. The Zoning Ordinance includes protection of the lake and the water supply in the purpose of the Residential Lake District; includes conservation of water quality in the purpose of Open Space Subdivisions; includes conservation of land that protects water quality and quantity including watersheds and buffers along streams and rivers, wetlands and floodplains, and ponds and lakes in the objectives of Open Space Subdivisions; and includes protection of water quality in the purpose of the Shore Front Development article. Subdivision Regulations preclude use of wetland soils to fulfill minimum lot size requirements; prohibit platting of areas with high water table (within 2' of the surface); require protection of brooks, streams, and water bodies; require certified approval by NH Wetlands Board for any dredge and fill activity; require boundaries of natural features, including streams, lakes, ponds, and marshes in completed application; require natural vegetation buffer at least 20' in width from edge of perennial streams, very poorly drained wetland soils, rivers, and water bodies exceeding 10 acres. The Earth Excavation Regulations include preservation of natural water assets and prevention of water pollution in purposes; require that applications include surface water bodies and streams adjacent to proposed excavation sites; prohibit excavations within 100 feet of streams, wetlands, and water bodies.

Recommendations

Master Plan: None

Zoning Ordinance:

- Consider including protection of important natural resources, including surface waters and wetlands in the purposes of the Zoning Ordinance (Article I).
- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).
- Consider permitting Open Space subdivisions by right, but conventional subdivisions by Special Exception in the Conservation and Rural districts (Article IV, Table 1).

- Consider adopting a Wetlands Ordinance, as recommended in the Natural Resources Inventory, OR including wetlands and shoreland buffers in a comprehensive natural resource overlay district to increase protection of wetlands and undeveloped shorelands. ("Shoreland Protection: The Importance of Riparian Buffers" [Chapter 2.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance that addresses shorelands of surface waters, and information about existing shoreland protection ordinances in New Hampshire. "Wetlands Protection" [Chapter 2.4] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance that addresses wetlands, and information about existing wetlands protection ordinances in New Hampshire.)

Subdivision Regulations:

- Consider including provision for protecting natural resources, including shorelands, surface waters, and wetlands in Purpose (Section I B) of Subdivision Regulations.

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving wetlands or shorelands (Section II).

- Consider requiring that boundaries of wetland and shoreland buffers be permanently marked to facilitate awareness of future landowners. This can be accomplished by adding a special condition to appropriate subdivision approvals to the effect of "The wetland buffers shall be clearly and permanently marked before, during, and after construction; building permits will not be issued until the buffers are marked" or by adding such language into the Subdivision Regulations (Section VI).

- Consider including wetland soils in Submission and Information Requirements (Section III C 1).

Site Plan Review Regulations:

- Consider adding provision for the protection of important natural resources, including shorelands, surface waters, and wetlands, in Purpose (Section II).

- Consider requiring Pre-Submission Discussion for site plans involving wetlands or shorelands (Section IV).

- Consider changing "marshes" to "wetland soils" in Application Requirements (Section VII B 3).

- Consider requiring that boundaries of wetland and shoreland buffers be permanently marked to facilitate awareness of future landowners. This can be accomplished by adding a special condition to appropriate site plan approvals to the effect of "The wetland buffers shall be clearly and permanently marked before, during, and after construction; building permits will not be issued until the buffers are marked" or by adding such language into the Site Plan Review Regulations (Section VIII D).

- Consider including wetland soils in Definitions (Section V).

Steep Slopes and Ridgelines

Steep slopes are often defined as grades equal to or exceeding 15%, i.e., areas where the elevation increases 15 feet in 100 feet of horizontal distance. Slopes with such high gradients are vulnerable to failure, when the pull of gravity on slope materials exceeds the forces of friction and cohesion that hold them in place. Protecting steep slopes prevents damage to public and private property resulting from slope failure; environmental damage such as erosion, sedimentation, and drainage problems; excessive cuts and fills; and unsightly slope scars. Ridgelines form the boundary between watersheds, and land uses in these sensitive areas can have negative impacts for great distances downstream. Ridgeline development is also visible over large areas and affects community aesthetics and rural character. Many ridgelines have shallow soils that support mast-bearing trees, such as oaks, hickories, and beech, which provide important food sources for wildlife. Ridgeline protection benefits wildlife by protecting these food sources and important travel routes for large mammals. Protection of steep slopes benefits wildlife by preventing habitat degradation of uplands, wetlands, and surface waters.

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important water and ecological resources; Master Plan recommends adoption of overlay zones to protect steep slopes. The Hazard Mitigation Plan includes sediment and erosion control among recommended mitigation projects. The Natural Resources Inventory includes constraints map showing slopes exceeding 25%, and recommends considering limitation on development above certain elevations. The Zoning Ordinance indicates that wireless telecommunication facilities are fundamentally incompatible with slopes of or exceeding 25%, and excludes areas of steep slope from calculations of common areas for cluster residential development and manufactured housing parks. Subdivision Regulations state that slopes of or exceeding 15% present problems sufficient to endanger health, life, or property, and lands of excessive slope shall not be platted; areas where average slope exceeds 25% are excluded from fulfillment of lot size requirements; street grades shall generally conform to existing terrain, and shall not exceed eight percent; driveway grades shall not exceed 10 percent.

Recommendations

Master Plan (Hazard Mitigation Plan):

- Consider including a map of natural hazards in the Hazard Mitigation Plan, identifying areas of steep slopes.

Zoning Ordinance:

- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).
- Consider adopting a Steep Slopes and Ridgelines Ordinance OR including ridgelines and steep slopes in a comprehensive natural resources overlay district (Article II). (See Lakes Region

Planning Commission. 2005. *Regulating Development on Steep Slopes, Hillsides, and Ridgelines* and "Steep Slope and Ridgeline Protection" [Chapter 2.2] in *Innovative Land Use Planning Techniques*.)

- Consider adopting overlay districts to address site-specific hazards (i.e., Steep Slopes, Wild Fire hazard areas) (Article II).

- Consider excluding areas of steep slopes from fulfilling lot size requirements (Article IV).

Subdivision Regulations:

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving steep slopes or ridgelines (Section II).

Site Plan Review Regulations:

- Consider requiring Pre-Submission Discussion for site plans involving steep slopes or ridgelines (Section IV).

- Consider including areas of steep slopes in Site Plan Application Requirements (Section VII B 3).

- Consider restricting grades of sidewalks, parking lots, and driveways (Section VIII A 6).

Stormwater Management and Erosion Control

Stormwater runoff refers to precipitation that cannot soak into the ground and subsequently ponds or flows over the earth's surface. Management of this runoff is important for preventing soil erosion, water pollution, and flooding, and for ensuring adequate recharge of groundwater. Erosion control prevents damage to private property and public investments such as roadways, conserves the productivity of upland soils, and prevents degradation of wetlands and surface waters. Stormwater management and erosion control benefit wildlife by preventing degradation of upland and aquatic habitats.

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important water and ecological resources. The Hazard Mitigation Plan includes stormwater management regulations and sediment and erosion control among recommended mitigation projects. The Zoning Ordinance requires regrading within 90 days when soil is removed within 100 feet of a travel way to prevent erosion. Subdivision Regulations include Drainage standards and Erosion and Sediment Control regulations. Site Plan Review Regulations require adequate provisions for surface drainage and erosion control. Earth Excavation Regulations include Drainage standards and Erosion and Sediment Control Regulations.

Recommendations

Master Plan

- Consider adopting a recommendation to review and revise local policies and regulations to ensure that future development will minimize stormwater runoff and erosion potential.

- Consider including a map of natural hazards in the Hazard Mitigation Plan, identifying areas prone to flooding as well as formally recognized floodplains, and areas of steep slopes.

Zoning Ordinance:

- Consider adopting overlay districts to address site-specific hazards (i.e., Steep Slopes, Wild Fire hazard areas) (Article II).
- Consider encouraging the use of permeable pavement in Off-Street Loading and Parking specifications (Article III H).

- Consider revising section on Removal of Natural Material (Article III I) to include revegetation as well as regrading, and to include areas within 100 feet of a property line in order to protect abutters from erosion and washouts, and areas within 100 feet of a wetland or waterbody.

- Consider adopting maximum impervious lot coverage standard for each zoning district (Article IV).

- Consider adopting a steep slopes ordinance. [See "Steep Slope and Ridgeline Protection" (Chapter 2.2) in *Innovative Land Use Planning Techniques*].

- Consider adopting a stormwater ordinance. "Permanent (Post-construction) Stormwater Management" (Chapter 2.1) in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses stormwater management and information about pertinent existing ordinances in New Hampshire.

Subdivision Regulations:

- Consider including statement such as "Avoidance of extensive excavation, grading, and filling to the extent practicable" in considerations of proposal impacts in Application for Design Review Phase Approval (III.A).

Site Plan Review Regulations:

- Consider requiring a plan for on-site stormwater management (Section VII B 3).
- Consider restricting grades of sidewalks, parking lots, and driveways (Section VIII A 6).
- Consider allowing permeable pavement for driveways, sidewalks, and parking areas with Board approval (Section VIII).

Actions and Policies

- Review "Erosion and Sediment Control During Construction" (Chapter 2.8) in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* and adopt new regulations and standards as appropriate.

Terrain Alteration

Terrain alteration refers to earth-moving operations, including cut and fill, which reshape the topography of the land. State law requires a permit from the Department of Environmental Services for activities that disturb more than 100,000 square feet of terrain (50,000 square feet within protected shorelands), but municipalities may adopt more stringent regulations. Terrain alteration can result in soil erosion and increased stormwater runoff, leading to water pollution and damage to public and private property damage. Terrain alteration results in direct and indirect loss of wildlife habitat.

Current Provisions

Zoning Ordinance requires regarding of excavation sites within 100 ft of a public roadway. Subdivision Regulations specify that street grades shall generally conform to existing terrain. Site Plan Review Regulations require indication of grade changes in application. Earth Excavation Regulations require permit, excavation plan, and reclamation plan for earth excavation for commercial purposes.

Recommendations

Master Plan:

- Consider including a recommendation such as "Adopt policies to minimize the extent of terrain alteration associated with development in order to maintain natural hydrologic patterns, maintain rural character, and protect property and public safety."

Zoning Ordinance: None

Subdivision Regulations:

- Consider including statement such as "Avoidance of extensive excavation, grading, and filling to the extent practicable" in considerations of proposal impacts in Application for Design Review Phase Approval (Section III A).

- Consider including cut and fill volumes in Submission and Information Requirements (Section III C 2).

Site Plan Review Regulations:

- Consider including cut and fill volumes in Application Requirements (Section VII 3).

- Consider including statement such as "Extensive excavation, grading, and filling shall be avoided to the extent practicable" in Environmental Protection Requirements for Site Plan Approval (Section VIII D).

Village District

A village district is a defined zoning area that accommodates mixed development, including the residential, commercial, and office uses that evolved in traditional New England villages. Village districts can be designed to encompass or expand existing village centers or to enable the development of new villages at desired locations, such as at crossroads or other nodes of activity. This planning tool provides economic benefits by concentrating services and infrastructure needs and helps to prevent sprawl. Village districts benefit wildlife by concentrating development on the landscape, resulting in larger contiguous areas of undeveloped land.

Current Provisions

Master Plan recommends expanding the village zones and increasing densities in areas of existing development. Zoning Ordinance includes two village districts.

Recommendations

Master Plan: None

Zoning Ordinance: None

Subdivision and Site Plan Review Regulations: None

Actions and Policies

- Consider adopting incentives for developing in Village Districts.
- Consider expanding Village Districts to accommodate future development. (See Section 5 of this document.)

Watersheds

A watershed is the area of land that drains into a particular water body. The cumulative effects of land uses within a watershed can lead to problems with water quality and flooding, and their associated negative impacts on humans and wildlife. Stream health deteriorates when impervious surfaces cover more than 10% of the watershed area; streams may become incapable of supporting beneficial uses when impervious coverage exceeds 25%.[1]

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important ecological resources. The Natural Resources Inventory discusses the Town's watersheds, and recommends adoption of a wetlands ordinance. The Hazard Mitigation Plan includes stormwater management regulations, sediment and erosion control, stream corridor restoration, wetland restoration and preservation, and watershed management as recommended mitigation projects.

Recommendations

Master Plan:

- Consider adding a recommendation to adopt land use policies that manage cumulative impacts of land use within a watershed.

- Consider adding a recommendation to collaborate in regional efforts to protect the Winnipesaukee and Suncook watersheds.

Zoning Ordinance:

- Consider including protection of important natural resources, including forests surface waters and wetlands in the purposes of the Zoning Ordinance (Article I).

- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).

- Consider establishing a Forest Conservation District, with a larger (e.g., 20- to 50- acre) minimum lot size, in areas of large unfragmented blocks (Article II). (The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a useful model [www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc]).

- Consider permitting Open Space subdivisions by right in the Conservation and Rural districts, with conventional subdivisions allowed by Special Exception (Article IV, Table 1).

- Consider adopting maximum impervious lot coverage standard for each zoning district (Article IV B, Table 2).

- See also Floodplains; Impervious Surfaces; and Stormwater Management and Erosion Control.

Subdivision and Site Plan Review Regulations:

- See Floodplains; Impervious Surfaces; Shorelands, Surface Waters, and Wetlands; and Stormwater Management and Erosion Control.

Actions and Policies

- Consider expanding the Conservation District. (See Section 5 of this document.)

[1] Schueler, T. 2000. Basic Concepts of Watershed Planning. Pp. 145-161 in T. Schueler and H. Holland, eds., *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City, MD.

Wildlife Habitat

Wildlife habitat includes the resources that native species need to survive: food, water, and shelter, including safe places to produce young, and safe travel routes between areas of critical resources. High quality wildlife habitat identified in the NH Fish & Game Department's Wildlife Action Plan is included in the NH Natural Services Network. The NH Wildlife Connectivity Model identifies potential travel corridors between large areas of protected land. Wildlife habitat contributes to human amenities such as clean water, clean air, recreation opportunities, aesthetic values, and rural character.

The New Hampshire Natural Services Network identifies 5,618 acres of highly ranked wildlife habitat in Gilmanton (approximately 7% of Town area), and the Natural Resource Inventory indicates that approximately 5% of the Town's land area is in agricultural use at the present time.

Current Provisions

The Master Plan Vision encourages wise stewardship of the Town's important wildlife habitat and ecological resources. The Natural Resources Inventory recommends implementing a Wetlands Ordinance to protect the Town's lakes, ponds, rivers, streams, and watersheds; protecting riparian corridors to maintain water quality and wildlife habitat; protecting remaining undeveloped lake and pond frontage; protecting vernal pools and adjacent uplands; protecting significant habitats; maintaining unfragmented parcels; and protecting riparian corridors. The Zoning Ordinance includes preserving and protecting woodlands, wetlands, and large tracts of undeveloped agricultural and forest lands in the purpose of the Conservation District; and conserving agricultural and forest lands and habitat in the purpose of Open Space Subdivision design. The purpose of the Earth Excavation Regulations includes preservation of forests and wildlife. Subdivision Regulations include preservation of wildlife habitat and open space in considerations of short- and long-term impacts of proposals.

Recommendations

Master Plan (Natural Resources Inventory):

- Consider identifying local priorities for open space protection that include core areas of important to high ranking wildlife habitat as identified in the N.H. Wildlife Action Plan.

- Consider adopting strategies to maintain wildlife connectivity zones within the Town.

Zoning Ordinance:

- Consider including protection of important natural resources, including highly ranked wildlife habitat, and wildlife connectivity zones in the purposes of the Zoning Ordinance (Article I).

- Consider including protection of natural resources in purposes of the Conservation and Rural districts (Article II).

- Consider establishing a Forest Conservation District, with a larger (e.g., 20- to 50- acre) minimum lot size, in areas of large unfragmented blocks (Article II). (The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a useful model [www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc])

- Consider adopting a natural resources overlay district including highly ranked wildlife habitat identified in the N.H Wildlife Action Plan (Article II). (See "Habitat Protection" [Chapter 2.3] in *Innovative Land Use Planning Techniques*.)

- Consider permitting Open Space subdivisions by right in the Conservation and Rural districts, with conventional subdivisions allowed by Special Exception (Article IV, Table 1).

- Consider adopting a *maximum* front setback and driveway length for the Conservation and Rural districts to minimize fragmentation effects (Article IV B, Table 2).

Subdivision Regulations:

- Consider including provision for protecting natural resources, including wildlife habitat in Purpose (Section I B.).

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving highly ranked wildlife habitat or identified wildlife connectivity zones (Section II).

- Consider including highly ranked wildlife habitat and identified wildlife connectivity zones in Submission and Information Requirements for Design Review (Section III B 2).

- Consider requesting identification and protection of special habitats such as vernal pools, deer wintering areas, and important mast stands in Subdivision and Information Requirements (Section III C 2).

- Consider adopting special standards for areas of highly ranked wildlife habitat identified in the NH Wildlife Action Plan to minimize habitat destruction and fragmentation. Such standards might include maximum lot coverage, maximum distance from collector road, connectivity of open space, and landscaping specifications (Section VI).

- Consider adopting special standards for identified wildlife connectivity zones (Section VI). Such standards could include maintenance of open space connectivity and stream crossing structures (e.g., culverts) that provide for wildlife passage.

Site Plan Review Regulations:

- Consider requiring Pre-Submission Discussion for site plans involving highly ranked wildlife habitat or identified wildlife connectivity zones.

- Consider adding provision for the protection of important natural resources, including important wildlife habitat and wildlife connectivity zones, in Purpose (II) of Site Plan Review Regulations.

- Consider requiring Pre-Submission Discussion for site plans involving forest lands of or exceeding 12 acres.

- Consider including highly ranked wildlife habitat and identified wildlife connectivity zones in Application Requirements (III.B.3.).

- Consider adopting special standards for areas of highly ranked wildlife habitat identified in the NH Wildlife Action Plan to minimize habitat destruction and fragmentation. Such standards might include maximum lot coverage, maximum distance from collector road, connectivity of open space, and landscaping specifications (Section VIII).

- Consider adopting special standards for identified wildlife connectivity zones. Such standards could include maintenance of open space connectivity and stream crossing structures (e.g., culverts) that provide for wildlife passage (Section VIII).

- Consider requesting identification and protection of special habitats such as vernal pools, deer wintering areas, and important mast stands in site plans. (See Voluntary Practices, Section 7.)

- Consider requiring sloped (Cape Cod) curbing where curbing is required (Section VIII A).

- Consider adopting design standards for outdoor lighting (Section VIII D). (The New England Light Pollution Advisory Group [NELPAG] provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ [www.cfa.harvard.edu/nelpag/ordbylaw.html] and the International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. [www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php])

Actions and Policies

- Consider expanding the Conservation District. (See Section 5 of this document.)

Spatial Analysis of Gilmanton's Important Natural Resources with respect to Current Zoning

Introduction

Maps provide useful tools for understanding the distribution of important natural resources on the landscape and how current zoning supports or hinders their protection. Several tools have been developed recently to help municipalities assess the spatial distribution of natural resources within their boundaries. The New Hampshire Natural Services Network (NSN) is a GIS-based tool created by a collaborative of planning and natural resource professionals. The NSN identifies lands throughout the State that provide important ecological services on which human life and economic opportunity depend, and which are difficult and expensive to replicate.

Natural Services Network base maps (Figure 1) include four components:

- **Water supply lands** include highly transmissive aquifers identified by the US Geological Survey and favorable gravel well sites identified by the NH Department of Environmental Services.

- **Flood storage lands** include 100-year floodplains identified by FEMA and lacustrine (associated with lakes), riverine (associated with rivers), and palustrine (other non-tidal) wetlands identified by the USFWS National Wetlands Inventory.

- **Productive soils** include prime farmland and farmland of statewide importance identified by the Natural Resource Conservation Service.

- **Highly ranked wildlife habitat** includes areas of highest ranked habitat by ecological condition in the State and within each of the State's nine ecoregions, as identified by the NH Fish & Game Department Wildlife Action Plan. A detailed explanation of the ranking process is provided at http://www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm.

The NH Wildlife Connectivity Model was developed in 2008 by NH Audubon and NH Fish & Game biologists. It is a basic GIS-based landscape permeability model that predicts potential broad-scale wildlife connectivity zones across the State. The model includes a set of raster data layers consisting of cost surfaces for 16 native wildlife species, chosen to represent a range of variation in their dispersal behavior. Each raster surface was created by assigning a "cost" value for each species on each 30 meter square of land. The cost value reflects the ease or difficulty of moving across the landscape for the species in question. Cost is based on land cover, distance to road (weighted for traffic volume), distance to riparian area, and slope. The 16 cost surfaces can be used individually or in combination to identify wildlife connectivity zones by determining least cost movement corridors between selected polygons. The mean cost surface (Figure 2), which averages cost values for the 16 species, is useful for general planning purposes. It is strongly encouraged that users incorporate best available local data sources wherever possible and ground-truth results of corridor analyses, which is essential for identifying critical connectivity zones.

Gilmanton currently has 6 zoning districts (Figure 3). The Rural District is the largest (29,139 acres) and includes most of the Town. The Conservation District (7,086 acres) is located in the northern part of town, along the entire boundary with Gilford and the northern sections of the Alton and Belmont boundaries. The Business District (784 acres) lies in the southwest corner along Route 106, abutting Belmont and

Canterbury. Two Light Business districts (293 acres in total) are located along Route 107 in and north of the village center. Two Village Districts (529 acres in total) are located at the village center and Gilmanton Iron Works. A Residential Lake District (236 acres) surrounds Sawyer Lake. In addition, Historic Overlay Districts are located between Parsonage and Garret hills (758 acres) and within the village center (106 acres).

Data Sources

Data layer	Source
Gilmanton_zone_2010	Lakes Regional Planning Commission
historic-poly	Lakes Regional Planning Commission
NH Natural Services Network	GRANIT
NH Wildlife Connectivity Model mean cost surface	NH Fish & Game Department

Methods

Using ArcView software, we overlaid Gilmanton's zoning districts on each component of the New Hampshire Natural Services Network and calculated resource areas within each zoning district. We used the mean cost surface from the Wildlife Connectivity Model to evaluate connectivity zones at the regional and local scales. For the regional assessment, we used the polygons associated with the Belknap Mountains/Hidden Valley (Alton/Gilford/Gilmanton), Blue Hills (Strafford), Franklin Falls Reservoir (Bristol/Franklin/Hill/New Hampton/Sanbornton), Moose Mountains (Brookfield, Middleton, New Durham), Osborne Wildlife Management Area (Loudon/Pittsfield/Barnstead/Gilmanton), and Shaker Village (Canterbury) as endpoints for the analysis. For the local assessment, we used polygons associated with the Osborne Wildlife Management Area; the Ayers Brook, Betty Smithers, Gilmanton, and Pine Hill town forests; Cogswell Mountain and Jones Farm conservation areas; the Hidden Valley and Johnson Woods conservation easements; Appendix A lists the various parcels associated with each of the endpoint polygons used in these analyses.

Results and Discussion

Water supply lands

Gilmanton encompasses 285 acres of water supply lands, all within the Town's Rural District (Table 1, Figure 4). Most of this area is closely associated with Crystal Lake; small patches are associated with Nighthawk Hollow Brook and the Suncook River. Approximately 2% of this acreage is currently protected by conservation ownership or easement. The Crystal Lake area also includes productive soils, flood storage area, and high ranking wildlife habitat. Conservation ownership, easement, aquifer overlay district, natural resource overlay district that includes aquifers, or extending the Conservation District to encompass this area would help to safeguard the future of this important resource.

Table 1. Distribution of Water Supply Lands across Gilmanton's Zoning Districts (acres)

Zoning District	Acres of water supply lands
Rural District	285
Conservation District	0
Business District	0
Light Business District	0
Village District	0
Lake Residential District	0

Flood storage areas

Gilmanton encompasses 3,004 acres of flood storage areas, distributed among the Town's six zoning districts (Table 2, Figure 5). Flood storage areas are widely scattered throughout the Town, and include many small wetlands as well as several Great Ponds. The majority of Gilmanton's flood storage areas fall within the Rural and Conservation districts. Approximately 10% of the total acreage is protected by conservation ownership or easement. A wetlands overlay district or natural resource overlay district that includes wetlands would help to protect these areas and prevent future flooding issues within the Town. Small portions of the Business and Village districts fall within flood storage areas. Adherence to the Floodplain Management Ordinance and detailed hazard mitigation planning can help to minimize future flood damage in these areas.

Table 2. Distribution of Flood Storage Areas across Gilmanton's Zoning Districts (acres)

Zoning District	Acres of Flood Storage Areas
Rural District	2,350
Conservation District	472
Business District	88
Light Business District	1
Village District	11
Lake Residential District	2

Productive soils

Gilmanton encompasses 2,709 acres of productive soils, distributed among the Town's six zoning districts (Table 3, Figure 6). Approximately 4% of this acreage is currently protected by conservation ownership or easement. Given the widespread distribution of productive soils within the Town, an agricultural overlay district or natural resource overlay district that includes productive soils would be the most efficient strategy for safeguarding the future of this important resource. Acquisition of agricultural easements could also be considered for some key areas.

Table 3. Distribution of Productive Soils across Gilmanton's Zoning Districts (acres)

Zoning District	Acres of Productive Soils
Rural District	2,411
Conservation District	122
Business District	0
Light Business District	65
Village District	111
Lake Residential District	0

Highly ranked wildlife habitat

Gilmanton encompasses 5,618 acres of highly ranked wildlife habitat, distributed among the Town's six zoning districts (Table 4, Figure 7). Much of this area is located in the northern part of Town, and is associated with the watersheds of Crystal, Manning, and Sunset lakes. Another concentration occurs along the Loudon boundary, associated with grasslands, wetlands, and hemlock-hardwood-pine forest. Approximately 18% of Gilmanton's highly ranked wildlife habitat is currently protected by conservation ownership or easement.

Table 4. Distribution of Highly Ranked Wildlife Habitat across Gilmanton's Zoning Districts (acres)

Zoning District	Acres of Important Wildlife Habitat
Rural District	4,084
Conservation District	1,401
Business District	119
Light Business District	0
Village District	14
Lake Residential District	0

Wildlife connectivity zones

Much of Gilmanton provides connectivity between areas of currently protected lands, and there is considerable overlap between regional and local connectivity zones within the Town (Figure 8, Table 5).

Table 5. Distribution of Local and Regional Wildlife Connectivity Zones across Gilmanton's Zoning Districts (acres)

Zoning District	Acres of Local Connectivity	Acres of Regional Connectivity
Rural District	12,733	14,247
Conservation District	1,445	3,144
Business District	0	722
Light Business District	0	99
Village District	8	0
Lake Residential District	50	84

Considerations

Figure 9 illustrates Gilmanton's water supply lands, flood storage areas, productive soils, and highly ranked wildlife habitat. The vicinity of Crystal Lake stands out as an area with multiple important natural resource values. Productive soils occur to the northeast and south of the lake, aquifers exist to the east and south, the lake and associated streams and wetlands provide flood storage, the watershed is highly ranked wildlife habitat, and the northern shore falls within a regional wildlife connectivity zone. The Town may want to consider focusing land protection activities in this area to best protect this concentration of resources. Extending the Conservation Zone to encompass this area, and including it within a natural resources overlay district are also potential strategies.

There are several zoning changes the Planning Board might want to consider that would help to focus future growth in existing village areas and to protect areas with important natural resources.

> *Village Districts* – Expanding the village districts to more "solid" shapes could encourage development near the village centers, rather than radiating further out along existing roads. For example, the Iron Works village district might be expanded to the southwest out to Shannon Road. The Four Corners village district might be extended further south along Allens Mill Road, perhaps to include the existing subdivision and connect easterly to the neighborhood north of Shellcamp Pond; connected across the two northern "legs" along routes 107 and 140; and connected across the

eastern "legs" along 140 and 107. Another possibility to consider is to incorporate the present Light Business District into a Mixed Use Village District that extended north from the Four Corners.

Conservation District – Areas to consider for expansion of the Conservation District include the area between the current district boundary and Route 140 west of Route 107, and the southern corner of the Town. The former extension would encompass three unfragmented blocks exceeding 1800 acres, numerous flood storage areas and productive soils, as well as the watershed and aquifer of Crystal Lake. The latter extension would encompass substantial areas of productive soils and highly ranked wildlife habitat and would complement existing protected lands in adjacent Loudon, Pittsfield, and Barnstead in the absence of fee and easement conservation acquisitions in Gilmanton.

A number of regulatory tools exist that could strengthen natural resource protection in Gilmanton. The functions of some tools overlap with those of others, so careful consideration will be needed to select the best combination of tools and resources to effectively meet the Town's needs.

- Agricultural Overlay District – provides protection for productive soils regardless of underlying zone. Useful in communities where agricultural lands are extensive and widely distributed, as is the case in Gilmanton.

- Aquifer Protection Overlay District - provides protection for groundwater supplies regardless of underlying zone. Useful in areas where fee or easement acquisition of aquifer recharge areas is not practical.

- Natural Resource Overlay District – could be designed to include areas of productive soils, aquifers, wetlands, large unfragmented forest blocks, highly ranked wildlife habitat, and wildlife connectivity zones in a single district, rather than addressing various resources with separate overlay districts.

- Open Space Subdivision by right in Conservation and Rural districts, with conventional subdivision allowed by special exception - serves multiple purposes as stated in objectives of ordinance

- Wetlands Protection Overlay District - Increasing wetland and stream buffers to at least 100' – provides for increased flood storage, improved protection of water quality, and maintenance of riparian habitat and wildlife connectivity.

Gilmanton has the benefit of quality natural resources and, at present, relatively low growth pressure. This enviable situation provides town officials with the opportunity to carefully weigh land use planning options and identify the most strategic choices for Gilmanton's future growth.

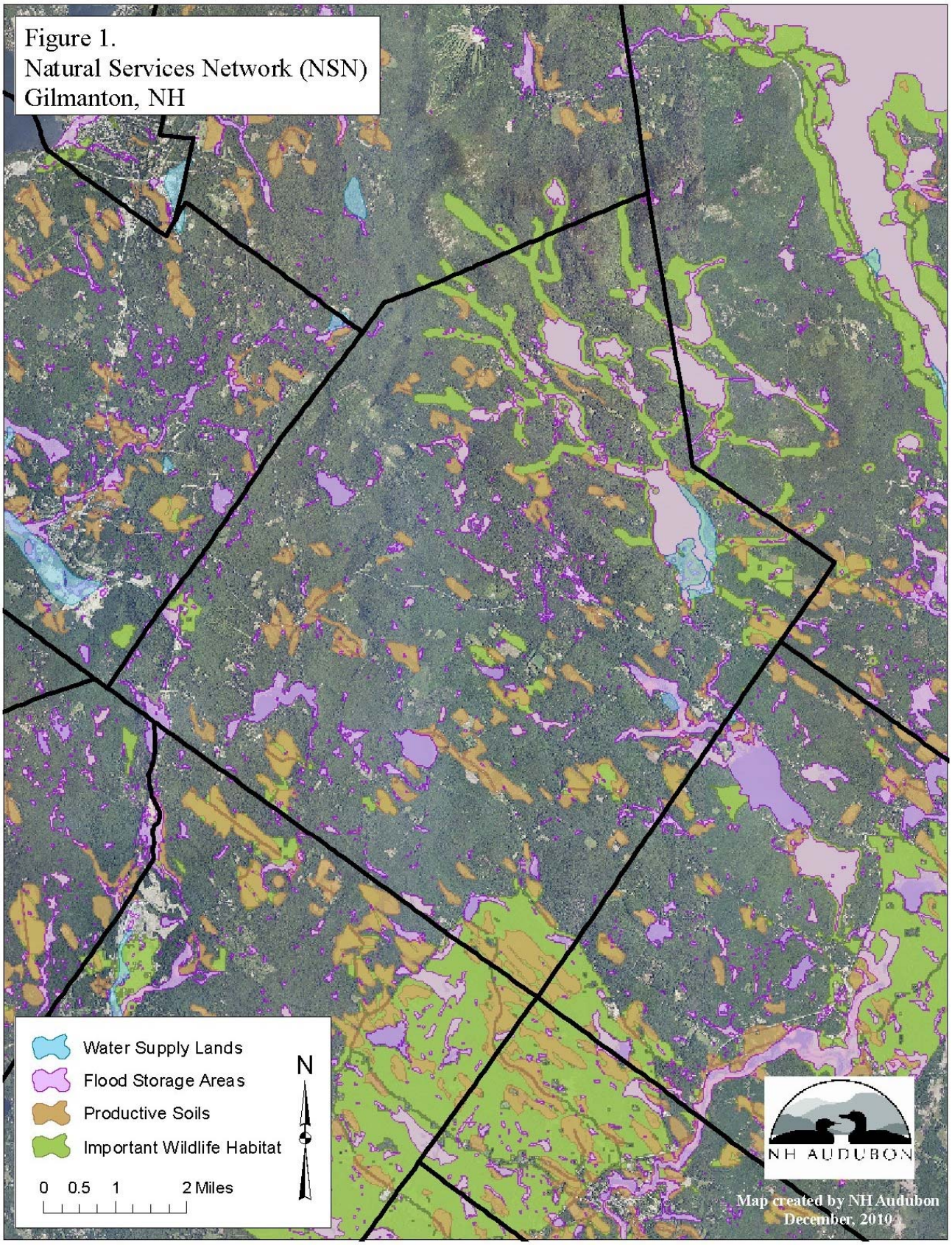
Figure 1.
Natural Services Network (NSN)
Gilmanton, NH
Water Supply Lands
Flood Storage Areas
Productive Soils
Important Wildlife Habitat
0 0.5 1 2 Miles
N
NH AUDUBON
Map created by NH Audubon
December, 2010

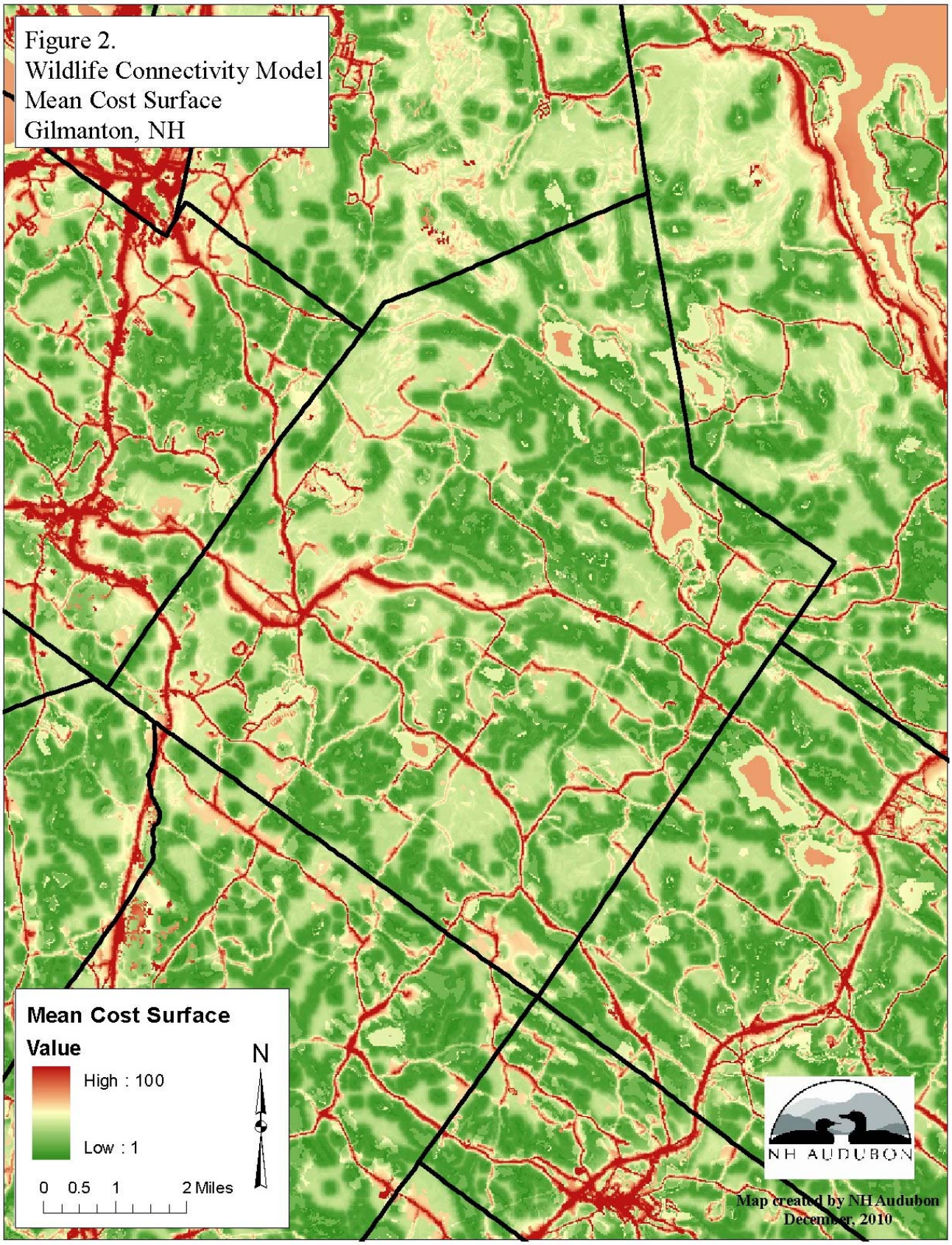
Figure 2.
Wildlife Connectivity Model
Mean Cost Surface
Gilmanton, NH
Mean Cost Surface
Value
High : 100
Low : 1
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

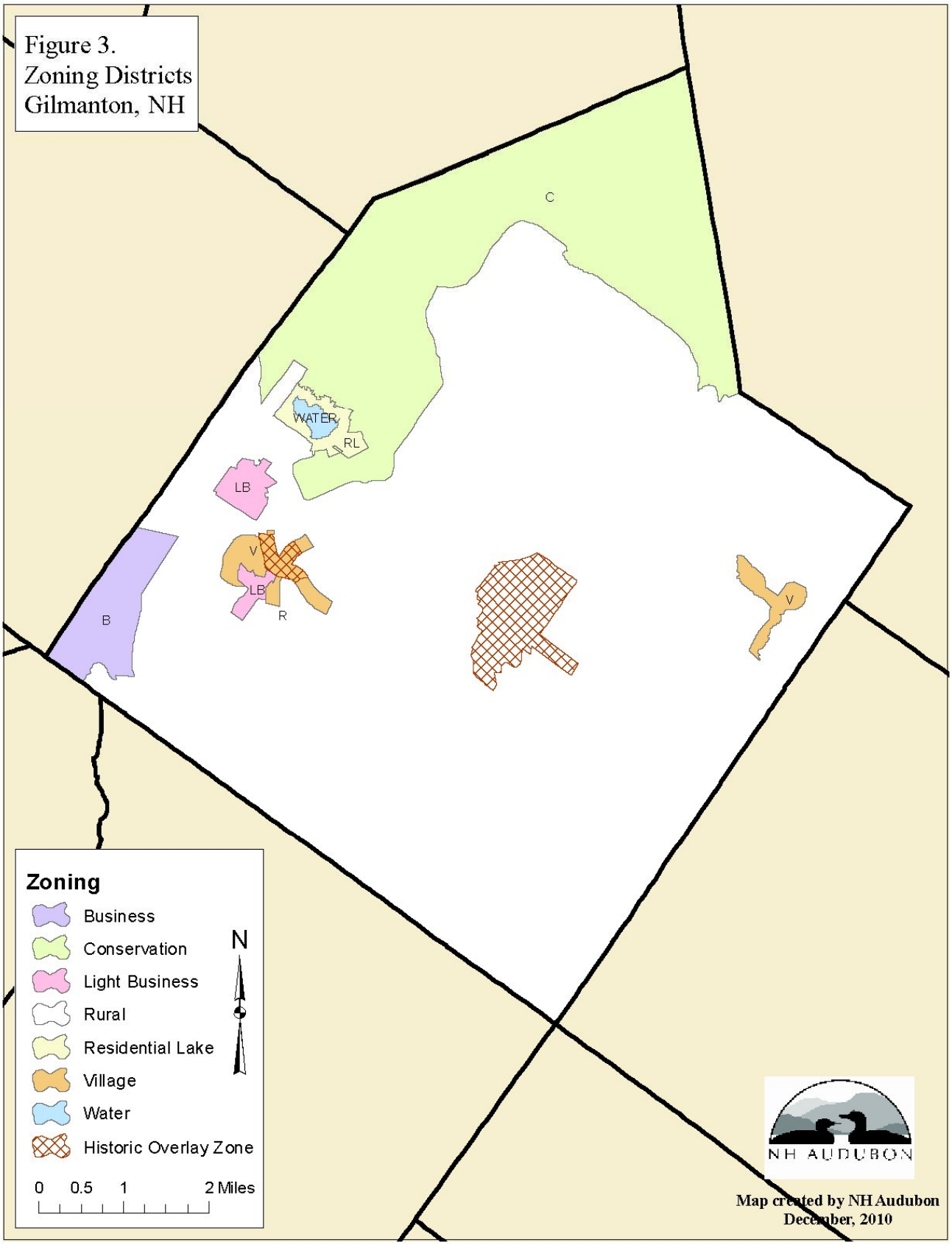
Figure 3.
Zoning Districts
Gilmanton, NH
C
WATER
RL
LB
V
LB
R
B
V
Zoning
Business
Conservation
Light Business
Rural
Residential Lake
Village
Water
Historic Overlay Zone
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

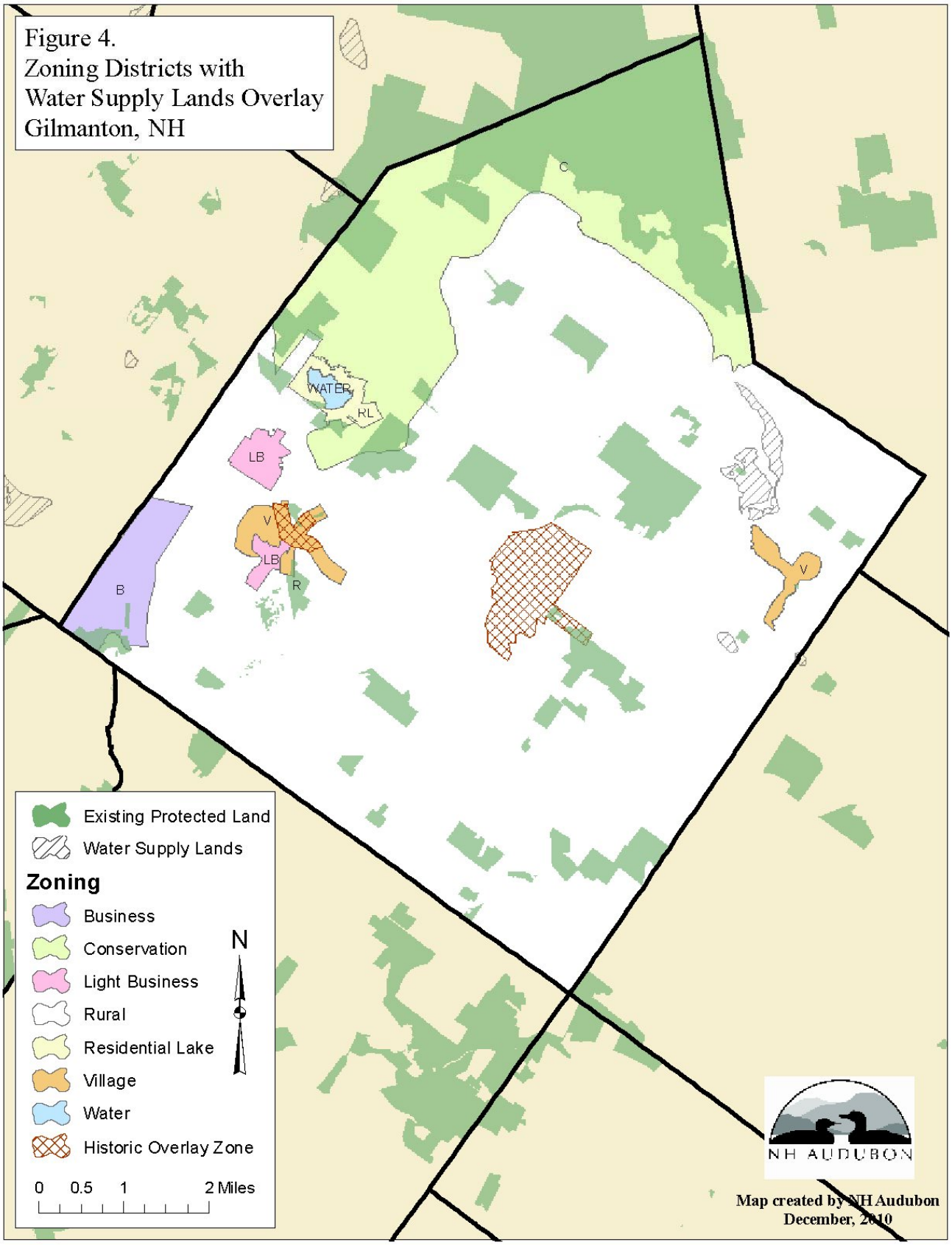
Figure 4.
Zoning Districts with
Water Supply Lands Overlay
Gilmanton, NH
C
WATER
RL
LB
V
LB
R
B
V
Existing Protected Land
Water Supply Lands
Zoning
Business
Conservation
Light Business
Rural
Residential Lake
Village
Water
Historic Overlay Zone
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

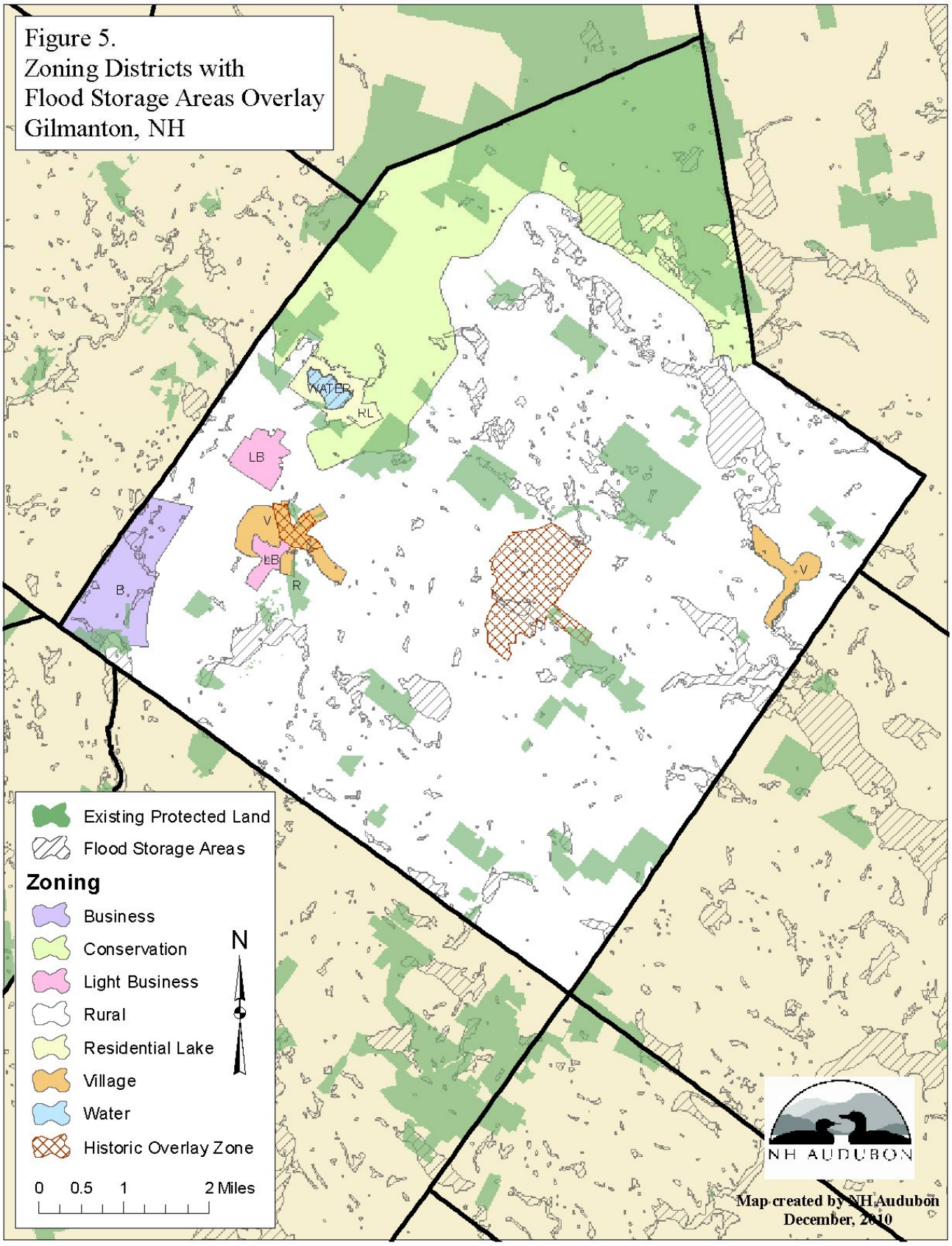
Figure 5.
Zoning Districts with
Flood Storage Areas Overlay
Gilmanton, NH
C
WATER
RL
LB
V
LB
R
B
V
Existing Protected Land
Flood Storage Areas
Zoning
Business
Conservation
Light Business
Rural
Residential Lake
Village
Water
Historic Overlay Zone
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

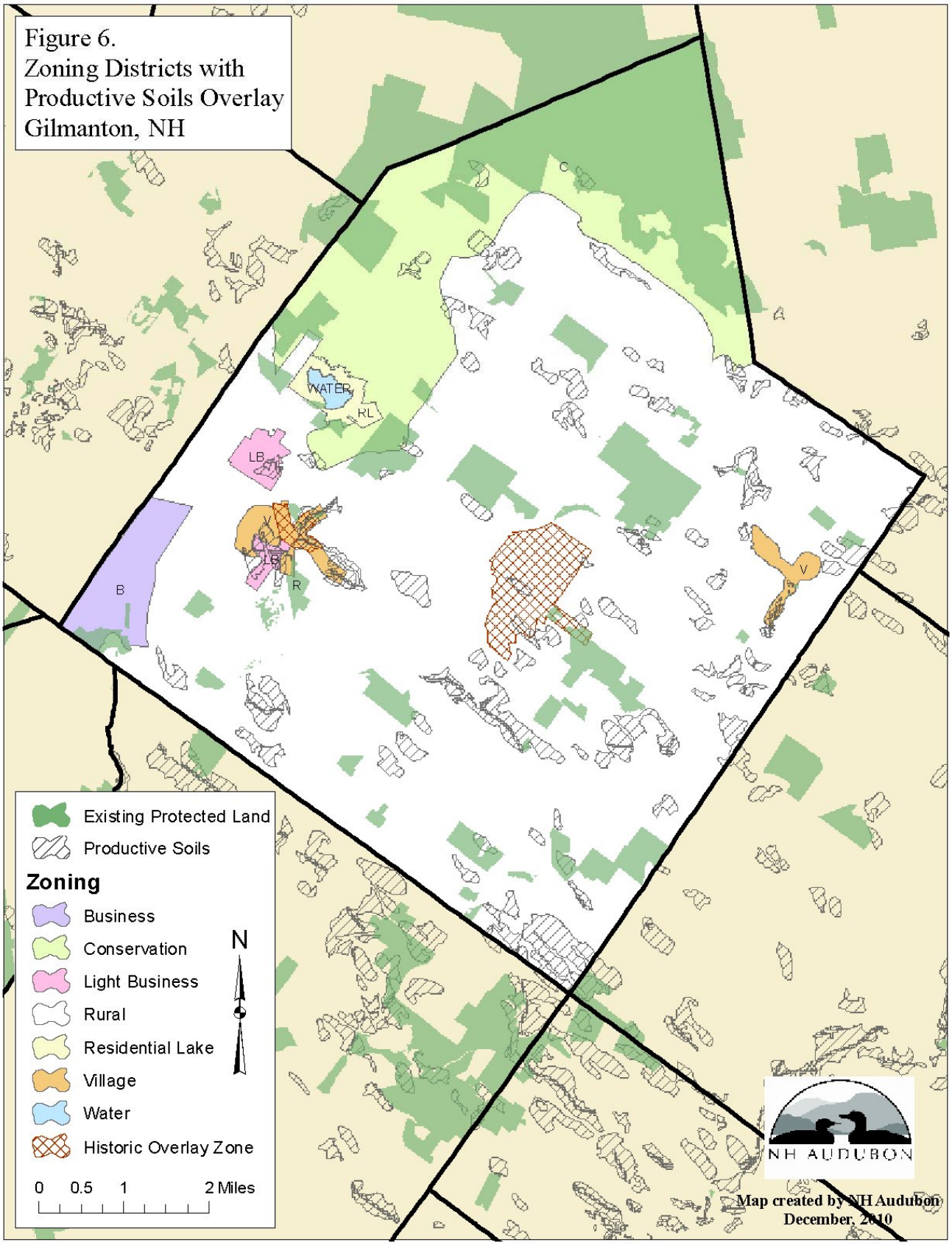
Figure 6.
Zoning Districts with
Productive Soils Overlay
Gilmanton, NH
C
WATER
RL
LB
V
LB
R
B
V
Existing Protected Land
Productive Soils
Zoning
Business
Conservation
Light Business
Rural
Residential Lake
Village
Water
Historic Overlay Zone
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

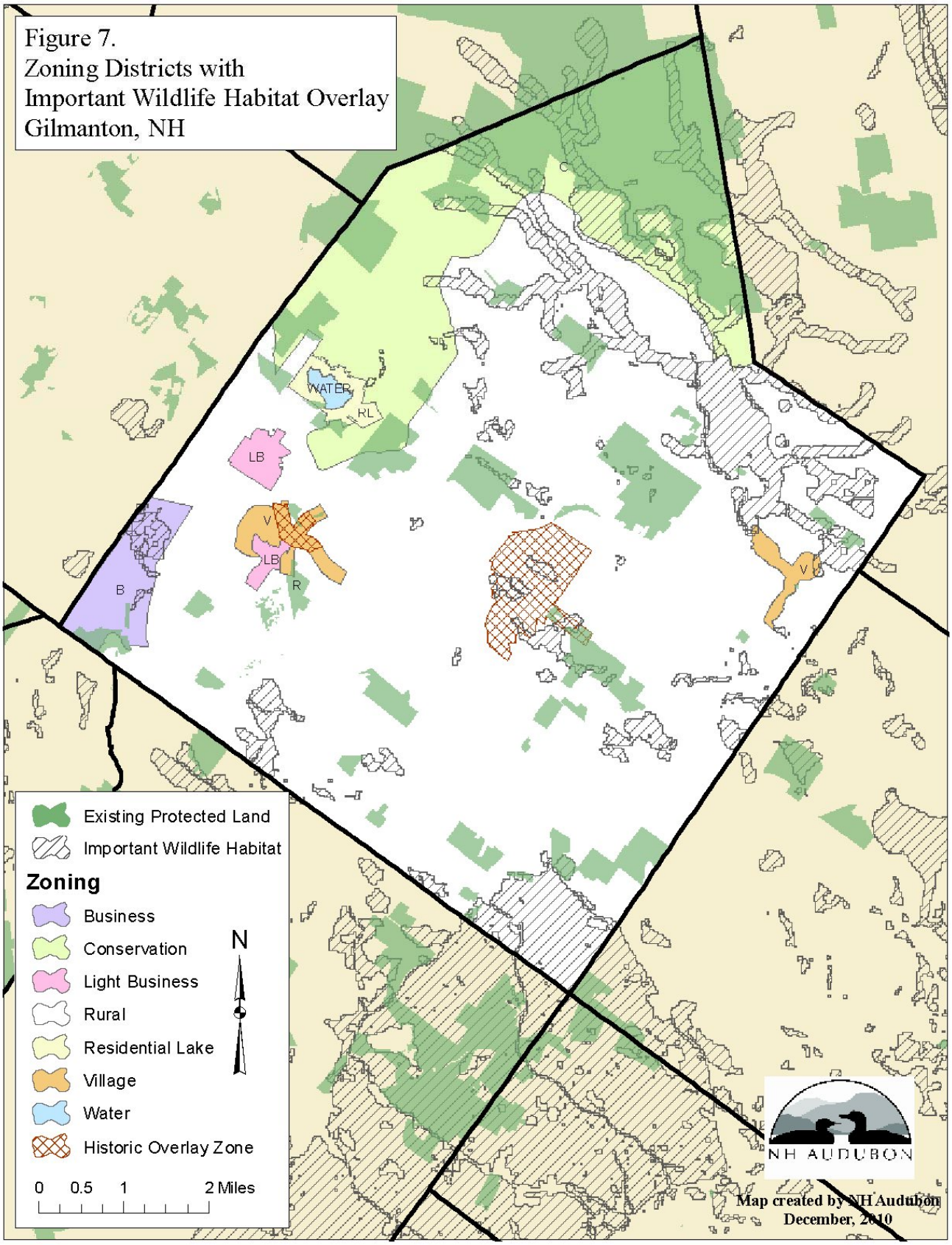
Figure 7.
Zoning Districts with
Important Wildlife Habitat Overlay
Gilmanton, NH
C
WATER
RL
LB
V
LB
R
B
V
Existing Protected Land
Important Wildlife Habitat
Zoning
Business
Conservation
Light Business
Rural
Residential Lake
Village
Water
Historic Overlay Zone
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
December, 2010

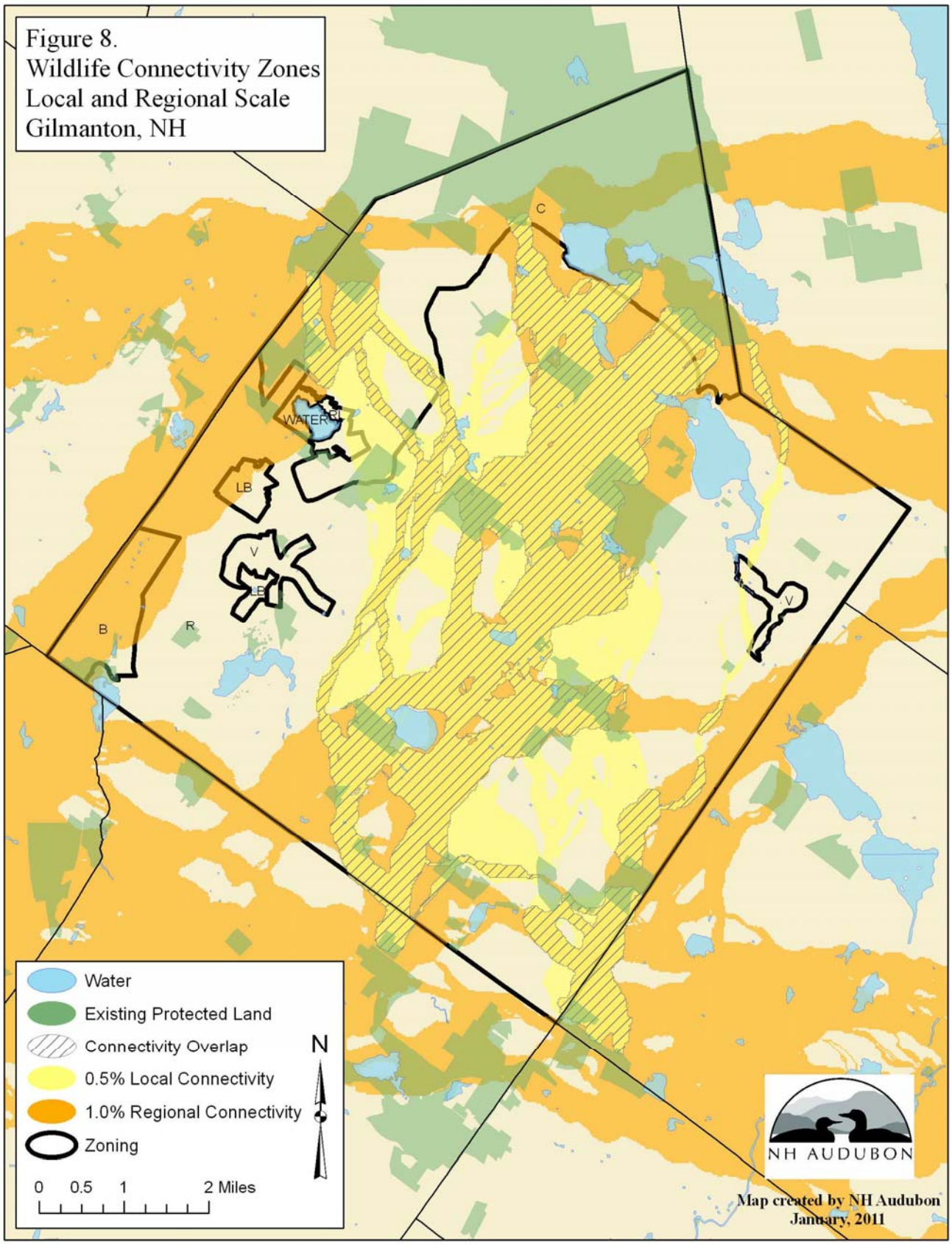
Figure 8.
Wildlife Connectivity Zones
Local and Regional Scale
Gilmanton, NH
C
WATER
CI
LB
V
LB
B
R
V
Water
Existing Protected Land
Connectivity Overlap
0.5% Local Connectivity
1.0% Regional Connectivity
Zoning
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
January, 2011

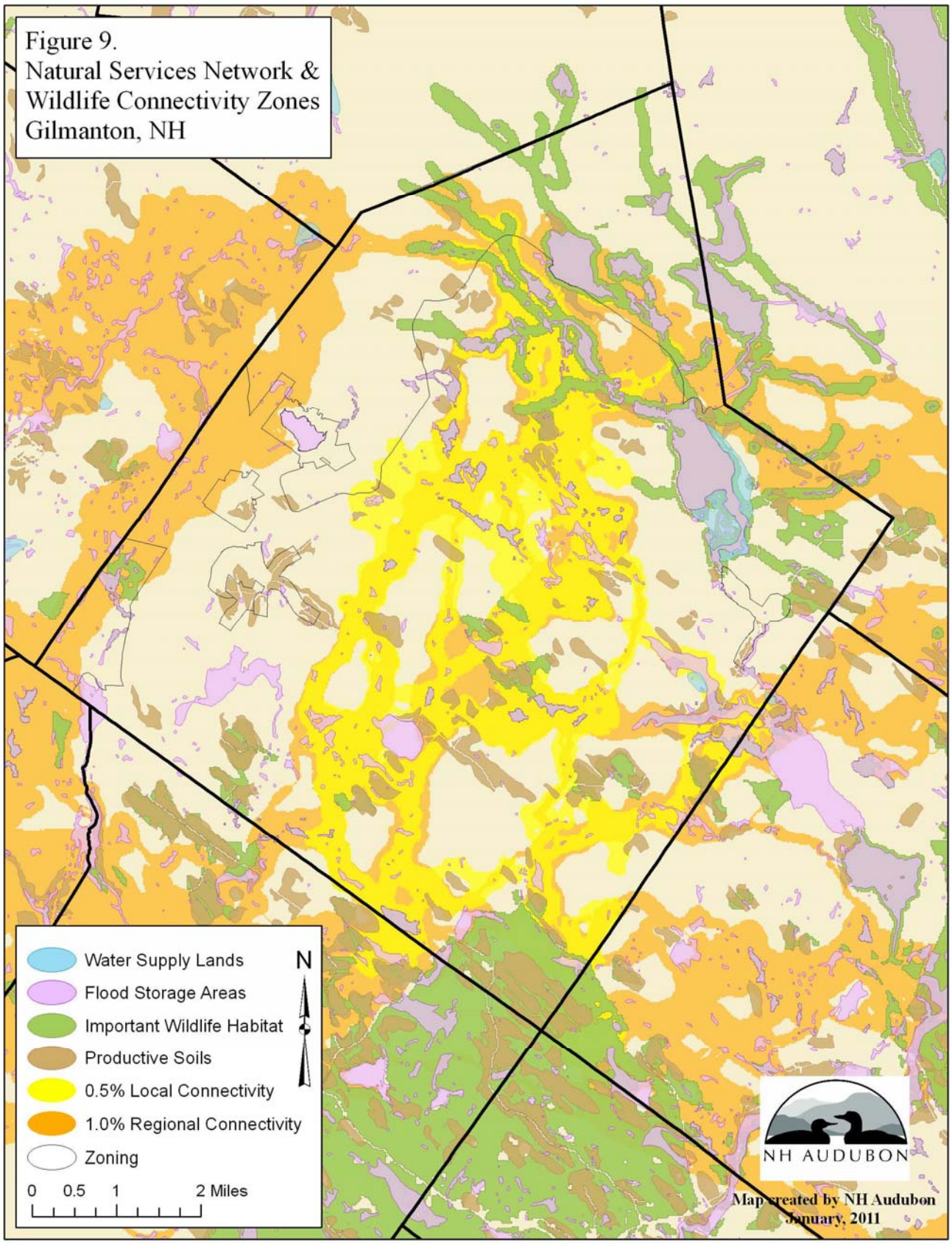
Figure 9.
Natural Services Network &
Wildlife Connectivity Zones
Gilmanton, NH
Water Supply Lands
Flood Storage Areas
Important Wildlife Habitat
Productive Soils
0.5% Local Connectivity
1.0% Regional Connectivity
Zoning
N
0 0.5 1 2 Miles
NH AUDUBON
Map created by NH Audubon
January, 2011

Appendix A. GRANIT parcels included in endpoint polygons for connectivity analysis

Analysis Polygon	Parcels in Polygon	Number of parcels
Belknap Mountain State Forest	Belknap Mountain State Forest	2
	Belknap County Recreation Area	1
	Hidden Valley CE	1
	Mitchell, C&N CE	1
	Mitchell 2006 Trust, Charles Z.	1
	Powell Associates Lot	1
	Peverly Lot	1
	Piper Mountain Conservation Area	1
	Etta and Leon Tilton Memorial Forest	1
	Frank L. Allen Forest	1
	Westergren CE	1
Blackwater Flood Control Reservoir	Blackwater Flood Control Reservoir	1
	Borden Easement	2
	Paul Mock Memorial Forest	1
Cardigan Mountain State Forest	Cardigan Mountain State Forest	2
	Brown CE	1
	Welton Falls State Forest	1
Castle in the Clouds	Castle in the Clouds	4
	Retsof/Chocorua Forestlands	1
	Ossipee Mountains Tract	2
	Thompson #2 Chocorua Forestlands	1
	Thompson #3 Sangler Brook Inc.	1
	AB Thompson Trust	3
Daniel Webster Birthplace	Daniel Webster Birthplace Historic Site	1
Franklin Falls Reservoir	Franklin Falls Reservoir	3
	Franklin Wellfield	1
	William H Thomas State Forest	7
	Wade State Forest	1
Gile State Forest	Gile State Forest	2
	Woods Without Gile	1
	Morgan Pond	1
	Springfield Town Forest - Royal Arch Lot	1
	French #1	1
	Webb	4
	Langenau Forest	1
	Colby Sanctuary	1
Great Gains Memorial Forest	Great Gains Memorial Forest	2
	Rowell Lot	1

Appendix A continued

Analysis Polygon	Parcels in Polygon	Number of Parcels
Hersey Mountain	Ness	1
	Gallup	1
	DeJeager	1
	George Duncan State Forest	1
	Beale	3
	Stitzinger	1
	Mike Burke Memorial Forest	1
	Knox Mtn Tree Farm	3
Meader Conservation Easement	Meader	3
	Mokler	2
	DiCuollo	1
Merrimack River State Forest	Merrimack River State Forest	1
	Gold Star Sod Farms, Inc.	3
	Sanborn - Agric. Pres. Rest.	1
	Georgaklis	2
Mount Kearsarge State Forest	Mount Kearsarge State Forest	4
	Kearsarge WMA	1
	Reineer Woodland Conservancy	1
	Andover Village District Land	1
	Rollins State Park	2
Robie Forest	Robie Forest	1
State Forest Nursery	State Forest Nursery	1
	Merrimack County Farm	4
	Cabot Memorial Forest	1
Webster Farm	Fife Trust	2
Webster Lake WMA	Webster Lake WMA	1

Summary of Recommendations

This section of the report consolidates recommendations from both the Smart Growth Assessment and the Wildlife Habitat and Natural Resource review. The first group of recommendations pertains to potential revisions of land use planning documents, and is organized by document. The second group of recommendations pertains to actions and policies that could be undertaken by Town government, including the Select Board, Planning Board, Conservation Commission, Heritage Commission, and Department of Public Works. Before implementing any of the following recommendations, it is critically important to refer back to the previous sections, which provide detailed information and justifications. (References to pertinent smart growth principles and natural resource topics are provided at the end of each recommendation.)

Document Revisions

Master Plan

Vision Statement

- Consider adding language to the Vision that addresses promotion of energy efficiency. (*Energy Efficiency*)

Potential New Sections

- Consider including a Future Land Use section, providing a broad picture of the patterns of land use that the town wishes to see over the next 10 – 20 years (RSA 674.2.II.b). (*Principle 1*)

Recommendations

- Consider adding recommendations pertaining to energy efficiency of Town infrastructure, equipment, and activities. (*Energy Efficiency*)

- Consider incorporating the Town Forest Recommendations from the Natural Resources Inventory directly into the Master Plan Recommendations. (*Forests and Forestry; Principle 4*)

- Consider adopting recommendations such as:
    - Develop/maintain/implement a wellhead protection plan.
    - Adopt an aquifer protection ordinance to ensure adequate recharge and prevent contamination of important aquifers.
    - Review and revise the Town's aquifer protection regulations based on the State's most recent stratified drift aquifer maps.
    - Develop a groundwater quality map for the Town.
    - Work with adjacent towns to protect shared aquifers.

  (*Groundwater; Principle 6*)

- Consider adopting recommendations such as:
    - Encourage flexible road widths within subdivisions that minimize paving while ensuring adequate and safe access for emergency response vehicles.
    - Review and revise policies and regulations to minimize impervious surfaces.

  (*Impervious Surfaces*)

- Consider adopting recommendations such as:
    - Review and revise policies and regulations to minimize destruction of natural vegetation during construction activities.
    - Review and revise policies and regulations to encourage the use of native species in landscaping.
    - Review and revise policies and regulations to discourage the use of plants that require significant inputs of water and nutrients in landscaping.
    - Encourage landscaping designs that reduce heating and cooling costs.

  (*Energy Efficiency, Green Infrastructure, Landscaping and Natural Vegetation*)

- Consider adopting a recommendation pertaining to dark sky preservation. (*Light Pollution; Principle 6*)

- Consider adopting a recommendation to review and revise local policies and regulations to ensure that future development will minimize stormwater runoff and erosion potential. (*Stormwater Management and Erosion Control; Principle 6*)

- Consider including a recommendation such as "Adopt policies to minimize the extent of terrain alteration associated with development in order to maintain natural hydrologic patterns, maintain rural character, and protect property and public safety." (*Terrain Alteration*)

- Consider adding a recommendation to adopt land use policies that manage cumulative impacts of land use within a watershed. (*Watersheds; Principle 6*)

- Consider adding a recommendation to collaborate in regional efforts to protect the Winnipesaukee and Suncook watersheds. (*Watersheds; Principles 6, 8*)

Hazard Mitigation Plan

- Consider including a map of natural hazards in the Hazard Mitigation Plan, identifying areas prone to flooding as well as formally recognized floodplains, areas vulnerable to wildfire, and areas of steep slopes. (*Floodplains*, *Forests and Forestry*, *Natural Hazards, Steep Slopes and Ridgelines*, *Stormwater Management and Erosion Control*)

- Consider acknowledging that the frequency and intensity of major precipitation events appear to be increasing. (*Floodplains, Natural Hazards*)

Natural Resources Inventory

- Consider identifying local priorities for open space protection that include core areas of high ranking wildlife habitat as identified in the NH Wildlife Action Plan. (*Wildlife Habitat*)

- Consider adopting strategies to maintain wildlife connectivity zones within the Town. (*Wildlife Habitat*)

Zoning Ordinance

Article I (Preamble)

- Consider including protection of important natural resources, including agricultural lands, forests, groundwater, surface waters, wetlands, highly ranked wildlife habitat, and wildlife connectivity zones, in the purposes of the Zoning Ordinance. (*Agriculture and Productive Soils; Forests and Forestry; Green Infrastructure; Groundwater; Shorelands, Surface Waters, and Wetlands; Watersheds; Wildlife Habitat*)

Article II (Districts)

- Consider including protection of natural resources in purposes of the Conservation and Rural districts. (*Agriculture and Productive Soils; Forests and Forestry; Green Infrastructure; Groundwater; Shorelands, Surface Waters, and Wetlands; Steep Slopes and Ridgelines; Watersheds; Wildlife Habitat*)

- Consider expanding the Conservation District. (See Section 5 of this document.) ((*Agriculture and Productive Soils; Forests and Forestry; Green Infrastructure; Growth Management and Sprawl; Watersheds; Wildlife Habitat*)

- Consider expanding the Village Districts to promote nodal development and discourage strip development, and providing incentives for locating development within them. (See Section 5 of this document.) (*Growth Management and Sprawl; Principle 1*)

- Consider adopting a natural resources overlay district, including agricultural lands and productive soils, wetlands, shoreland buffers, steep slopes, ridgelines, and highly ranked wildlife habitat (identified in the NH Wildlife Action Plan) (see "Agricultural Incentive Zoning" [Chapter 1.7], "Shoreland Protection: The Importance of Riparian Buffers" [Chapter 2.6], "Steep Slope and Ridgeline Protection" [Chapter 2.2] , "Wetlands Protection" [Chapter 2.4] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* ; Lakes Region Planning Commission. 2005. *Regulating Development on Steep Slopes, Hillsides, and Ridgelines*). (*Agriculture and Productive Soils; Shorelands, Surface Waters, and Wetlands; Steep Slopes and Ridgelines; Wildlife Habitat; Principle 6*)

- Consider establishing a Forest Conservation District, with a larger (e.g., 20- to 50- acre) minimum lot size, in appropriate areas, or a natural resources overlay district that addresses large unfragmented forest blocks. The Lyme, NH zoning ordinance includes a Mountain and Forest Conservation District, which could provide a useful model to work from. (www.lymenh.gov/Public_Documents/LymeNH_Regs/regs/ZoneOrd.doc) (*Forests and Forestry, Green Infrastructure, Watersheds, Wildlife Habitat*)

- Consider adopting an aquifer overlay district. (See Chapter 2.5, "Protection of Groundwater and Surface Water Resources," in *Innovative Land Use Planning Techniques.*) (*Groundwater; Principle 6*)

- Consider adopting overlay districts to address site-specific hazards (i.e., Steep Slopes, Wild Fire hazard areas). (*Forests and Forestry, Natural Hazards, Steep Slopes and Ridgelines, Stormwater Management and Erosion Control*)

Article III (General Provisions Applicable to All Districts)

- Consider encouraging the use of permeable pavement in Off-Street Loading and Parking specifications (H). (*Impervious Surfaces, Stormwater Management and Erosion Control*)

- Consider revising section on Removal of Natural Material (I) to include revegetation as well as regrading, and to include areas within 100 feet of a wetland or waterbody, and areas within 100 feet of a property line in order to protect abutters from erosion and washouts. (*Stormwater Management and Erosion Control*)

Article IV (Zoning District Regulations)

- Consider permitting Open Space subdivisions by right in the Conservation and Rural districts, with conventional subdivisions allowed by Special Exception (Table 1). (*Agriculture and Productive Soils; Forests and Forestry; Green Infrastructure; Growth Management and Sprawl; Shorelands, Surface Waters, and Wetlands; Watersheds; Wildlife Habitat*)

- Consider adopting a *maximum* front setback and driveway length for the Conservation and Rural districts to minimize fragmentation effects (Table 2). (*Forests and Forestry, Green Infrastructure, Wildlife Habitat*)

- Consider adopting a maximum impervious lot coverage standard for each zoning district (Table 2). (*Impervious Surfaces, Stormwater Management and Erosion Control, Watersheds*)

- Consider permitting and promoting new multi-family housing to help diversify the town's housing stock and provide more affordable housing opportunities. (*Principle 3*)

Article V (Open Space Subdivision)

- Maintain and utilize the flexibility in street design available with Open Space Subdivision. (*Principle 5*)

Potential New Articles

- Consider adopting an ordinance to address impervious surfaces. ("Permanent [Post-construction] Stormwater Management" [Chapter 2.1] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses impervious surfaces.

- Consider adopting a landscaping ordinance for the Business, Light Business, and Village zoning districts. ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance pertaining to landscaping. This model ordinance includes a Special Provision that calls for minimizing site disturbance and retaining existing vegetation whenever possible. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast.)

- Consider adopting a stormwater ordinance. ("Permanent [Post-construction] Stormwater Management" [Chapter 2.1] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for a zoning ordinance article that addresses stormwater management and information about pertinent existing ordinances in New Hampshire.)

Subdivision Regulations

Section I (Authority and Purpose)

- Consider including provision for protecting natural resources in Purpose (Section I B) of Subdivision Regulations. (*Agriculture and Productive Soils; Forests and Forestry; Groundwater; Shorelands, Surface Waters and Wetlands; Wildlife Habitat; Principle 6*)

- Consider adding provision for encouraging energy efficiency in the Purpose (Section I B) of Subdivision Regulations. (*Energy Efficiency*)

Section II (Preliminary Conceptual Consultation Phase)

- Consider requiring Preliminary Conceptual Consultation for subdivisions in the Rural and Conservation districts. This consultation would provide the opportunity to identify any areas of the proposed site with important natural resources and to determine appropriate strategies for their protection during layout of the subdivision. (*Agriculture and Productive Soils; Floodplains; Forests and Forestry; Green Infrastructure; Groundwater; Natural Hazards; Shorelands, Surface Waters, and Wetlands; Steep Slopes and Ridgelines; Watersheds; Wildlife Habitat*)

OR

- Consider requiring Preliminary Conceptual Consultation for subdivisions involving
    - agricultural lands and productive soils (*Agriculture and Productive Soils*)
    - soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation. (*Floodplains, Natural Hazards*)
    - forest lands of 12 acres or more (*Forests and Forestry, Green Infrastructure, Wildlife Habitat*)
    - lands overlying aquifers (*Groundwater*)
    - identified natural hazard areas (*Natural Hazards*)
    - wetlands or shorelands (*Shorelands, Surface Waters, and Wetlands*)
    - steep slopes or ridgelines (*Steep Slopes and Ridgelines*)
    - highly ranked wildlife habitat or identified wildlife connectivity zones (*Wildlife Habitat*)

Section III (Application for Design Review Phase Approval)

- Consider including preservation of agricultural lands and productive soils among considerations of impacts during Design Review Phase (Section III A). (*Agriculture and Productive Soils*)

- Consider including energy conservation strategies among considerations for discussion during Design Review Phase (Section III A). (*Energy Efficiency*)

- Consider including minimization of impervious surface in considerations for short and long-term impacts of a proposal (Section III A). (*Impervious Surfaces*)

- Consider including a statement such as "Avoidance of extensive excavation, grading, and filling to the extent practicable" in considerations of proposal impacts in Application for Design Review Phase Approval (Section III A). (*Terrain Alteration, Stormwater Management and Erosion Control*)

Summary of Recommendations

- Consider including agricultural lands and productive soils among the features required for inclusion on the Design Review Phase Layout (Section III C 1 d). (*Agriculture and Productive Soils*)

- Consider including soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation in Submission and Information Requirements for Preliminary Conceptual Consultation Phase (Section III C 1 d). (*Floodplains, Natural Hazards*)

- Consider including mapped aquifers on location map required in Submission and Information Requirements for Design Review (Section III C 1 d). (*Groundwater*)

- Consider including wetland soils in Submission and Information Requirements (Section III C 1 d). (*Shorelands, Surface Waters, and Wetlands*)

- Consider including lighting plan for proposed streets in Submission and Information Requirements (Section III C). (*Energy Efficiency, Light Pollution*)

- Consider including cut and fill volumes in Submission and Information Requirements (Section III C 2). (*Terrain Alteration*)

- Consider including highly ranked wildlife habitat and identified wildlife connectivity zones in Submission and Information Requirements for Design Review (Section III C 2). (*Wildlife Habitat*)

- Consider requiring identification of special habitats such as vernal pools, deer wintering areas, and important mast stands in Submission and Information Requirements (Section III.C.2). (*Wildlife Habitat*)

Section VI (Design Standards for All Subdivisions)

- Consider adding a provision in General Guidelines (Section VI A) that the applicant shall avoid or minimize impervious surfaces and potential pollution sources on lands overlaying aquifers. (*Groundwater*)

- Consider encouraging flexible road widths within subdivisions that minimize paving while ensuring adequate and safe access for emergency response vehicles (Section VI B) *(Impervious Surfaces, Watersheds*)

- Consider including discussion of aquifer recharge and preventing groundwater pollution in the Erosion and Sediment Control Regulations (Section VI H). (*Groundwater*)

- Consider adopting special standards for subdivisions in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands. Such standards might include maximum distance from collector road, maximum driveway length, on-site water supply, and landscaping specifications. (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.) (*Forests and Forestry, Natural Hazards*)

- Consider adopting landscaping regulations for subdivisions involving new streets ("Landscaping" (Chapter 3.6) in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision regulations pertaining to landscaping. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast. (*Landscaping and Natural Vegetation*)

- Consider requiring that boundaries of wetland and shoreland buffers be permanently marked to facilitate awareness of future landowners. This can be accomplished by adding a special condition to appropriate subdivision approvals to the effect of "The wetland buffers shall be clearly and permanently marked before, during, and after construction; building permits will not be issued until the buffers are marked" or by adding such language into the Subdivision Regulations. (*Shorelands, Surface Waters, and Wetlands; Watersheds*)

- Encourage the development of interconnected streets both in the Village Districts and in any subdivisions that require the construction of roads. (*Principle 1*)

- Consider requiring the construction of sidewalks in subdivisions exceeding a threshold size. (*Principles 2, 5*)

- Strive for connectivity among all future streets. (*Principle 5*)

- Consider developing flexible road design standards for all local roads. (*Principle 5*)

- Consider providing incentives for subdivisions that preserve linkages between habitats. (*Principle 6*)

Site Plan Review Regulations

Section II. (Purpose)

- Consider including protection of natural resources in the Purpose of the Site Plan Review Regulations (Section II). (*Agriculture and Productive Soils; Forests and Forestry; Groundwater; Shorelands, Surface Waters, and Wetlands; Wildlife Habitat; Principle 6*)

- Consider including encouraging energy efficiency in the Purpose of the Site Plan Review Regulations (Section II). (*Energy Efficiency*)

- Consider revising to read "…. To protect against adverse environmental impacts from a proposed development including inadequate disposal or storage of sewage, refuse, and other wastes; **contamination of aquifers; loss of aquifer recharge area;** and/or inadequate surface drainage." (Section II) (*Groundwater*)

Section VI. Procedure for Site Plan Review

- Consider requiring Pre-Submission Discussion for site plans in the Rural and Conservation districts. This discussion would provide the opportunity to identify any areas of the proposed site with important natural resources and to determine appropriate strategies for their protection during development of the site plan. Such strategies can ultimately be incorporated as special conditions of site plan approval. (*Agriculture and Productive Soils; Floodplains; Forests and Forestry; Green Infrastructure; Groundwater; Natural Hazards; Shorelands, Surface Waters, and Wetlands; Steep Slopes and Ridgelines; Watersheds; Wildlife Habitat*)

OR

- Consider requiring Pre-Submission Discussion for site plans involving
    - agricultural lands and soils (*Agriculture and Productive Soils*)
    - soils subject to frequent or occasional flooding and lands below the 1% flood frequency (100-year flood) elevation. (*Floodplains, Natural Hazards*)
    - forest lands of 12 acres or more (*Forests and Forestry, Green Infrastructure, Wildlife Habitat*)
    - lands overlying aquifers (*Groundwater*)
    - identified natural hazard areas (*Natural Hazards*)
    - wetlands or shorelands (*Shorelands, Surface Waters, and Wetlands*)
    - steep slopes or ridgelines (*Steep Slopes and Ridgelines*)
    - highly ranked wildlife habitat or identified wildlife connectivity zones (*Wildlife Habitat*)

Section V (Definitions)

- Consider including wetland soils in Definitions. (*Shorelands, Surface Waters, and Wetlands*)

Section VII (Application Requirements)

- Consider adding agricultural lands and productive soils to features for which location and boundary information is required on a Site Plan (Section VII B 3 j). (*Agricultural Lands and Productive Soils*)

- Consider including location of stratified drift aquifers in Application Requirements (Section VII B 3 j). (*Groundwater*)

Summary of Recommendations

- Consider including description of energy conservation features of exterior lighting plan in Application Requirements (Section VII B 3 q). (*Energy Efficiency*)

- Consider including total impervious surface and percent of project area in Application Requirements (Section VII B 3). (*Impervious Surfaces, Watersheds*)

- Consider requiring a plan for on-site stormwater management (Section VII B 3). (*Stormwater Management and Erosion Control, Watersheds*)

- Consider changing "marshes" to "wetland soils" in Application Requirements (Section VII B 3 h). (*Shorelands, Surface Waters, and Wetlands*)

- Consider including areas of steep slopes in Application Requirements (Section VII B 3). (*Steep Slopes and Ridgelines*)

- Consider including cut and fill volumes in Application Requirements (Section VII 3). (*Terrain Alteration*)

- Consider including highly ranked wildlife habitat (as identified in NH Wildife Action Plan) in Application Requirements (Section VII B 3). (*Wildlife Habitat*)

- Consider requiring identification and protection of special habitats such as vernal pools, deer wintering areas, and important mast stands in site plans. (See Voluntary Practices in Section 7 of this document.) (*Wildlife Habitat*)

Section VIII (Requirements for Site Plan Approval)

- Consider including provision that access, parking, and loading areas shall be designed and constructed so as to minimize impervious surfaces in Requirements for Site Plan Approval (Section VIII A). (*Impervious Surfaces*)

- Consider adopting minimum standards for parking. (*Principle 2*)

- Consider allowing permeable pavement for driveways, parking lots, and sidewalks with Board approval (Section VIII A). (*Impervious Surfaces, Watersheds*)

- Consider requiring sloped (Cape Cod) curbing where curbing is required (Section VIII A). (*Wildlife Habitat*)

- Consider restricting grades of sidewalks, parking lots, and driveways (Section VIII A 6). (*Steep Slopes and Ridgelines*, *Stormwater Management and Erosion Control*)

- Consider including measures to prevent groundwater contamination and maintain aquifer recharge areas in Environmental Protection Requirements for Site Plan Approval (Section VIII D) for lands overlaying mapped aquifers. (*Groundwater*)

- Consider adopting special standards for site plans in the Rural and Conservation districts (or in identified wildfire hazard areas) to minimize the possibility of wildland fires involving structures and structural fires involving wildlands. Such standards might include maximum distance from

collector road, maximum driveway length, on-site water supply, and landscaping specifications (Section VIII.D). (See National Fire Protection Association. 2008. NFPA 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire.)(Building code standards, such as inflammable roofing and siding materials, may also be desirable.) (*Forests and Forestry, Natural Hazards*)

- Consider adopting design standards for outdoor lighting (Section VIII.D). (The New England Light Pollution Advisory Group [NELPAG] provides model language for an outdoor lighting ordinance to address light pollution, based on successful ordinances in Kennebunkport, ME and Tucson, AZ [www.cfa.harvard.edu/nelpag/ordbylaw.html] and the International Dark Sky Association provides simple guidelines that could serve as design standards in subdivision and site plan regulations. [www.darksky.org/programs/simple-guidelines-for-lighting-ordinances.php]) (*Energy Efficiency*, *Light Pollution, Wildlife Habitat, Principle 2*)

- Consider strengthening provisions to encourage the retention of natural vegetation, use of native species, and use of landscaping to reduce heating and cooling costs; and discourage use of species that require significant inputs of water and nutrients (Section VIII.C). ("Landscaping" [Chapter 3.6] in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* provides model language for subdivision regulations pertaining to landscaping. *Integrated Landscaping: Following Nature's Lead* provides information about sustainable landscaping systems for developments in the Northeast. (*Energy Efficiency, Landscaping and Natural Vegetation)*

- Consider including statement such as "Extensive excavation, grading, and filling shall be avoided to the extent practicable" in Environmental Protection Requirements for Site Plan Approval (Section VIII.D). (*Terrain Alteration*)

- Consider requiring that boundaries of wetland and shoreland buffers be permanently marked to facilitate awareness of future landowners. This can be accomplished by adding a special condition to appropriate site plan approvals to the effect of "The wetland buffers shall be clearly and permanently marked before, during, and after construction; building permits will not be issued until the buffers are marked" or by adding such language into the Site Plan Review Regulations (Section VIII.D). (*Shorelands, Surface Waters, and Wetlands; Watersheds*)

Actions and Policies

- Consider developing a Green Infrastructure or Open Space plan for the Town.
- Consider following the recommendation in the Natural Resources Inventory to prohibit or restrict new potential contamination sources in well-head protection areas.
- Review "Erosion and Sediment Control During Construction" (Chapter 2.8) in *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development* and adopt new regulations and standards as appropriate.
- Consider providing incentives for locating development within Village Districts.
- Consider having maps of agricultural lands and productive soils, large unfragmented forest blocks, flood storage areas, water supply lands, and highly ranked wildlife habitat (as identified in the NH Wildlife Action Plan) available at Town Hall in electronic and paper form.
- Consider installing community septic and water systems in the Village Districts. (*Principle 1*)
- Consider developing a road network plan with requirements for road connectivity. (*Principle 1*)
- Consider constructing sidewalks in the Village Districts. (*Principle 2*)
- Encourage residential development in close proximity to existing services. (*Principle 3*)
- Continue to promote the local Farmer's Market as a venue for local farmers to sell their produce and as a means of keeping local farms in the public eye. (*Principle 4*)
- Explore working with current farmers, USDA, and NRCS to purchase development rights for agricultural lands. (*Principle 4*)
- Work with NH DOT, using the Context Sensitive Solutions method, to develop and implement traffic calming in the Village Districts. (*Principle 5*)
- Explore greater representation on the Region 3 Regional Coordinating Council (for public transportation) and the Lakes Region Transportation Technical Advisory Committee (for issues related to regional transportation). (*Principle 5*)
- Continue collaboration with regional land trusts to protect parcels that include important habitats. (*Principle 6*)
- Increase publicity of Planning Board activities and availability of planning documents. (*Principle 7*)
- Consider applying to Plan NH for a charrette designed to increase density in the Village Districts or to address anticipated development in the southwestern portion of town. (*Principle 7*)

Summary of Recommendations

- Maintain communication and involvement with neighboring communities on environmental issues and development proposals (Principle 8).

- Coordinate land protection and planning efforts with adjacent communities (Principle 8).

- Continue to collaborate with surrounding towns on projects such as road construction and infrastructure needs (Principle 8).

- Notify surrounding communities of any proposed developments of regional impact per RSA 36: 54-57 (Principle 8).

- Increase involvement in regional transportation planning efforts through the Transportation Technical Advisory Committee and the Region 3 Regional Coordinating Council for Public Transportation (Principle 8).

Balancing Development and Rural Character:

Voluntary Practices to Protect Important Wildlife Habitat Features

During Development and Other Land Use Changes

Prepared by

New Hampshire Audubon
and
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Voluntary Practices to Protect Important Wildlife Habitat Features

Introduction

Voluntary practices provide opportunities for communities to encourage protection of habitat and other natural resources during development in the absence of regulations. Voluntary practices are particularly useful tools for protecting habitat features that are scattered on the landscape, such as deer wintering areas or vernal pools. Such features benefit from flexible approaches to protection that can be designed through discussions between planners and developers, rather than by "one-size-fits-all" regulations. Voluntary practices also can be incorporated into incentive approaches, such as density bonuses, to protect natural resources in communities with minimal land use regulations.

Successful application of voluntary practices depends on pre-application conferences between planners and developers. These meetings provide an opportunity for developers to share ideas about prospective use of a land parcel before investing in surveys and engineering studies, and for municipal planners to share concerns about natural resources associated with the parcel that are important to the community. The parties can then develop consensus on an approach to development that protects the important resources, and the points of agreement become special conditions of the subdivision or site plan permit.

This document includes voluntary practices designed to protect the following habitats:

Deer wintering areas
Important mast stands
Headwater streams
Natural vegetation
Raptor nest trees
Shorelands and riparian areas
Vernal pools

For each topic, we provide a brief issue statement, objectives for the voluntary practices, a justification and benefits section, a list of implementation strategies, and technical references.

We welcome comments and suggestions from municipalities on the usefulness of these practices, ways in which they might be improved, and additional topics for which voluntary practices might be helpful.

Deer Wintering Areas

Issue: Human activity in deer wintering areas can have negative impacts on both people and deer.

Objectives

- Avoid destruction of deer wintering habitat.
- Minimize disturbance of wintering deer from human activity and domestic dogs.
- Minimize negative interactions between deer and people, including
    - Wildlife/vehicle collisions
    - Human exposure to wildlife-borne diseases
    - Property damage from foraging deer.

Justification/Benefits

The white-tailed deer is both ecologically and economically important in New Hampshire. Deer hunting has a significant economic impact in the state, with estimated annual expenditures of $47,344,000 associated with big game hunting in New Hampshire, based on data from 2001 (U.S. Dept. of the Interior and U.S. Dept. of Commerce 1993). Deer are also popular subjects for wildlife observation and photography. Such "non-consumptive use" of wildlife (not specifically deer) in New Hampshire generated an estimated $325,658,000 in 2001, more than half of which was spent by non-residents.

Local deer densities in New Hampshire range from less than 6 per sq. mi. in the White Mountains to 16-19 per sq. mi. in the southern part of the state, and average about 10 per square mile statewide (Gustafson 2004).

New Hampshire is near the northern limit of the white-tailed deer's range, which extends to the north shore of the Saint Lawrence River in Quebec (Halls 1984). In northern areas with severe winters, deer maintain distinctly different ranges during the winter and during the milder part of the year.

Nutritional stress during severe winters may result in more than 30% mortality of adults, as well as high mortality of fawns born the following spring (Lavigne 1999).

Studies in the northeast indicate that deer begin to move from summer/fall range to wintering areas when snow depths reach approximately 15 inches (Tierson et al. 1985). They commonly move 4-5 miles between summer and winter ranges, and may move more than 25 miles (Lavigne 1999).

Roads do not pose barriers to deer movement, as they do with many other species of wildlife. Deer commonly cross highways and other busy roads. In fact, collisions with vehicles on New Hampshire highways have killed more than 1000 deer annually since 1989 (Gustafson 2004). Based on recent population estimates of approximately 82,000 deer statewide, about 12% of the deer herd is lost to road mortality each year. With increasing numbers of vehicles, there is increasing mortality due to collisions. Deer killed by cars has increased from 662 in 1987

(accounting for 80% of all deer mortality) to 1292 in 2003 (91 % of total mortality (Gustafsen 2004). From 1995 to 2003, there were seven years in which collisions accounted for 93% or more of deer mortality, and three years in which vehicle collisions caused 96% of all deer mortality.

Deer wintering areas occur in softwood stands of various types, often in riparian areas. In northern New Hampshire, deer wintering areas are typically located in low elevation stands of red spruce, balsam fir, and northern white cedar. These areas may cover areas of more than 1000 acres and support hundreds of deer. In the southern part of the state, wintering areas are typically scattered patches of hemlock as small as a half acre. Such small wintering areas accommodate 20 or 30 deer during bouts of severe weather and 15 inches or more of snow, but deer in southern New Hampshire do not typically spend long periods of time in these "yards." In mild winters, deer may not "yard up" at all in southern New Hampshire (Gustafson, pers. commun.).

Deer wintering areas consist of core areas with dense coniferous trees that reduce snow accumulation and provide shelter from wind, adjacent to mixed hardwood and coniferous trees that provide an accessible food supply. Softwood canopy height of at least 35 feet and average canopy cover of 65-70% are required to provide functional shelter (Reay et al.1990).

Deer are hosts of the black-legged tick (or "deer tick"), which is a vector in the transmission of Lyme disease. Black-legged ticks occur throughout most of southern and central New Hampshire. Many factors influence the occurrence of black-legged ticks and incidence of Lyme disease among humans, but in general, areas of high deer densities are more likely to exhibit greater black-legged tick abundance and higher Lyme disease incidence rates in humans (Gustafsen 2004).

Deer and human populations have increased since the early 1980's, especially in the southern part of the state, resulting in greater potential for human-deer conflicts. Calls to Wildlife Services for assistance with deer damage rose sharply form 1988 through 1993, but have remained fairly consistent since then. From 1993 to 2002, requests that were agriculturally related accounted for about half of all calls, varying from 39-62% for that time period (Gustafsen 2004).

Implementation Strategies

- Identify deer wintering areas on site map, including core shelter area, surrounding hardwood buffer extending at least 200 feet from perimeter of core, and corridors connecting wintering areas to surrounding habitats.

- Avoid any clearing or other construction activity within identified deer wintering areas.

- Locate houses to discourage winter intrusion of humans and domestic dogs into identified wintering areas.

- Locate roads to avoid fragmenting of deer use areas, and plan for low traveling speeds to minimize the potential for vehicle-deer collisions.
- Install fences around residential properties adjacent to buffer habitat to discourage intrusions of humans and dogs.

- Avoid landscaping techniques that attract deer into the interior of the neighborhood.

- Discourage intentional feeding of deer, and encourage fencing of gardens to reduce attraction of deer to residential properties.

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Floodplain Forests

Issue: Clearing floodplain forests increases bank erosion and downstream flood damage and destroys important wildlife habitat.

Objectives:

- Protect floodplain forest vegetation to mitigate flood damage and maintain biodiversity.
- Minimize recreational activity in floodplain forests to prevent soil compaction and wildlife disturbance.

Justification/Benefits

A floodplain is a valley floor where water spreads out after overtopping the banks of a stream (Gordon et al. 1992, Riley 1998).

Annual shallow river flooding is common in the northern United States during spring snowmelt (Daniels and Daniels 2003).

The timing, duration, and depth of flooding are important influences on floodplain vegetation (Mitsch and Gosselink 1986, McKevlin et al. 1997).

In New Hampshire, floodplain forests occur primarily along third and higher order rivers (Sperduto 2005).

Floodplain plants are specially adapted to tolerate inundation for part of the year (Mitsch and Gosselink 1986, Verry et al. 2000).

Small elevation changes within a floodplain result in large changes in the depth and duration of flooding, and in the resulting plant communities (Mitsch and Gosselink 1986).

Long histories of stream meanders, erosion, and deposition create variable topography within floodplains, resulting in complex vegetation patterns. Floodplain systems often include sloughs, oxbows, shrub swamps, wet meadows, and vernal pools, as well as floodplain forests.

Two major types of floodplain forests in occur in northern New Hampshire and the White Mountains. These forests develop along rivers with floods of high intensity and short duration that result from mountain runoff. One type consists primarily of sugar maple, red oak, ironwood, white ash, black cherry, and white pine; the other of balsam fir, red maple, white pine, and speckled alder (Sperduto 2005).

Silver maple floodplain forests occur along the Connecticut and Merrimack rivers and the lower reaches of their major tributaries. White ash, American elm, hackberry, and Eastern cottonwood also may grow in these forests (Sperduto 2005).

Red maple dominates the floodplain forests along smaller rivers in central and southern New Hampshire. These forests also may include black ash, black cherry, and ironwood (Sperduto 2005).

During floods, floodplain forests slow water movement, capture sediment and nutrients, and shelter aquatic organisms from strong currents (Gordon et al. 1992).

Floodplain forests provide buffers between developed areas and waterways (Daniels and Daniels 2003).

Floodplain forests facilitate the recharge of aquifers during periods of inundation (Verry et al. 2000, Gordon et al. 1992).

Floodplain forests facilitate the transfer of nutrients from aquatic to terrestrial ecosystems by capturing organic matter and sediments from floodwaters during periods of inundation (Gordon et al. 1992).

Floodplain forests provide a natural filtering system for stormwater runoff (Daniels and Daniels 2003).

New Hampshire's floodplain forests provide important habitat for native wildlife, including wood turtle, northern leopard frog, American woodcock, northern oriole, blue-gray gnatcatcher, yellow-throated vireo, otter, eastern red bat, and silver-haired bat (NHFG 2005).

Implementation Strategies

- Avoid or minimize clearing and other construction activity within floodplain forests.
- Locate houses to discourage intrusion of pets into floodplain forests.
- Design recreational facilities to minimize impacts on floodplain forests.

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Headwater Streams

Issue: Alteration of headwater streams can degrade important aquatic habitat and affect flow regimes and water quality downstream in the watershed.

Objective

- Avoid destruction and degradation of headwater streams and adjacent riparian habitats from development and other human activities.

Justification & Benefits

Streams are categorized based on their size and relationship to the rest of the stream network. Ephemeral streams flow only during snowmelt or heavy rains; intermittent streams flow for several, but not all months of the year; and perennial streams flow year-round. First-order perennial streams are the smallest distinct channels, and originate from springs and seeps, where groundwater comes to the surface. Second-order streams are formed when two first-order streams join. Third-order streams are formed from two second-order streams, and so on up to fifth-order streams, which are large rivers.

A river's headwaters include the small streams and wetlands in the higher elevations of a watershed. Headwater streams are typically only a few feet wide and a few inches to a few feet deep. They include ephemeral, intermittent, and first- and second-order perennial streams. Headwaters also include small wetlands that are hydrologically connected to stream channels by groundwater.

Headwater streams are numerous and widespread, comprising at least 80% of the stream network in the United States (Meyer et al. 2007a).

Several comprehensive watershed surveys suggest that USGS maps show less than 20% of the actual stream network in humid regions of the country, such as the northeast (Meyer et al. 2007a).

Headwater streams and wetlands are critically important to the health and functions of the rivers they feed, and their destruction or degradation can severely impair downstream reaches. Headwaters play key roles in maintaining water quality and quantity, stream and river channel integrity, and aquatic biodiversity (Lowe and Likens 2005).

Because they are small, headwater streams are highly vulnerable to impacts from terrain alteration and other human activities.

The winding channels, streambed rocks and gravel, debris dams of logs and leaf litter, and streamside vegetation of headwater streams slow surface runoff and enable water to seep into and recharge underlying groundwater.

In the northeastern U.S., first-order streams contribute approximately 70% of the mean annual water volume in second order streams and approximately 55% of that in fourth and higher order rivers (Alexander et al. 2007).

Terrain alteration and impervious surfaces that increase the rate of flow in headwater streams can increase erosion and sedimentation along downstream reaches.

A study in northern New Hampshire documented declines of spring salamander populations in streams degraded by sedimentation (Lowe and Bolger 2002).

Heavy sediment loads retard the growth of submerged aquatic plants, clog fish and larval amphibian gills, smother fish eggs, disrupt fish behavior, and eliminate habitat for fish eggs and fry (Bjornn and Reiser 1991, Waters 1995).

Streams receive nutrients in the form of leaf litter and other debris, which supports a variety of aquatic invertebrates. Many invertebrates, their eggs and larvae are prey for small fish, salamanders, and mammals such as the water shrew.

Headwater streams remove or transform nutrients more effectively than larger streams through physical, chemical, and biological processes.

Recent research on a sampling of watersheds across North America suggests that half the nitrate removal within a river basin occurs in headwater streams (Meyers et al. 2007).

A study of eight northeastern watersheds suggests that wetlands associated with first order streams are responsible for 90% of wetland phosphorus removal (Meyers et al. 2007a).

A mathematical model based on field data from 14 headwater streams across North America suggests that 64% of inorganic nitrogen entering a small stream is retained or transformed within 1,000 yards (Meyers et al. 2007a).

Some headwater streams process organic material eight times more efficiently than fourth-order reaches downstream (Meyers et al. 2007a).

Processed organic matter forms the basis of food web for the entire river. Nutrients in the form of dissolved organic carbon, particles of fungus and leaf litter, dead plants, insects, fish and other animals, all flow downstream to support populations of other species. In Alaska, a study of fishless headwater streams concluded that enough insects and other invertebrates drifted downstream to support half of the fish population of downstream river reaches (Meyers et al. 2007a).

Headwater streams include a broad array of habitats, from cold, fast-moving brooks with alternating pools and riffles to shallow, muddy seeps, outflows of beaver ponds, and cool, clear springs. Elevation, slope, substrate, channel shape, water chemistry, and surrounding uplands all influence the aquatic life of headwater streams. Studies of three unmapped headwater streams in North Carolina documented more than 290 species of bacteria, fungi, plants, snails,

insects, crayfish, fish, and amphibians, some of which were unique to these environments (Meyer et al. 2007b).

Some fish species, including brook trout, use headwater streams for reproduction, seasonal feeding areas, and refuge during flood conditions.

Headwater wetlands also support important biological diversity. Studies have documented 274 at-risk plant and animal species in isolated wetlands, more than one-third of which are restricted to these habitats (Meyer et al. 2007).

Implementation strategies

- Conduct field survey of parcel to identify headwater streams and wetlands, including springs and seeps.
- Avoid disturbance to headwater streams and wetlands.
- Avoid terrain alteration and impervious surfaces that will increase flow rates in headwater streams.
- Avoid or minimize road crossings of headwater streams.
- Avoid construction activity within 100 ft. of ephemeral, intermittent, first and second order streams, and headwater wetlands.

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Mast stands

Issue: Development may destroy or eliminate wildlife access to stands of nut-producing trees, especially oak, beech, and hickory, which provide high value food sources important to winter survival of some wildlife species, especially black bears.

Objectives

- Ensure access to adequate fall food supply for mast-dependent wildlife.
- Minimize negative interactions between mast-dependent wildlife and people, including
    - Wildlife/vehicle collisions
    - Human exposure to wildlife-borne diseases
    - Property damage from deer and bears.

Justification/Benefits

Wild nuts, known as hard mast, are especially important food sources for native wildlife. New Hampshire's wild nut crops become available during the time of year when wildlife are preparing for winter by storing food or increasing their fat reserves.

American beech and red, white, and black oaks are the most widespread and abundant mast-producing tree species in New Hampshire. Scarlet, chestnut, and swamp white oaks; bitternut, mockernut, pignut, and shagbark hickories; beaked and American hazelnuts; and butternut also occur in New Hampshire, but are less abundant and have limited distribution in the state.

The American chestnut, formerly one of the most important mast-bearing trees in eastern North America, has nearly disappeared since accidental introduction of an Asian virus from Asia in the early 1900's. The resulting blight essentially eliminated the chestnut from New Hampshire's forests by about 1920 (Silver 1957). This loss increases the importance of the remaining mast-producing species.

Another New Hampshire mast-bearing tree, the butternut, is falling victim throughout its range in eastern North America to a rapidly spreading fungus disease (Schlarbaum et al. 1997).

American beech is also being severely impacted by a disease (an insect and fungus complex), which was introduced to Nova Scotia in the mid-1800's (Houston 2004) and reached New Hampshire by 1949 (Gavin and Peart 1993). Studies have shown that diseased beech forests have reduced foliage and mast compared to healthy stands (Storer et al. 2004).

Single ounces of acorns, beechnuts, hazelnuts, and hickory nuts contain 109, 163, 177, and 186 calories, respectively (compared to 15 calories in one ounce of apple) (Nutrition Data 2005).

Production of heavy wild nut crops is typically cyclical. Intervals between heavy crops are typically 2-8 years for American beech, 1-3 years for shagbark hickory, 4-10 years for white oak, 2-5 years for red oak, 2-3 years for black oak, and 4-5 years for chestnut oak (Burns and Honkala 1990). Maintaining a diversity of nut-bearing species within a local area increases the likelihood of at least one good mast crop in a given year.

New Hampshire's native nut-bearing trees typically begin to produce large numbers of nuts at 40-60 years of age (Burns and Honkala 1990).

A typical white oak tree growing in a forest probably produces about 10,000 acorns in a good year (Rogers 1990).

Wildlife species that rely heavily on nuts (hard mast) include black bear; white-tailed deer; red, gray, and northern and southern flying squirrels, eastern chipmunk, white-footed mouse, fisher, pine marten, wood duck, ruffed grouse, wild turkey, and blue jay (Martin et al. 1961).

Black bears are especially dependent on beech nuts in order to accumulate fat reserves for winter, and may concentrate on finding beech nuts above other foods during the fall. Bears may travel up to 100 linear miles outside of their normal range during the fall in order to take advantage of localized sources of nuts, as well as berries, other fruits, and agricultural crops (Miller 1975, Elowe 1987, Kolenosky and Strathearn 1987, Pelton 2003 in Timmins 2004).

Food abundance influences the age at which bears first reproduce, the size and frequency of litters, seasonal movements, and mortality rates (Pelton 1980).

Research in Maine indicates that nearly four times as many female black bears may reproduce in years of high beechnut production as do so in years of poor production (Jakubas et al. 2004).

When female bears lack sufficient fat reserves, fertilized eggs may not implant, fetuses may be absorbed, or cubs may die at birth from malnutrition (Timmins 2004).

Bears are more likely to damage field corn and raid dumpsters, bird feeders, and beehives in years of poor acorn and beechnut crops (Timmins 2004).

Bears prefer birdseed to most available natural foods (Hammond 2002).

Bears that overcome their natural wariness of humans to approach backyard bird feeders are at increased risk of being killed as nuisance bears or by collisions with vehicles (Hammond 2002).

Adult black bears followed by radio telemetry in the vicinity of the Stratton Mountain Ski Resort in Vermont stayed an average of 200-400 m from year-round houses, with avoidance distances varying by sex and season (Hammond 2002).

Implementation Strategies

- Consult with New Hampshire Fish & Game Department biologists to identify locations of
  - black bear habitat blocks
  - important mast stands

  in your area of interest.

Within or adjacent to black bear habitat blocks

- Avoid construction of houses within 300 m of important mast stands.
- Avoid construction of paved roads within 200 m of important mast stands.
- Maintain travel opportunities between important mast stands and large blocks of protected or undeveloped habitat.

In other areas

- Avoid locating house lots within important mast stands.
- Avoid locating roads between important mast stands and large blocks of protected or undeveloped habitat.

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Natural Vegetation

Issue: Some development approaches remove excessive natural vegetation from the site and replace it with generic landscaping after road and building construction have been completed.

Objectives

- Minimize loss of natural vegetation resulting from construction activities.
- Capture asset value of existing vegetation by retaining special vegetative features of the site (e.g., large diameter shade trees, clumps of native flowering shrubs, patches of native vegetation).

Justification/Benefits

Most of New Hampshire's natural vegetation consists of forests, which currently cover about 84% of the state's area. Retaining natural vegetation on developed sites reduces air pollution, soil erosion, stormwater runoff, heating and cooling costs, and glare and reflection from street traffic. Natural vegetation also provides privacy and visual screening, absorbs sound, and contributes to the aesthetic quality and uniqueness of a property, neighborhood, and community.

Generic landscaping materials often are poorly adapted for site conditions, require water and fertilizer, have a high mortality rate, and require numerous growing seasons to mature enough to provide full benefits. Natural vegetation maintains rural character by enabling new developments to blend into the New Hampshire landscape.

An acre of trees uses about 2.6 tons of carbon dioxide each year (American Forestry Association).

Large (diameter >30 inches) trees in Chicago removed approximately 70 times more polllution from the air in 1991 than small (diameter < 3 inches) trees (Nowak 1994).

The surfaces of leaves and twigs trap particulate pollution that contributes to asthma and other respiratory problems. One study found that a street with no trees had 4-100 times more dust particles in the air than a nearby street with trees (Nelson 1975).

Thirty-seven medium-sized trees on approximately 6 acres can slow stormwater runoff by 37% during heavy rain (Maine Forest Service 2000).

Pavement and roofs retain 5-30% of the rainfall from a 5- to 10-year storm; an average lawn (2-7% slope) retains 75-82%, and a forested area retains 80-95% (Anderson 2000).

Red and sugar maple, basswood, and northern red oak trees in full foliage block more than 80% of the sun's visible radiation (Moffat et al. 1994).

Air pressure from winter winds affects the air in a building by pushing out air that is already warmed and pushing in cold air that has to be heated. A building's heat loss due to wind is

proportional to wind speed squared - as wind speed doubles, heat loss quadruples (Moffat et al. 1994).
A study in central Pennsylvania found that wind speeds 2 meters above the ground were 60% lower in winter and 67% lower in summer in a residential neighborhood with 67% tree cover compared to a neighborhood with no trees (Heisler 1990).

A typical mature deciduous tree evaporates 100 gallons of water per day during sunny summer weather, using about 660,000 BTUs of energy and cooling the air as effectively as five average (10,000 BTU) air conditioners (Moffat et al. 1994).

Approximately 3-8% of current electric demand for cooling is used to compensate for urban heat islands. A city's resulting demand for electricity increases by 1.5-2% for each temperature increase of one degree Fahrenheit (Akbari et al. 1990 in McPherson 1994).

Computer simulations suggest that increasing vegetation is a more cost-effective strategy for mitigating heat island effects than reducing fuel use with energy-efficient vehicles and appliances (Akbari et al. 1988 in McPherson 1994).

Vegetation scatters transmitted sound (Aylor 1972); wind moving through foliage and birds singing from trees and shrubs can mask offensive noise (Robinette 1972).

Mature vegetation can add 6-15% to the value of developed land and 20-30% to that of undeveloped land (Minnesota Society of Arboriculture 1996).

Twenty years of extensive research suggests that 15% tree cover in urban districts, 25% in urban residential and light commercial districts, and 50% in suburban residential districts are appropriate landscaping goals (Smith 1999).

Tree replacement (including purchase, delivery, and planting) costs $214-$455 for a one-inch diameter sapling and $1360-$2890 for a 5-inch diameter tree, depending on delivery distance (information from a central New Hampshire nursery).

Implementation Strategies

- On large lots, minimize the disturbed footprint of the development.
- Identify existing trees and vegetation patches to retain for landscaping.
- Design site plan to incorporate existing trees and vegetation patches into permanent site landscaping. Large shade trees, such as oaks and maples, and native flowering shrubs, such as dogwoods and shadberries, make attractive choices for retention in lawn areas.
- Avoid locating driveways, high pedestrian-use areas, and excavation and fill sites within the root protection zones of trees and vegetation patches designated for retention .
- Protect designated trees and vegetation patches during construction activities.

Definitions

Root Protection Zone: the area extending from a tree's trunk to the dripline of its longest branches.

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Shorelands and Riparian Areas

Issue: Development near wetlands and surface waters may result in removal of natural vegetation along banks and shorelines. Naturally vegetated streambanks and shorelines protect water quality and provide important wildlife habitat. Removal of riparian vegetation can result in serious damage to water quality and overall health of aquatic habitats within a watershed.

Objectives

- Maintain functional riparian and shoreland buffers to protect water quality.
- Maintain functional riparian habitat.

Justification/Benefits:

Riparian areas are upland habitats adjacent to wetlands and water bodies.

Soils in riparian areas are highly productive. Runoff from surrounding uplands and occasional flooding concentrate nutrients, sediments, and organic debris in riparian areas and high water tables provide abundant moisture to support plant growth.

Riparian areas support lush, diverse vegetation. Many plant species growing in riparian areas are adapted to tolerate flooding.

Natural vegetation in riparian areas slows surface runoff during storm events and snowmelt, enabling water to infiltrate the soil and sediments, nutrients, and debris to settle out before reaching the wetland or water body.

During flood events, riparian vegetation stabilizes stream banks and shorelines and traps debris and sediments, thus reducing erosion and sedimentation which can degrade water quality.

Riparian vegetation physically slows floodwaters and uses large volumes of water and nutrients that would otherwise enter wetlands and water bodies.

Loss of riparian vegetation along small intermittent streams can mobilize large amounts of sediment and cause significant water level fluctuations in wetlands and waterbodies downstream (Chase et al. 1995).

Riparian habitats typically support higher biological diversity than adjacent upland and aquatic habitats (Porter 1981).

Natural vegetation along streams and rivers helps maintain suitable conditions for aquatic wildlife by shading the water, minimizing sedimentation and nutrient input, and providing large woody debris which is essential to many aquatic species.

Loss of shade increases water temperatures and temperature fluctuations, reducing dissolved oxygen available to aquatic animals and can increasing stress from toxic compounds.

Some aquatic animals, such as brook trout, require clear, cool, well-oxygenated water.

Heavy sediment loads in water inhibit the growth of algae and other aquatic plants that form the basis of the food web in these ecosystems, reduces visibility for aquatic animals, and clog gills of fish and larval amphibians.

Riparian vegetation is an important source of organic debris in aquatic habitats. This debris provides nutrients, shelter, and substrates for attachment of eggs and non-mobile invertebrates.

Reduced riparian buffers are associated with decreased in aquatic biodiversity in streams (Vannote et al. 1980).

The lush vegetation of riparian areas provides an important wildlife food source in the spring. Snow melts earlier in valleys than surrounding uplands, and large mammals seek the green vegetation of riparian areas after emerging from hibernation (bears) or leaving their wintering areas (deer and moose).

Insects and feed on lush riparian vegetation and flying species with aquatic larvae provide important food sources for breeding and migrating birds. Riparian forests tend to support higher bird density and species richness than adjacent upland forests of similar vegetative structure and composition (Stauffer and Best 1980).

Riparian vegetation provides nest sites for waterfowl, which nest in tree cavities (wood duck, common goldeneye, common and hooded mergansers) or on the ground (American black duck, mallard, ring-necked duck,) up to several hundred meters away from the water (DeGraaf and Rudis 1986).

At least 15 of New Hampshire's breeding bird species require both wetlands or water bodies for foraging and nearby upland areas for nesting (DeGraaf and Rudis 1986).

Riparian areas provide relatively safe corridors for wildlife to travel through developed areas between important habitats.

Turtles spend much of their lives in aquatic habitats but nest in upland habitats, and may travel long distances to find suitable nest sites in loose dry soil.

Wood, spotted, and Blanding's turtles travel overland for many miles during spring and summer to forage and find mates as well as to nest, and depend on dense vegetation to protect them from predators.

Star-nosed moles, water shrews, northern ribbon snakes spend their lives in riparian areas.

Implementation Strategies

- Identify and map wetlands and water bodies, including streams and wetlands not shown on USGS topographic maps, and associated buffers on or adjacent to the property.

- Delineate boundaries of buffer areas on all lots with permanent markers (e.g., metal markers attached to trees).

- Avoid removal of natural vegetation within designated buffers.

- Avoid road crossings of streams and wetlands.

- Avoid construction of roads or houses within 100 ft. of wetlands and water bodies.

- Maintain connectivity among wetland and water bodies.

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Vernal Pools

Issue: Development can destroy the temporary wetlands and adjacent upland areas that populations of vernal pool-breeding amphibians require for survival.

Objectives

- Maintain adequate upland and wetland habitat to support populations of vernal pool-breeding amphibians.
- Minimize degradation of pools and surrounding habitats by development and human activity.

Justification/Benefits

Vernal pools are small, seasonally flooded wetlands that are isolated from permanent waterbodies. Because they are isolated and typically shallow, most pools dry up during summer months, and thus do not support fish populations.

Some amphibians and invertebrates are specifically adapted to breed in temporary, fishless ponds. In New Hampshire, these species include Wood Frogs, Marbled, Blue-spotted, Jefferson, and Spotted salamanders, and fairy shrimp. Wood frog egg masses lack toxic compounds characteristic of the eggs of amphibians that breed in permanent water that have fish (Henrikson 1990, Crossland 1998 *in* Calhoun and deMaynadier 2004), and the larvae of wood frogs and pool-breeding salamanders have insufficient defensive adaptations to survive fish predation (Kats et al. 1988 *in* Calhoun and deMaynadier 2004).

Additional species of amphibians and invertebrates use vernal pools for feeding, breeding, or safe resting areas but do not require them. These include clam shrimp, fingernail clams, caddisflies, four-toed salamanders, eastern newts, spring peepers, American toads, grey treefrogs, and green frogs.

Vernal pools provide important foraging habitat for many animal species, including Spotted and Blanding's turtles. Vernal pools are critically important to these turtles in the early spring, when they emerge from hibernation with low energy reserves. Vernal pools, with concentrated invertebrate and amphibian eggs and larvae, provide rich food sources and relative safety from predators.

The total weight of amphibians breeding in a vernal pool in Massachusetts was greater than the total weight of breeding birds and small mammals in 50 acres of surrounding forest (Windmiller 1990).

Among the vernal pool amphibians, spotted and blue-spotted salamanders and wood frogs are relatively common and widespread, while others are rare. Marbled Salamanders are endangered in New Hampshire; Blanding's and Spotted turtles and Jefferson's salamanders are species of conservation concern.

Although vernal pool specialists sometimes breed in permanent waters that support fish populations, their breeding success is extremely limited in such sites, resulting in low

recruitment of juveniles and thus, low long-term survival (Petranka 1998 in Calhoun and deMaynadier 2004).

Individuals typically return to breed in the same vernal pool they grew up in (Duellman and Trueb 1986, Berven and Grudzin 1990, Sinsch 1990).

Vernal pool amphibians typically remain in a pool for about two weeks to breed and spend the rest of the year in the surrounding landscape, leaving their eggs in the pool to develop and hatch.

Researchers have found that salamanders travel at least 500 ft (152 m) from their breeding pools, and juvenile wood frogs disperse as far as ¾ mile (1200 m) from the pools in which they hatch (Calhoun and deMaynadier 2004).

More than 700 species of multi-cellular animals, including 22 vertebrates, have been reported from vernal pools in the glaciated Northeast. (Colburn 2004).

The diversity of species in a particular pool depends on many factors, including size, depth, hydrology, water chemistry, and surrounding upland habitat. Pools in close proximity often support very different species of wildlife (especially invertebrates), so each pool contributes significantly to the biodiversity of the surrounding landscape (Colburn 2004).

Vernal pools produce a substantial amount of invertebrate and vertebrate prey for other wildlife in the forest ecosystem, and are important linkages, or "stepping stones" for wildlife traveling among wetlands.

Adult vernal pool amphibians play an important role in the ecology of the surrounding forest up to 0.25 mi from a breeding pool, consuming insects on the forest floor and providing prey for other wildlife species (Semlitsch et al. 1996, Skelly et al. 1999, Wilbur 1980, Pough 1983, Ernst and Barbour 1989).

Vernal pool amphibians may play an important role in forest nutrient cycling by regulating soil invertebrates that break down organic materials (Burton and Likens 1975, Wyman 1998 in Calhoun and deMaynadier 2004).

Frogs and salamanders are vulnerable to drying out, due to their thin skin, and therefore require upland habitats that are damp and relatively cool. They survive best in areas with deep, uncompacted leaf litter, downed woody debris, and patches of canopy shade (deMaynadier and Hunter 1995, DiMaura and Hunter 2002 *in* Calhoun and deMaynadier 2004).

Wood frog numbers declined by 40% and spotted salamander numbers by 53% within four years after construction began at a development that affected approximately 25% of the forested upland within 1000 ft. of a breeding pool in Massachusetts (Windmiller in Calhoun and Klemens 2002).

Vernal pools are commonly destroyed or degraded simply because they are not recognized as important habitats.

Alteration of the uplands surrounding a vernal pool can seriously degrade its habitat value.

Existing federal and state wetlands regulations do not adequately protect vernal pools, primarily because of their small size and isolation from permanent waterbodies.

Implementation Strategies

- Identify shallow, isolated wetlands that could be seasonal pools on National Wetland Inventory (NWI) Maps and on aerial photos. Conduct field surveys to verify whether identified wetlands are seasonal pools. Document locations of vernal pools on the site plan.

- Avoid any disturbance to a pool basin and associated vegetation.

- Avoid actions that will degrade the water quality in a vernal pool.

- Avoid actions that will cause a loss of tree canopy, compaction of soil and leaf litter, creation of deep ruts, erosion, sedimentation, or alteration of vegetation and coarse woody debris within 100 feet of a pool.

- Avoid permanent construction and minimize vegetation removal and terrain alteration within 400 feet of a pool.

- Minimize roads, developments, and other fragmenting features between pools, and between pools and other wetlands.

Definitions

Mole salamander: Any salamander of the genus *Ambystoma*, all of which spend most of their time in underground burrows.

Vernal pool: A seasonal water body that is deepest in spring or fall, lacks a permanent surface water connection with other wetlands or water bodies, and lacks an established fish population (Calhoun and Klemens 2002).

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Woodland Raptor Nests

Issue: Suitable trees for raptor nests are limited in number and elimination of nest trees can lead to population declines.

Objectives

- Avoid disturbance of nesting raptors
- Avoid removal of or damage to active and potential nest trees
- Minimize disturbance to areas surrounding known and potential nest trees
- Avoid removal or degradation of critical nesting, foraging, and wintering habitat

Justification/Benefits

Raptors, or birds of prey, capture other vertebrate animals for food. Prey for various raptor species may include birds, mammals, reptiles, amphibians, fish, and large insects.

Hawks and owls are important predators in New Hampshire's forests, helping to regulate populations of prey species, particularly rodents.

Eleven species of forest-dwelling raptors breed in New Hampshire, including seven species of hawks and four species of owls.

Raptors need large home ranges compared to other forest birds in order to find enough food to survive and raise young. Saw-whet owls, New Hampshire's smallest raptors, have home ranges of about 350 acres (Simpson 1972). Larger species of hawks and owls may use areas ranging from 0.3 sq mi to more than 2 square miles (DeGraaf and Rudis 1987).

Forest-dwelling hawks build large stick nests supported by strong branches. Such nests are typically placed against the trunk of a white pine on a whorl of branches or in a three-pronged fork of a large deciduous tree.

Large trees are necessary to support hawk nests. Northern Goshawk nest trees typically have diameters of at least 12" (Speiser and Bosakowski 1987) and those of Red-shouldered Hawks, at least 17" (Nelson and Titus 1988).

Unlike songbird nests, which seldom survive a New England winter, the large stick nests of hawks persist for multiple years and may be used by the same pair or by a succession of species over the course of many breeding seasons.

Owls do not build their own nests, but use tree cavities and old nests of hawks or great blue herons.

Saw-whet Owls and Eastern Screech-Owls nest in cavities of trees at least 12" in diameter; Barred Owl cavity nests are in trees with diameters of at least 20" (Thomas et al. 1979).

Many of New Hampshire's forest raptors are relatively tolerant of human activity, and may nest within sight of houses if there is adequate habitat for hunting nearby.

Implementation Strategies

- Inspect large trees for the presence of cavities and large stick nests.

- Maintain undeveloped open space for approximately 165 ft (50 m) around trees with large stick nests.

- Retain large cavity trees when clearing for development.

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Wetlands

Issue: Development sometimes results in degradation of wetland habitat through alteration of adjacent uplands, dredging or filling of the wetland itself, or increased human activity.

Objectives
- Avoid loss and degradation of wetland habitats.
- Maintain ecological functions of wetlands.

Justification/Benefits
Wetlands occur in sites where the water table is at or near the surface of the ground. They may be transitional areas between open water and upland ecosystems, or they may be isolated from open water habitats. Wetlands occur in freshwater, saltwater, and estuarine environments.

All wetlands share three characteristics:
- very poorly drained (hydric) soils;
- flooding during all or part of the year; and
- presence of plants that are adapted to survive in flooded or saturated soils.

In New Hampshire, common wetland types include floodplain forests, swamps, marshes, peatlands, seasonal pools (see separate topic), seeps, and springs (see definitions below).

Wetlands and their associated riparian areas are ecologically important, supporting a high diversity of plant and animal life.

Wetlands play important roles in protecting water quality, storing floodwaters, and replenishing groundwater.

Wetlands protect and improve water quality by acting as filters that trap or transform excess nutrients, heavy metals, and other harmful pollutants.

Wetlands act as sponges during storm events or snow melt, absorbing large volumes of water and releasing water gradually into groundwater and downstream flow.

Research suggests that wetland draining and levee construction reduced the storage capacity of Mississippi River floodplains from the equivalent of 60 days worth of river discharge before European settlement to about 12 days of discharge in the late twentieth century, resulting in more frequent and more severe floods (Mitsch and Gosselink 1986).

Coastal wetlands are extremely important for reducing damage from hurricanes and other severe storms. Salt marshes and estuaries absorb much of the energy of storm surges and buffer coastal uplands from the full force of the water.

Wetlands increase the volume of water able to replenish groundwater by holding precipitation and runoff for long periods of time.

Nearly one third of New Hampshire's wildlife species depend on wetlands for all or part of their life cycle.

Aquatic species of invertebrates, fish, amphibians, reptiles, birds, and mammals inhabit permanent wetlands. Terrestrial animals often forage on the abundant food sources in wetlands, including plants, insects, and other prey.

Wetlands provide "stepping stones" across the landscape for small animals that require water and dense cover while seeking food, mates, or nest sites, or when dispersing.

Riverine wetlands that extend along watercourses provide travel corridors for many wildlife species, including wide-ranging animals such as moose, deer, black bear, and bobcat.

Seeps provide important water sources and foraging areas for black bears in spring and early summer (Elowe 1984), and for early spring migrants such as robins and woodcocks.

Seeps and springs provide cool water to nearby streams during hot summer months when water temperature and dissolved oxygen may limit survival of some fish and other aquatic species.

Implementation Strategies

- Avoid dredging and filling of wetlands.
- Use cluster subdivision design to minimize impacts on wetlands.
- Avoid fragmenting wetland clusters with roads and buildings.
- Avoid use of heavy equipment within 50 ft. of a spring or seep.
- Avoid constructing roads or buildings downstream of seeps where they would intercept water flow.
- Maximize undeveloped open space adjacent to wetlands.
- Minimize disturbance of uplands that drain directly into wetland basins.
- Minimize human activities near wetlands that negatively impact water quality, wildlife populations, or wildlife habitat.
- See also implementation strategies for Shorelands and Riparian Areas.
- Maintain safe access for wildlife between wetlands and areas of undeveloped upland habitat.

Definitions

Floodplain forest: forest on low terraces along river banks that are inundated by overflow during periods of high water. Silver maple dominates floodplain forests along New Hampshire's major rivers; floodplain forests along smaller rivers are more diverse, with red maple, black ash, black cherry, and ironwood as major components and hackberry, American elm, eastern cottonwood, boxelder, sycamore, swamp white oak, and river birch sometimes present.

Marsh: wetland dominated by herbaceous (non-woody) vegetation such as cat-tails, grasses, sedges, and rushes.

Peatland: wetland where dead vegetation accumulates in a thick mat because highly acidic conditions inhibit decomposition. Sphagnum moss is characteristic of peatlands; typical vegetation also includes leatherleaf, labrador tea, bog rosemary, pitcher plant, sundew, wild cranberries, and several species of orchids.

Seep: small area where groundwater comes to the surface, saturating the soil for much or all of the growing season. Sensitive fern, skunk cabbage, and jewelweed often grow in seeps.

Spring: location where water flows out of the ground, originating a stream or feeding an existing water body.

Swamp: wetland dominated by woody vegetation. Shrub swamps and red maple swamps are common in New Hampshire.

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