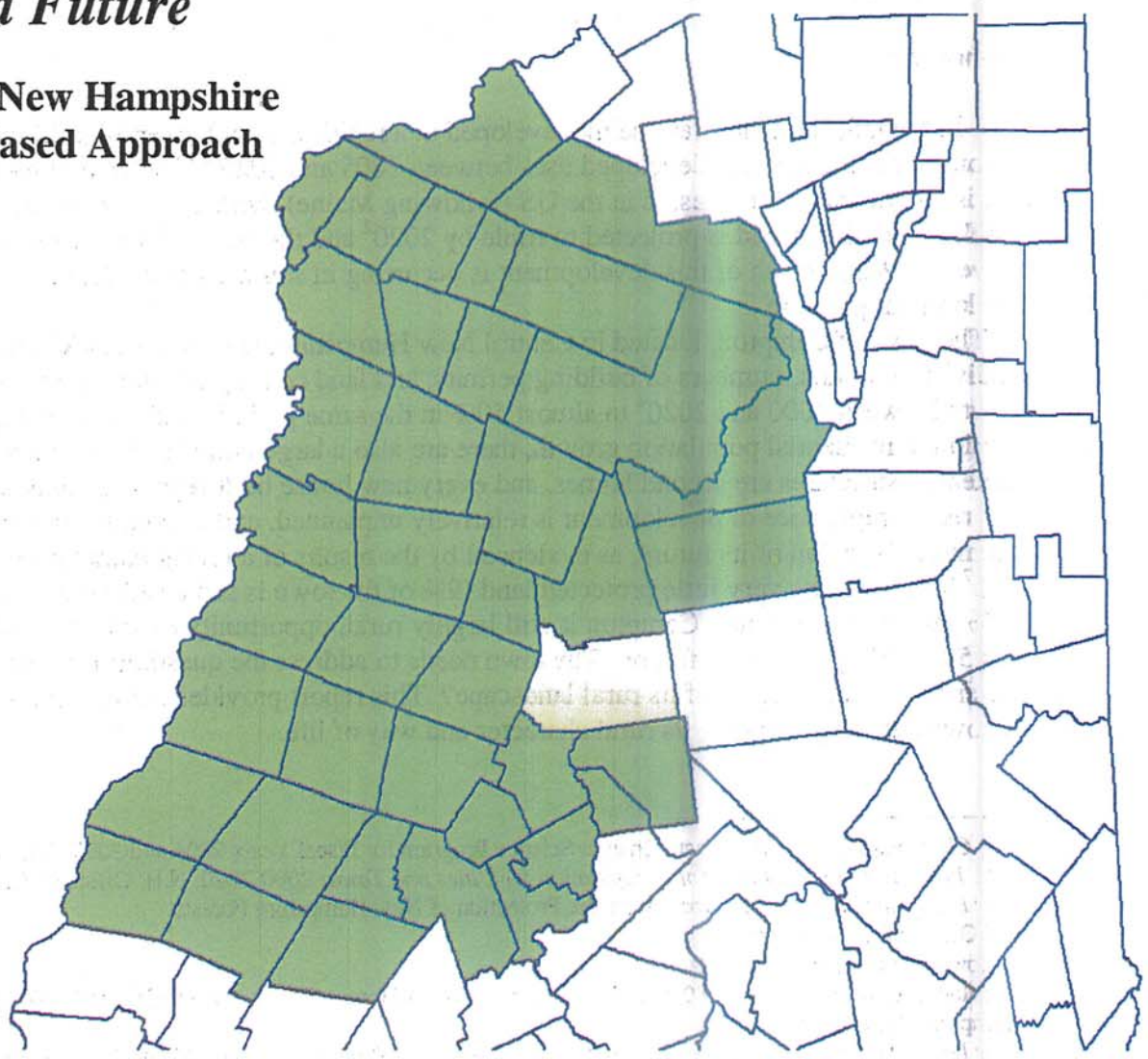
Campton's Past, Present and Future

Planning for the Future of Campton, New Hampshire
A Geographic Information Systems Based Approach

February, 2005



Prepared by:
Stephanie Elson
With Dr. Steven Hamburg
Land Use Land Cover Change Working Group
Brown University
http://porter.geo.brown.edu/planetary/LCLUC_Owens/

PART 1: INTRODUCTION

Foreword

In the US, rural lands are being developed at a rapid rate, with over 70 million acres of rural lands (forests and farmlands) projected to be converted to urban and developed uses between 2005 and 2025.[1] The state of New Hampshire is very vulnerable to this development trend as it is the second most forested in the US (following Maine), with 84% of the state in forest. New Hampshire's population has more than doubled since 1950, and is projected to triple by 2020[2] and the state's forest cover is declining at a rate of 13,000 acres (over 20 square miles) per year.[3] While much of this development is occurring in southern New Hampshire, Central and Northern New Hampshire are also feeling development pressure.

The town of Campton, located in Central New Hampshire, has seen a quickened pace of growth in recent years, including increased subdivision of land, numbers of building permits, and land coming out of current use. Population projections for the town range from 28% growth between 2000 and 2020[4] to almost 50% in the same period,[5] and thus these patterns of land-use change are expected to continue. In addition to residential population growth, there are also a large number of second homes in Campton; in fact, forty percent of the town's residential structures are second homes, and every new house built represents only one and a half permanent residents to the community.[6] This recent rapid pace of development is relatively unplanned, and of concern to many of the town's residents as not being consistent with the community's vision of its future, as evidenced by the results of a recent community survey conducted as part of a redraft of the town's Master Plan.[7] The town has very little protected land (9% of the town is protected from future development) when compared to the statewide average (23% per town).[8] Because Campton is still largely rural, opportunity exists for forethought as to how the community would like the town to look 50 or 100 years in the future. The town needs to address the question: How can Campton plan for development in a way that will conserve the many values of its rural landscape? This report provides the information necessary to initiate a conversation about the options the town has for preserving its rural character and way of life.

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[1] *Our Changing Planet*. US Climate Change Science Program for Fiscal Years 2004 and 2005. Online: www. Usgcrp.gov
[2] *N.H. Population Projections: Total Population for Cities and Towns* 2000-2020, N.H. Office of State Planning, Oct. 1997.
[3] *New Hampshire Everlasting*. Society for the Protection of New Hampshire Forests
[4] NH Office of State Planning
[5] Following current growth trends
[6] Population growth between 1980 and 2000 Census: 1,025. # Homes Built between 1980 and 2000: 698. 1,025/698 = 1.5 new residents for every new home built.
[7] Campton Master Plan.
[8] *New Hampshire's Changing Landscape 2005*, Society for the Protection of New Hampshire Forests. 2005. www.spnhf.org

Using Geographic Information Systems (GIS), a powerful mapping technology, the town can better understand its historical, social, cultural, built, and natural environments. With these data it is possible to view and analyze trends in map form, creating an understanding of the ways in which all of the different components of the community overlap and interact. This report is a GIS-based project funded by the Town of Campton at its spring 2005 annual meeting. With the completion of this report in January, 2006, Campton has the information with which to gain a deeper understanding of the town's physical landscape and development trends. This understanding can be used to inform a discussion of the town's vision of its future, and can help explore how different land-use policies (zoning) can shape what the town will look like in the future. The maps developed as part of this project make the conversation about the town's future available to a much wider cross section of the town's residents, highlighting implications of current patterns of growth, both physically and economically.

This report describes a town with a lot of room to grow; as discussed later in this report, if all land was developed under current zoning, there would be roughly 23,000 homes and 35,000 town residents, compared to the roughly 1,900 homes and 3,000 residents in town today. Even if only half of this growth were to occur, the potential for the town's landscape to change is significant. The idea behind this report is not to stop growth, but to provide the tools for the town to identify and conserve the qualities of the landscape that the town deems important and valuable. This report provides the information needed to make the decisions that can direct growth in keeping with the town's vision. Allowing growth to occur as it currently is proceeding is itself a decision, one that leaves the future of the town largely in the hands of individual landowners, who are increasingly non-residents. This hand-off approach will have impacts on how the town looks and the taxes that are needed to support essential services.

There is no right-answer as to how the town should develop, but it is certain that change will occur. The key question facing the town over the next several decades is whether the town will take responsibility for how these changes occur. The measure of the success of this report lies in whether the town engages in an active conversation among town residents as to what they want the town to look like in the future. We hope that the town feels excited and empowered by the information contained in these pages, and uses these data to be proactive about imagining the Campton of tomorrow. We hope that this report helps town residents to be proud of the town for many years into the future.

Introduction to Campton, NH

The Town of Campton is located in Central New Hampshire's Grafton County, and covers roughly 33,620 acres (~52 sq. miles) on the southern edge of the White Mountains (See *Figure 1).* In 2005, the town is largely forested (85%) and has a rural feel, although at ~55 people per sq. mile (and 67 people per buildable square mile as defined by current zoning),[9] it is classified as 'exurban' rather than 'rural'.[10] This change in characterization occurred roughly in 1985 and represents an important transition for a town that has always thought of itself as rural. Campton is bisected by the Pemigewasset River Valley, which runs north-south through the town's geographic center. The Historical Maps in the appendix detail changes in Campton's population and built environment from 1860 – 1980. Looking this far back into the town's past provides an understanding that changes on the landscape have been occurring for a long time, and encourages us, when planning for the future, to not just think about what the town will look like in 15-20 years from now, but 100 years, or even farther into the future. The town's population peaked in the mid-1800s at 1,500 people, and then declined to a relatively stable population of between 1,000 and 1,200 as agricultural and then manufacturing economic activity expanded and

Figure 2: Campton's Historic Population

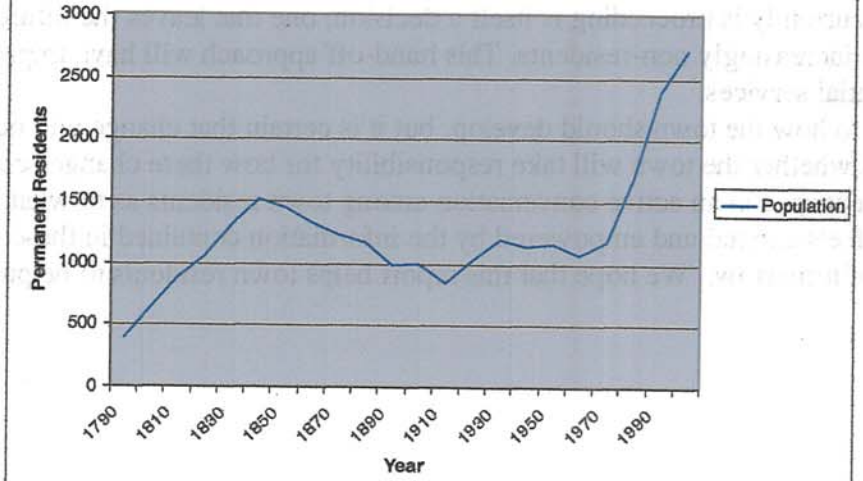
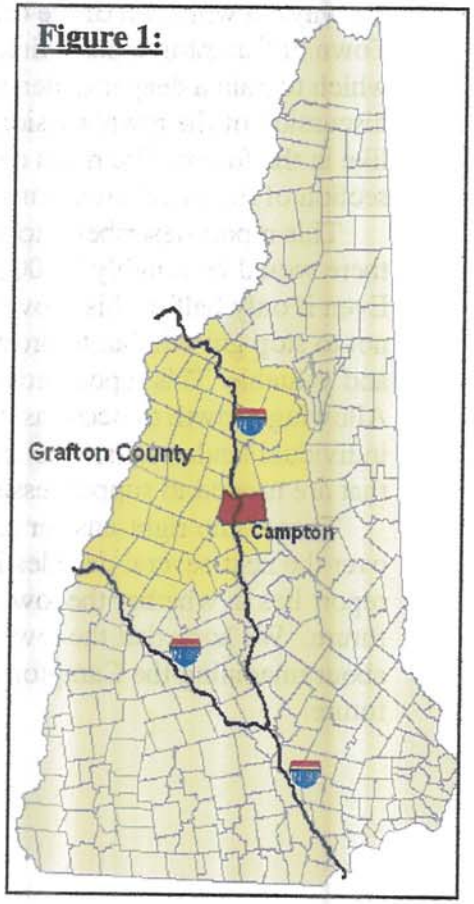


Figure 1:



[9] 2003 population estimate, based on 2000 Census data. Estimate provided by NH Office of Energy and Planning. In 2000, Campton had 52.4 persons per sq. mile.
[10] DM Theobald. "Placing exurban land-use change in a human modification framework." *Frontiers in Ecology and the Environment*, 2004. (Rural: <26 persons/sq.mile; Exurban: 36-144; Suburban: 144-1,000; Urban: > 1,000.)

contracted. The completion of I-93 in 1970 brought rapid growth to Campton, as the highway made the town easily accessible from more urbanized areas in Southern New Hampshire and Massachusetts, bringing both second homeowners and willing commuters. Interstate 93 runs parallel to the river, and has 2 exit/entrance ramps in town. With the development of the highway, the town grew 45% from 1970-1980, from 1,171 to 1,694 residents. By 2003, the US Census Bureau estimated that the town had almost 2,900 permanent residents, or, 55 persons per square mile. (*Figure 2* shows the town's population over the past 200 years).[11] As can be seen in *Figure 3*, the town also has a significant number of seasonal residents; almost 40% of residential and condominium homeowners have an out-of-town primary address. Most of the out-of-town residents live in New England (84%), with the majority of these in Massachusetts and other parts of New Hampshire. *Figure 4* shows the changes occurring on the landscape over the past 20 years; instances of lot subdivision, acres disqualified from current-use, and new homes built.[12] This graph depicts the boom and lag cycles of development; after a period of intense growth in the 1980's, the graphs show the 1990's as a period of adjustment. In the late 1990s another surge occurred as demand rose to meet supply and the boom of development began again. It appears that the current boom might be much bigger than those previously observed.

Figure 3: Breakdown of Campton Homeowners by Primary Residence

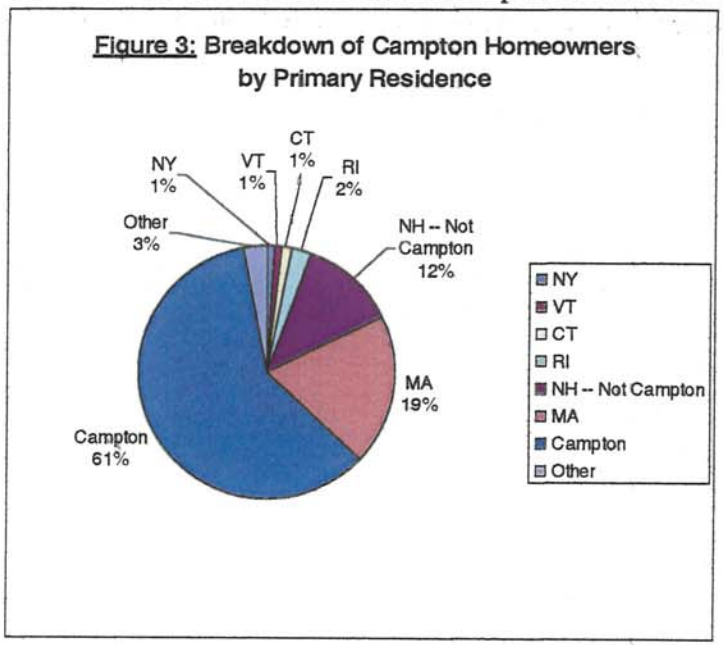
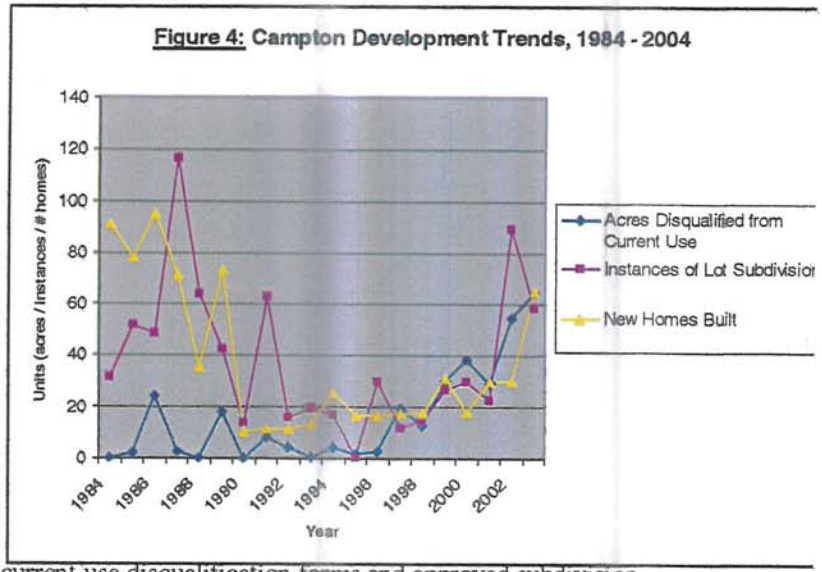


Figure 4: Campton Development Trends, 1984 - 2004



As evidenced in the Master Plan and also in discussions with the town Boards and residents, it is clear that concern exists about managing growth and its potential to impact the rural, forested nature of the town. In the recent re-draft of the town's Master Plan, much concern was shown for preserving Campton's "rural heritage," defined as "the pastoral landscape of past and present farms, our country

[11] US Census data, 1790-2000

[12] This data was collected in the Campton town office from paper files during the summer of 2005. All current-use disqualification forms and approved subdivision applications from 1985 – present were entered into an excel database. Homes built/year was obtained from the town's tax assessment database.

roads with their natural landscape of native trees, shrubs, ferns and flowers, our stonewalls, and the view of the nearby mountains, hills, rivers, streams and ponds."[13] Campton has historically been a town rich in rural character, with scenic views, clean drinking water, forest and agricultural products, and wildlife habitat. The tools to plan for the continued existence of this rural heritage are now in the hands of the town. The challenge is to put them to use.

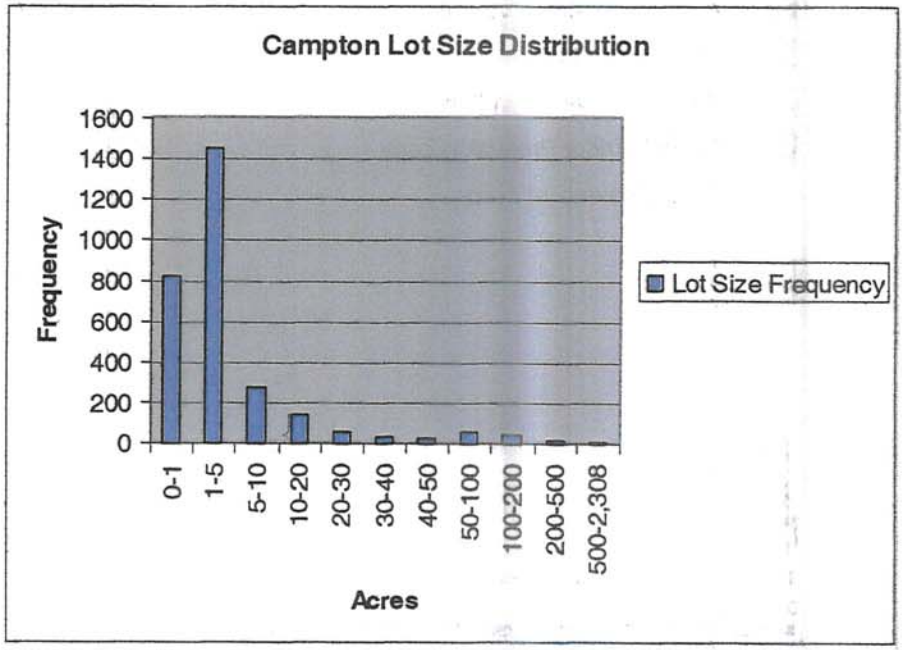
[13] 2003 Master Plan, Town of Campton, NH.

PART 2: A LOOK TOWARD THE FUTURE

This section of the report explores what future development may mean to Campton. First, we will look at the distribution of buildable land under current and alternative zoning scenarios. Then, we will look at different population projections, and what the town can expect in terms of new residents and home development.

Current Zoning

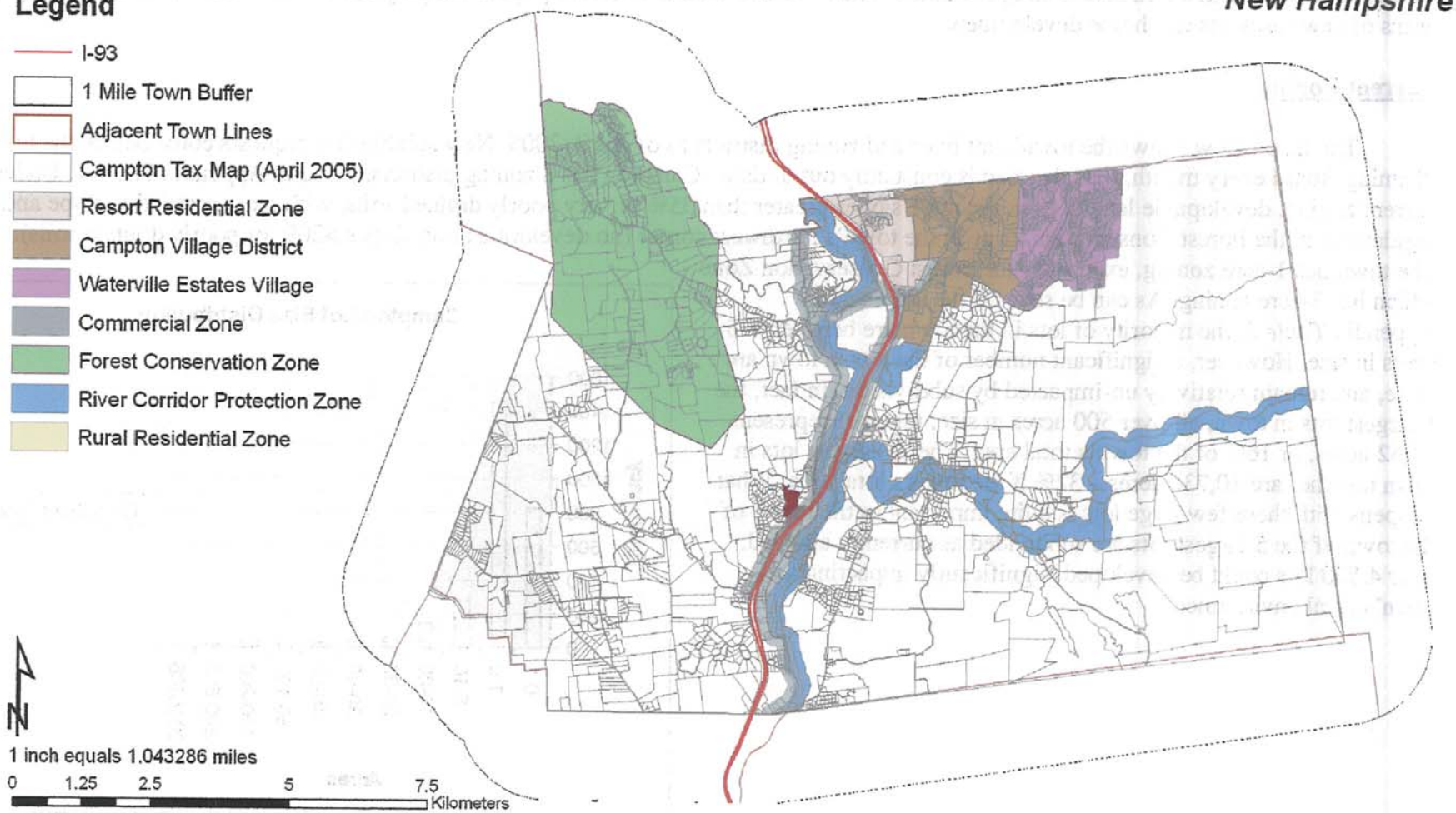
The map below shows the town's lot lines and zoning districts as of April, 2005. New subdivision requests come before the town Planning Board every month, thus the map is constantly out of date. Campton has 8 zoning districts, listed in Appendix *Table 1*. Under current zoning, developable land does not include slopes greater than 35% or very poorly drained soils, with more restrictive slope and soil regulations in the Forest Conservation Zone in the town's northwest corner (no development on slopes >20% or poorly drained soils). The town has 1-acre zoning, except for the Forest Conservation Zone which has 3-acre zoning. As can be seen on the map, and in Appendix *Table 2*, the majority of lots in the town are between 1-5 acres in size. However, a significant number of the lots in town are large, and remain relatively un-impacted by subdivision. In fact, the 5 largest lots in town, all over 500 acres in size, together represent 5,252 acres, or 16% of the town's total area. The 25 largest lots in town together are 10,736 acres – 32% if the town's total area. What happens with these few large lots is quite important to the future of the town; if the 5 largest lots are subdivided as currently allowed, over 4,500 lots could be developed, significantly impacting the town's rural environment.



Zoning Districts

Town of Campton

New Hampshire



Buildable Land

Buildable land, sometimes referred to as Net Useable Land Area, or NULA, is the proportion of land that could be developed under current zoning, minus current public and protected lands. In Appendix *Table 3*, buildable land is calculated under current zoning restrictions as well as under more restrictive hypothetical scenarios. This exercise is illustrative of the buildable-land impact of possible zoning changes; the scenarios selected below were chosen simply to illustrate this approach. The Build-out Map shows buildable land under current regulations, as well as under the hypothetical scenario of a zoning change that applies the restrictions of the Forest Conservation Zone to the entire town.

There are ~27,000 acres of buildable land under current regulations, 1,990 acres in the Forest Conservation Zone, and ~25,000 acres in the rest of town. If 3.7%, or, 74 acres of this is devoted to road rights-of-ways in the Forest Conservation Zone,[14] that leaves ~1,900 buildable acres. At 3-acre zoning, this is 638 lots. Similarly, if 10.3%, or 2,600 acres of total buildable land is devoted to road rights-of-ways in the remainder of town, that leaves 22,655 buildable acres. At 1-acre zoning, this is over 22,000 lots. In sum, current development restrictions permit for ~23,000 lots. To put this in perspective, there are currently about 1,900 dwellings (residential homes and condominiums) in Campton – growing to full capacity would result in over 12 times more homes than are currently present.

Using GIS different regulatory scenarios can be tested and their potential effects better understood. For instance, we can use GIS to see what would happen if regulations were altered to prohibit development on all wetlands and poorly drained soils; this would decrease the amount of buildable land to ~26,000, acres, a 5% decrease from current regulations. Similarly, we can take a look at what would happen if the Forest Conservation Zone slope and poorly drained restrictions were applied to the entire town; we see that this would result in ~20,000 acres of developable land a 28% decrease as compared to current zoning. If the lot size criteria of the forest conservation zone were applied to the entire town it would reduce the buildable acreage to just under 19,000 acres, and allow for the development of ~ 6,000 3-acre lots. The map below shows spatially where the decrease in buildable acreage would occur under this hypothetical scenario. Using GIS, it is possible to examine changes in developable land under different regulatory scenarios in many different ways. Which lots would be most affected by a regulatory change? What zoning changes would best protect highly visible areas, or high value wildlife habitat areas? The town can use GIS to model different scenarios and ask and answer these, and many other questions. The analysis included as part of this report is meant to be

[14] This was calculated by determining the percentage of developable land that must be allocated for road rights-of-way for each lot. 200 feet of required frontage, multiplied by 25 feet (1/2 the width of the road right-of-way) = 5,000 sq. feet. 5,000 sq. feet added to 43560 feet (minimum lot size) = 48,560 required area per lot (135,680 in the forest conservation zone). Therefore, the portion of developable land that will be dedicated to road rights-of-way is 5,000 sq. feet / 48560 sq. feet * 100 = 10.3% (or 5,000 sq. feet / 135,680 sq. feet * 100 = 3.7% in the FC zone).

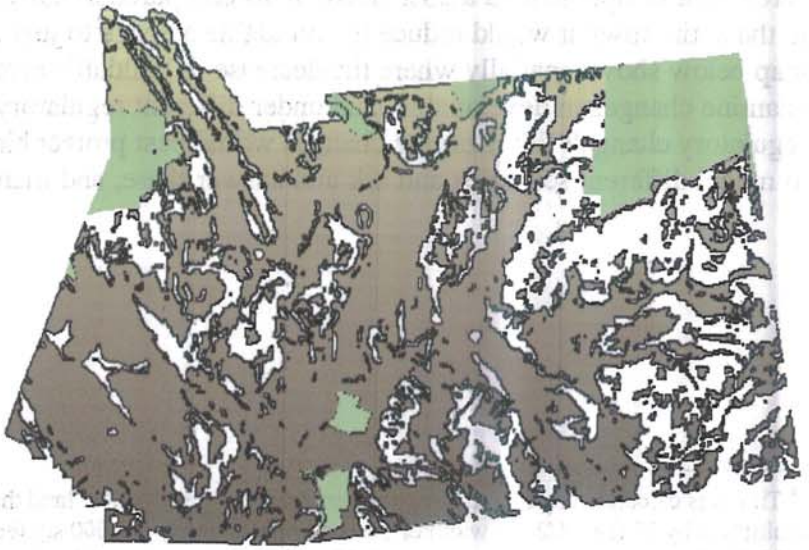
just the beginning of a deeper exploration.

Net Useable Land Area Under Alternative Regulatory Scenarios
Town of Campton
New Hampshire

Buildable Land Under Current Regulations

Restrictions: 20% slopes and poorly drained soils in the Forest Conservation Zone, 35% slopes and very poorly drained soils everywhere else in town.

Buildable Acres: 27,247
Total Potential Lots: 23,293
Total Potential Residents: 32,939



Buildable Land if Forest Conservation Zone Regulations were Applied Townwide

Restrictions: 20% slopes and poorly drained soils

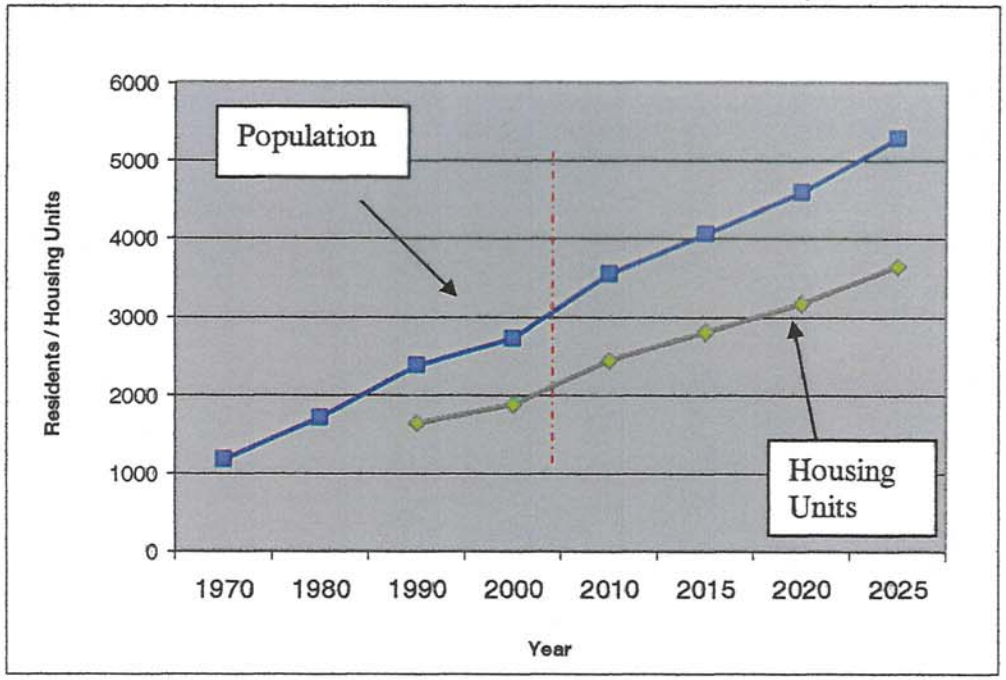
Buildable Acres: 19,703
Total Potential Lots: 17,350
(keeping 1 acre zoning except in the FC Zone)
Total Potential Residents: 26,025

Population Projections & Housing Implications

We can estimate how many new residents additional lots might bring to town by looking at patterns of development during the past 10 years. *Appendix Table 4* outlines the development of a population multiplier. Applying this tool, we can calculate that 23,000 new housing units would mean 34,500 new year-round residents for the town. In contrast, there were 2,719 permanent residents of Campton in the 2000 census.

Under current zoning, the town might have as many as 34,500 additional residents. However, it is clear that such growth will not will not happen anytime soon. But the town is growing, and there is every reason to believe it will continue to do so for the indefinite future. There are several different ways to project population growth for the town. A conservative estimate of growth comes from the NH Office of Energy and Planning, and estimate on the other end of the spectrum comes from taking the rate of growth in the town from 1980 – 2000 and projecting it forward. Appendix *Table 5* shows these different population projections, and how they translate into projected new housing units using the population multiplier discussed above. In sum, current zoning allows for extensive change to occur, and of a scale that will diminish Campton's rural landscape. While the town will not experience full build-out in the foreseeable future, population projections call for a 32-95% increase in the number of homes in town in the next 20 years.

Population Projections using the growth rate of the last 30 years



Part 2 Conclusion

The information contained in this report is meant to inspire discussions and decisions that proactively shape the future of the landscape to reflect the town's needs and desires. As the town experiences projected development, should there be more building on ridgelines or less building on ridgelines? Should development be allowed to occur unrestricted in highly visible areas, or should there be regulations that limit the impact of development on the town's most scenic views? The data contained in this report can help the town have this and similar discussions, and can help Campton conserve what is valuable to the town while allowing planned growth to occur. A few specific suggestions are offered throughout the report, based solely on analytic findings (the primary author of this report has no agenda in terms of shaping the future of the town). Some of these suggestions take into consideration values presented in the recent redraft of the town's Master Plan, and reinforced by conversations with the town Boards and town residents.

Campton is a beautiful and unique town. Its historic bridges and schools, striking forested views, quiet scenic roadways, and friendly and welcoming population will continue to attract new residents. Trusting the town to use the tools presented in this report to plan for growth in a way that keeps the fabric of the town intact, we look forward to the Campton of tomorrow.

PART 3: GIS ANALYSES AND MAPS

This section of the report maps and describes Campton's natural resources and built environment, examining the current land-use / natural resource relationship. This section ends with a natural resources co-occurrence analysis, mapping the areas in town that are rich in natural resource values and exploring how the current distribution of lots and the current zoning districts interact with these identified high-value regions. The town can use the spatially explicit data presented in Part 2 to understand how different policy decisions may impact the town. Each analysis is supported by associated tables and graphs in the appendix of this report. The maps / analyses included as part of this section are:

1) Base Map _____ *Page 15*

2) Scenic Resources _____ *Page 17*

3) Unfragmented Lands _____ *Page 19*

4) Wildlife Habitat _____ *Page 23*

5) Water Resources _____ *Page 26-27*

6) Lots in Current Use _____ *Page 29*

7) Natural Resource Co-occurrence Maps _____ *Page 31-34*

   i. Natural Resource Co-Occurrence _____ *Page 31*

   ii. High Value Co-Occurrence _____ *Page 31*

   iii. Regulatory Scenarios Impact on High Value Areas _____ *Page 31*

   iv. Tax Map / Natural Resource Co-Occurrence Analysis _____ *Page 31*

Base Map

The Base Map introduces us to the town of Campton, and highlights the town's landcover and dominant attributes. The map shows that the town is largely undeveloped, with about 85% of its total area in forest (28,483 acres of forest land). The town is situated at the junction of 6 sub-watersheds that all drain into the Pemigewasset River, and are thus part of the larger Pemigewasset Watershed; these sub-watersheds are the Mad River, Beebe River, Squam Lake Drainage, Lower Baker River, Campton Tributaries, and West Branch Brook Watersheds, and in this report are referred to together as 'Campton's watershed'. As can be seen on the map, Campton's watershed is also largely undeveloped, with 83% of land in forest. There is very little agriculture in the town; agricultural fields cover about 1,034 acres, or 3% of the town. The watershed mirrors this statistic, and is 2% agricultural. Developed lands (built-up areas, such as those occupied by structures and roads) are also a small fraction of the town and surrounding watershed at 1,075 acres, or 3% of the town's area, and 3,589 acres or 3% of the watershed. (See *Table 6* in the Appendix for more detail on Campton's land cover types).

This map also displays Campton's protected areas. These include public lands, designated common areas in subdivisions, and land protected through conservation easements. Campton has a relatively small percentage of conserved lands (11% protected) in comparison to other New Hampshire towns, as the statewide average is 23% protected.[15] (See Appendix *Table 7* for more detail on Campton's public and protected areas).[16]

Finally, the map shows point locations of some of the town's sites of historical significance. These sites were selected by the Campton Historical Society, and digitized as part of this project. Appendix *Table 8* lists these sites.

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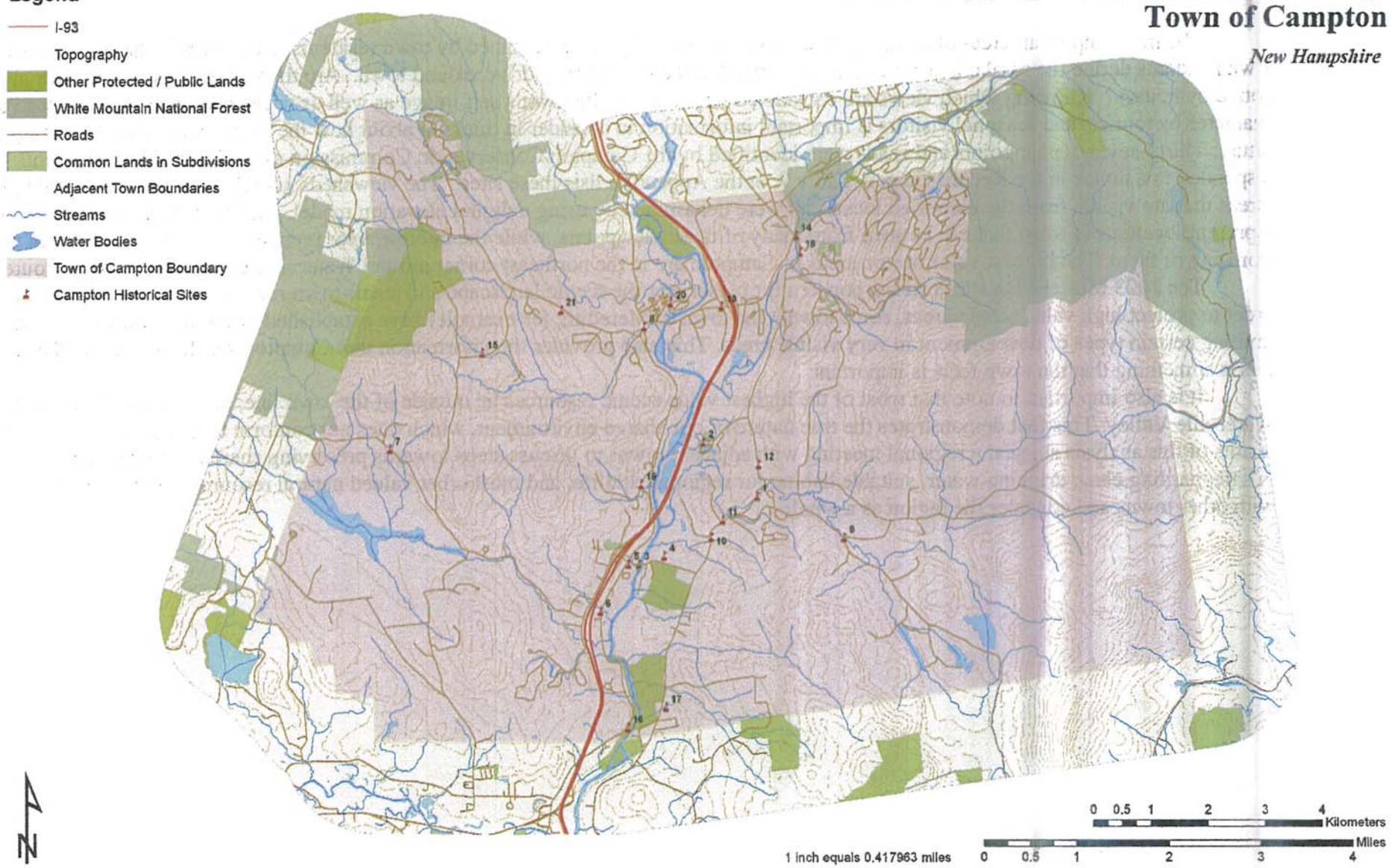
[15] Statewide averages generated from *New Hampshire's Changing Landscape*, Society for the Protection of New Hampshire's Forests. 2005.

[16] It is important to note that it is unclear if the representation of the number of designated common areas in subdivisions is comprehensive, or if these lands have easements and are on town records as protected open space.

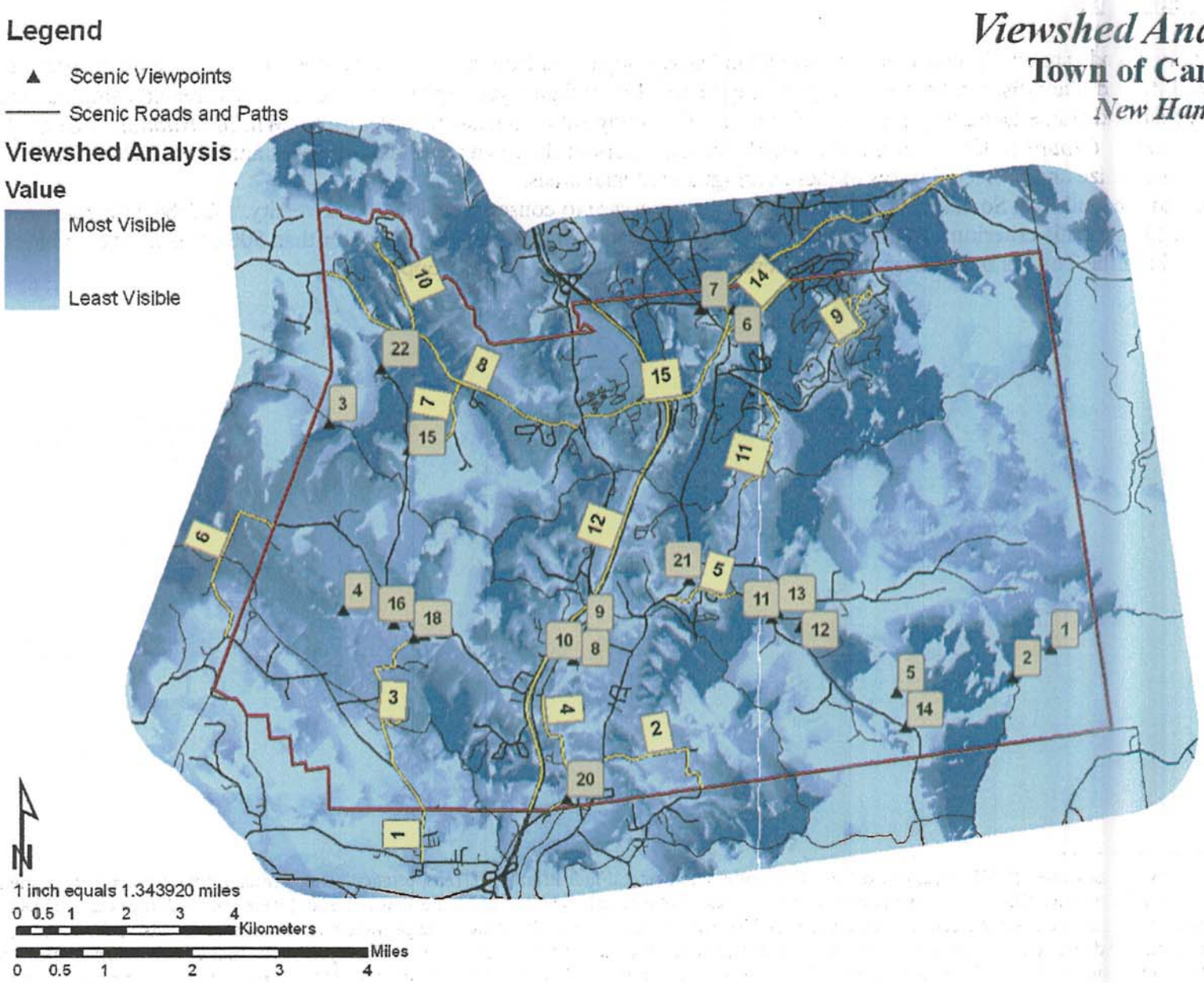

Legend
I-93
Topography
Other Protected / Public Lands
White Mountain National Forest
Roads
Common Lands in Subdivisions
Adjacent Town Boundaries
Streams
Water Bodies
Town of Campton Boundary
Campton Historical Sites
Base Map
Town of Campton
New Hampshire
N
1 inch equals 0.417963 miles
0 0.5 1 2 3 4
Kilometers
Miles
0 0.5 1 2 3 4

Scenic Resources Map (Viewshed Analysis)

The most important areas of town in terms of visual aesthetics, as determined by town residents, are shown in the map below. Many town residents define the rural character of the town by what they see as they drive around town. Are the forested vistas intact, or are they dotted by houses? Knowing which views are considered important to the town's self image as well as to the perception of Campton's rural character by tourists and seasonal visitors is important information to consider in thinking about how the town would like to develop in the future. Thirty-seven scenic points and roads were identified by the Campton Conservation Commission as well as by town residents that responded to a notice in the Record Citizen. *Table 9*, in the Appendix, lists these sites. The viewsheds associated with these scenic places (areas that are visible from the identified locations) were determined by using a digital elevation model. On the map, the darkest areas represent locations in town that can be seen from many of these viewpoints, while the lightest areas represent locations that are not visible from any of them. The highest value scenic areas in Campton are in the northeast corner around Waterville Estates, and east of Route 175.

The 2003 Master Plan states strong concern for preserving the scenic landscape and small-town rural appearance of Campton. In order to protect high value scenic areas, some towns (the town of Meredith, for example) have established 'viewshed protection districts' limiting certain types of development in very visible areas. This map provides the information that Campton would need to do the same, if this is something that the town feels is important.

It is also important to note that most of the highest value scenic resources lie outside of the town line, in Thornton, Ellsworth and Waterville Valley. This fact demonstrates the true nature of our shared environment, which does not conform to geo-political boundaries. The results of this analysis suggest a regional meeting with adjacent towns to discuss steps towards preserving shared valuable viewsheds. Just as in safeguarding clean drinking water, suitable habitat for regional wildlife, and most other valued natural resources, it is important to work with other towns and consider the region as a whole.


Legend
Scenic Viewpoints
Scenic Roads and Paths
Viewshed Analysis
Value
Most Visible
Least Visible
Viewshed Analysis
Town of Campton
New Hampshire
1 inch equals 1.343920 miles
0 0.5 1 2 3 4
Kilometers
Miles
0 0.5 1 2 3 4

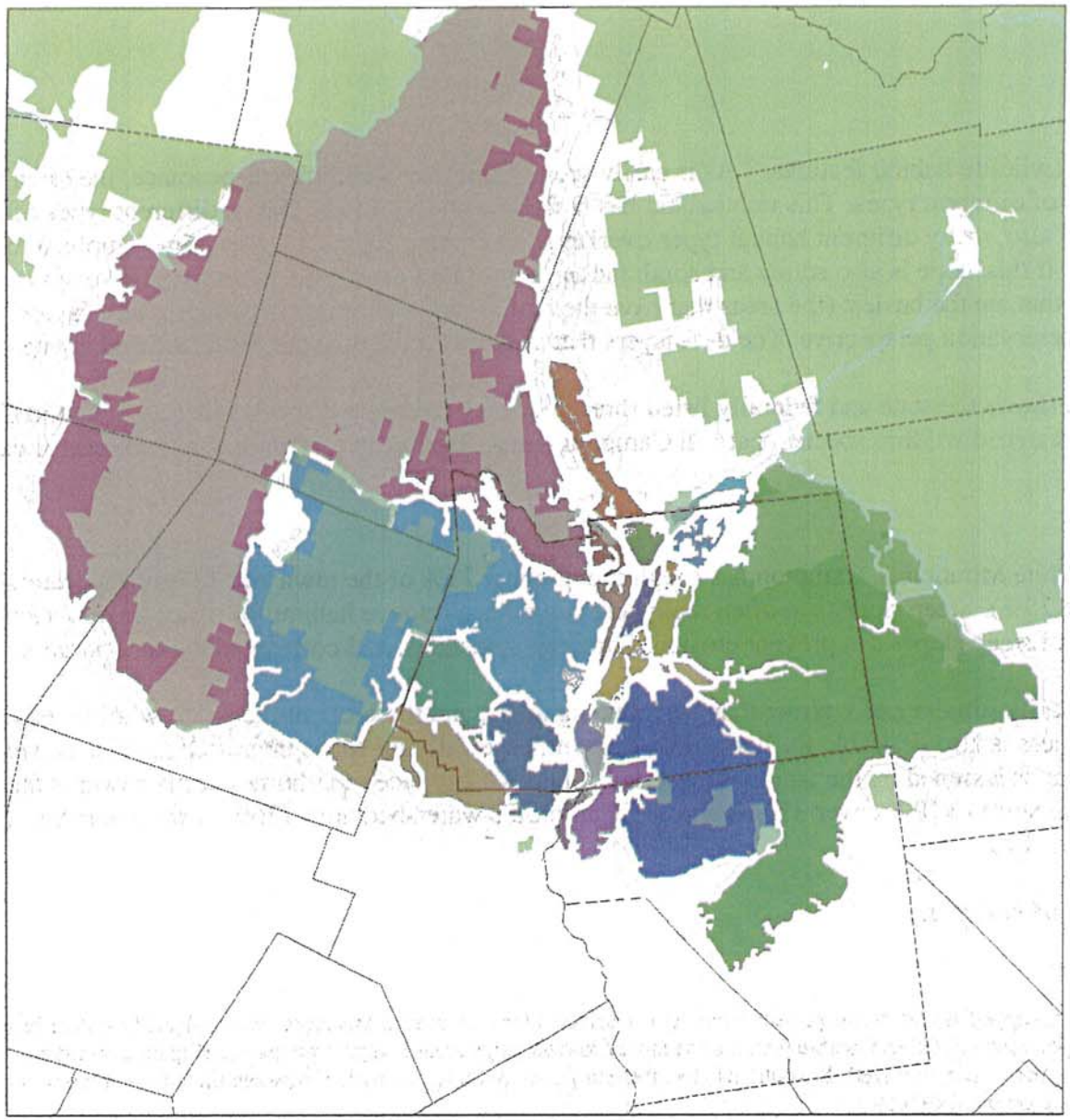
Unfragmented Lands Map

Unfragmented lands are contiguous areas of natural land cover, separated from each other by areas of human development that may interfere with wildlife and plant dispersal patterns. The Unfragmented Lands data layer depicted on the map was created using methodology published by NH Fish and Game Department, in *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups* (2001).[17] Unfragmented blocks that intersect the town were identified and analyzed. *Table 10* in the attached Appendix describes the size and protected status of these unfragmented land areas.

According to the Audubon Society, parcels >250 acres are necessary to conserve regional biodiversity.[18] Of the 25 blocks that intersect the town, 13 meet this criterion. Additionally, 8 are over 1,000 acres in size, and 9 are greater than 500 acres in size. 6 blocks have over 1,000 acres within the Town's boundaries – this represents a significant conservation opportunity.

[17] First, all NH Land Cover Assessment (2001) areas classed as "Residential/Commercial/Industrial" or "Transportation" were erased from Campton's watershed area. Next, NHDOT roads data (Legislative Classes I-V, excluding Class VI— roads not regularly maintained by the Town or State) were buffered three hundred feet and removed from the area. Three hundred feet is a distance determined by NH Fish and Game to be the distance large enough to encapsulate effects of development. Water features that exceed ¼ mile wide and that are not surrounded by natural land cover were also erased from the area. Finally, any remaining areas of developed land cover missed by this analysis, identified on the 2005 Tax Map as lots<5 acres, were also removed. Unfragmented blocks of land that intersect the town boundary were isolated.

[18] Conserving Wildlife, Maine Audubon Society, Spring 2000



Unfragmented Lands
Town of Campton
New Hampshire

Legend

Public and Protected Lands

Unfragmented Land Blocks that Intersect Campton

Area Rank (1 is largest)

1	12	23
2	13	24
3	14	25
4	15	
5	16	
6	17	
7	18	
8	19	
9	20	
10	21	
11	22	

N

1 inch equals 1.025736 miles

0 2 4 8 12 16 Kilometers

0 1.25 2.5 5 7.5 10 Miles

Wildlife Habitat Map

This map shows *some of* Campton's wildlife habitat features.[19] As is easily seen by the map's complex appearance, the town has many characteristics that are attractive to wildlife of different types. This rich habitat has both breadth and depth; that is, different types of habitat occur throughout the town's landscape, and also, many different habitat types overlap and complement each other. For example, a rocky, steep slope is attractive habitat to a Bobcat. If this slope is also sunny and south facing, it becomes even more attractive, and even more likely to draw this rare cat. On the map, the areas that are the busiest (the areas that have the highest co-occurrence of different data layers) can be understood as high-value from a wildlife preservation perspective. The data layers that you see on the map are explained and interpreted below.

Table 11, in the attached Appendix, shows the state and federally listed threatened and endangered species that are found in Campton. These species, along with the many non-threatened wildlife species that call Campton home, depend on certain habitat features for existence.

Steep and South-facing Slopes:[20]

Situated at the edge of the White Mountains, Campton has rough topography; 23% of the town and 27% of the watershed have steep slopes (defined as greater than 25%). Steep slopes are often rocky and can offer attractive habitat for many species such as Bobcat and Porcupine.[21] Protection of steep slopes can prevent erosion, flooding, landslides, and corresponding deterioration of water quality and aquatic habitats.

South-facing slopes are generally sunnier and warmer than surrounding areas, and therefore attractive to wildlife, especially in colder months. Their relative brightness is also desirable for home development, especially for those interested in solar power. In Campton, some of this conflicting use is lessened by the fact that most developers look to face their homes north, towards the scenic views of the mountains. South-facing slopes >10% cover 37,800 acres of Campton's watershed area, (26% of the watershed), and 8,300 acres of the town (25% of the town).

Riparian Areas / Unfragmented Riparian Areas:

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[19] There are many other habitat features that were not mapped as part of this project. The features selected for inclusion in this report were selected for their broad appeal to many species, and their relative ease of spatial representation. Other possible features to map are known ledge areas and pass points and ridgeline corridors (topographic low-points on ridges where wildlife are more likely to travel). It would also be interesting and useful to distinguish between the different types of open habitat that in this report are grouped together into one general category.

[20] Slope data was derived from a DEM of northern New England produced by the US Geological Survey, and acquired through GRANIT at UNH.

[21] SPNHF, Chichester NRI

Riparian areas are the transition zones between land and water, and the areas adjacent to water bodies that are prone to flooding. Riparian areas are important to the health of aquatic ecosystems as they can prevent erosion, filter pollutants from land runoff to prevent the contamination of the water, and are also important wildlife habitat. Riparian lands tend to be disproportionately subjected to disturbance, due to water diversion, stream channelization and recreational and residential development. This may be especially so in Campton, as the town's most easily buildable areas (well-drained soils, moderate slopes), as well as the town's Commercial Zone closely follow the Pemigewasset River. Riparian areas are widely recognized for their ecological importance; the Bureau of Land Management follows four principles in the management of riparian lands: (1) avoiding adverse impacts on riparian areas when possible; (2) avoiding new construction in riparian areas where a practical alternative is available; (3) preserving and enhancing riparian sites and regulating those uses causing irreparable damage; and (4) minimizing actions causing definable adverse impacts.[22] In Campton, there are 3,296 acres of riparian habitat. Of this, 2,368, or, ~70% lie in unfragmented lands (In Campton's surrounding watershed, there are 16,300 acres of riparian habitat, ~75% of which lie in unfragmented lands). Consistent with New Hampshire Department of Fish and Game methodology, this layer was created by placing a 300' buffer around perennial streams, rivers, and bodies of water.[23]

Open Habitat:

The open habitat layer depicts all agricultural lands, pastures, meadows, and other disturbed or cleared lands. This layer was created by combining all areas designated as agricultural, disturbed, or cleared/other open areas in the 2001 New Hampshire Land Cover Assessment published in 2002.[24] The open lands mapped as part of this project are highly variable – for example, the mapped lands include open gravel pits and quarries, as well as right-of-ways, golf courses, clear-cut lands, and many other forms of open habitat. To distinguish the specific type of open habitat present in a given location, one could use aerial photography.

Open lands are the most quickly diminishing habitat type in New Hampshire, currently representing less than 4% of New Hampshire's land cover.[25] In Campton 9,300 acres, or, 6.5% of the watershed are open lands.

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[22] Knopf, Fritz L. et al. "Conservation of Riparian Ecosystems in the United States." *Wilson Bulletin*, 100(2), 1988, pp. 272-284.

[23] Kanter, John; Rebecca Suomala and Ellen Snyder. *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups*. Non-game and Endangered Wildlife Program of the New Hampshire Fish and Game Department. Concord, NH, 2001.

[24] Complex Systems Research Center, University of New Hampshire. January, 2002

[25] SPNHF, Chichester NRI

Deer Yards:

Deer yards are areas where deer herds spend the winter months, finding refuge from high winds and cold temperatures. These areas generally have many large softwood trees and a lot of leaf litter for forage. Deer yards throughout the state were mapped by New Hampshire Fish and Game Department's Wildlife Division from ground surveys and interpretation of aerial photography. The layer shown on the map is a digitization of the paper maps created by the Wildlife Division. There are 91 deer yards in Campton's watershed, 14,770 acres in total. Eighteen of these deer yards, (~4,400 acres), are within town bounds. Approximately 87% of the deer yards in Campton are on unfragmented land.

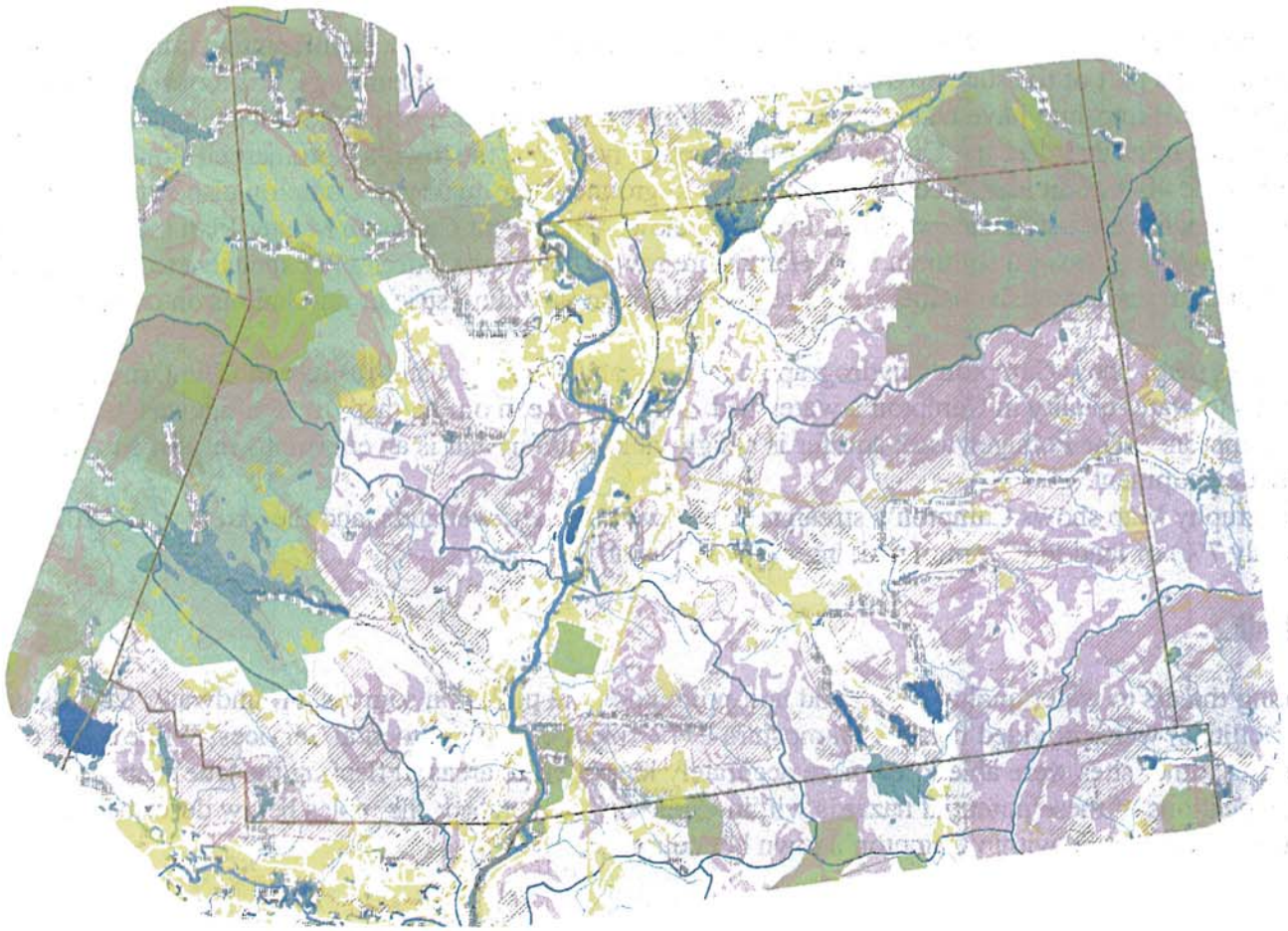
Wetlands:

As defined by the US Fish and Wildlife Service, wetlands are "lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water."[26] There are 1079 acres of wetlands in Campton, 70% of which are palustrine, 22% of which are riverine, and 8% of which are lacustrine. Only 4% of this (44 acres) lie in public/protected lands. There are 11,200 acres of wetlands in Campton's watershed, and only 600 acres of this total lie in public/protected lands. The wetlands data depicted on the map were created by the U.S. Fish & Wildlife Service as part of the National Wetlands Inventory, July 2001.

Inactive/ Abandoned Quarries and Gravel Pits:

While under state law abandoned gravel pits must be restored to their former habitat, this has not happened in many instances. These abandoned pits are often important nesting habitat for reptiles, and important breeding habitat for amphibians due to the presence of open soils and sands, and pools of water. This data was collected by the NH DES as part of an effort to map all Point and Non-Point Pollution Sources. It was last revised in 1995; all sites should be field checked before used as part of any decision-making process. Each site is shown on the map as a point feature, so the shape and extent of the site is not represented. As of 1995, there were eight of these features in Campton's watershed area; five of these are in Thornton, two are in Plymouth, and one is in Campton on Owl Street

[26] Cowardin, L.M., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish Wildlife Service.



Wildlife Habitat
Town of Campton
New Hampshire

Legend

- Open Habitat
- Deer Yards
- National Wetlands Inventory
- WMNF Proclaimation Boundary
- Unfragmented Riparian Areas

Rivers and Streams

Stream Type

- Artificial Path
- Intermittent Stream
- Other
- River/Stream

Conservation/Public Land

- WMNF
- Other Public/Protected

Lakes and Ponds

Waterbody Type

- Lake/Pond
- Reservoir
- River/Stream
- Unfragmented Lands
- Inactive Gravel Pits
- Southfacing Slopes > 10%

Steep Slopes

- >25%

1 inch equals 0.533026 miles

0 1 2 4 6 8 Kilometers

Miles 0 0.5 1 2 3 4

Water Resources Maps

In Southern New Hampshire, the Southern NH Planning Commission (SNHPC) focuses a significant amount of energy on water quality and quantity, as towns in this part of the state are facing increasingly intense water problems as a result of rapid population growth and development. Many towns in New Hampshire have taken steps to protect their groundwater resources, such as implementing groundwater or aquifer protection regulations as part of their Zoning Ordinance. In Campton, however, the town's Commercial Zone lies directly on top of the aquifer – this leads to 37 of the 40 current identified potential threats to groundwater quality in Campton also situated directly over the aquifer. These threats to water quality are listed and explained in detail below. The recent Campton Master Plan mentioned this problem, and noted that groundwater contamination in several southern New Hampshire towns have been extremely expensive to clean up. Campton needs to address this potentially hazardous and expensive issue; there are several option including stricter regulations on commercial operations on top of the aquifer.

The two water resources maps show Campton's hydrographic features and drinking water resources. The Drinking Water Resources Map explores potential threats to water quality in Campton's watershed. As can be seen on the map, the Pemigewasset stratified drift aquifer runs through the center of Campton.[27] The Pemigewasset aquifer is a high-yield aquifer, and is an enormous resource to the town, especially as the town considers future development.

The Campton Hydrography Map shows Campton's streams, rivers, waterbodies, wetlands, and the extent of the 100-year floodplain. There are 2,485 acres (roughly 7%) of land in Campton residing in the 100-year floodplain.

Threats to Groundwater Quality

All layers representing threats to water quality (point and non-point potential pollution sources, groundwater hazards, and underground storage tank facilities) were provided by New Hampshire Department of Environmental Services. While some of these sites were recorded as point features, other sites were able to be more accurately identified as areas, reflecting the true shape and extent of the feature. The map shows the locations of these potential hazards within Campton's watershed; the tables below describe the locations and attributes of the subset of these sites that lie within Campton's town boundary.

[27] An aquifer is a geologic formation that can transmit significant quantities of water to wells and springs. Any rock formation that is relatively permeable and able to transmit water, that is filled to capacity with water and that is adjacent to less permeable material is considered an aquifer. "Aquifer Protection Ordinances." Southern New Hampshire Planning Commission, 2005. Online: http://www.snhpc.org/Water.html.

Groundwater Hazards:

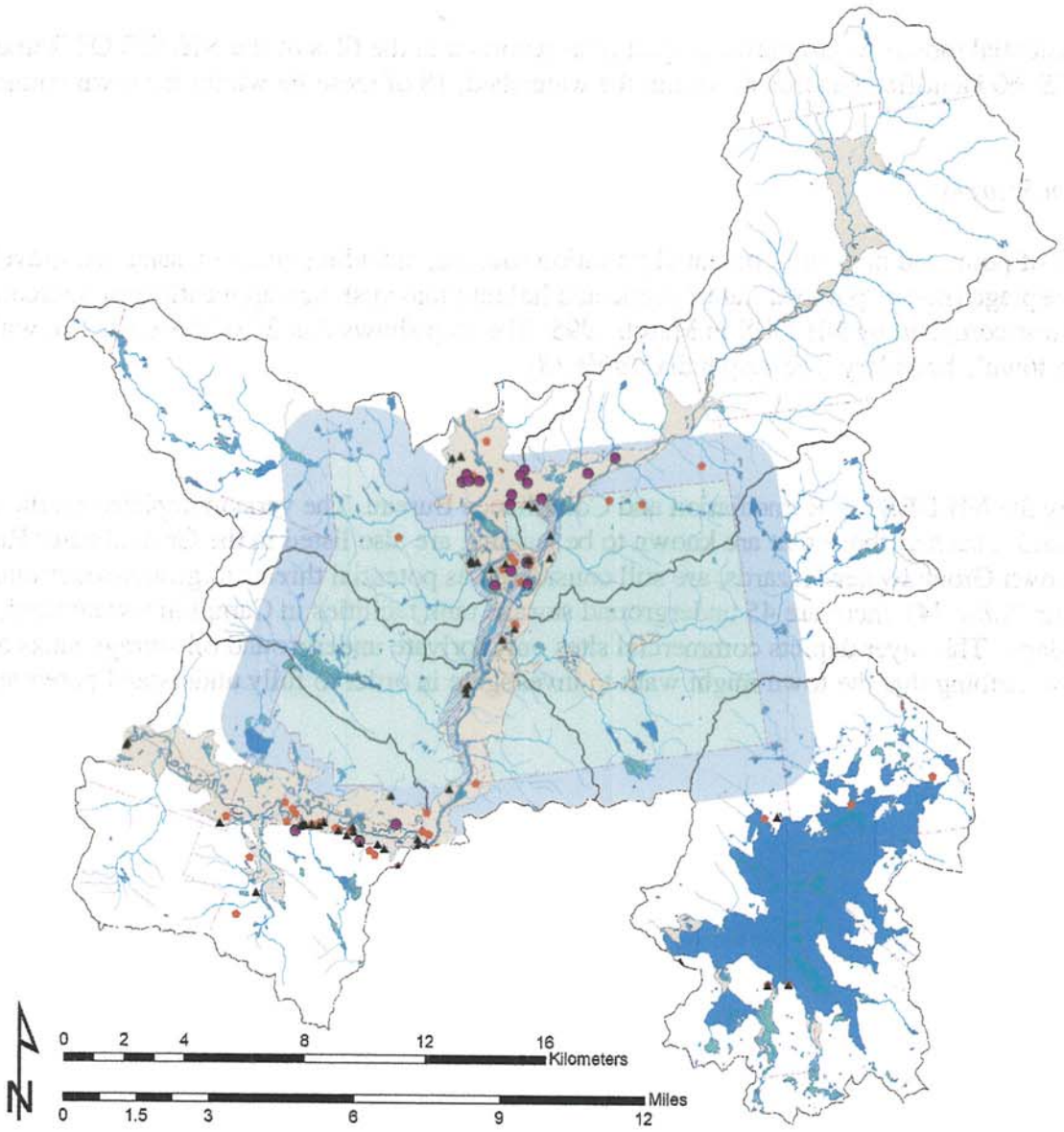
This layer shows existing and potential threats to groundwater quality as recorded in the files of the NHDES Oil Remediation and Compliance Bureau, as of June 2005. 60 identified hazards lie within the watershed, 18 of these lie within the town boundary (see Appendix *Table 12*).

Point and Non-Point Potential Pollution Sources:

This layer depicts selected types of point and non-point potential pollution sources, including quarries, sand and gravel operations, sand and salt storage piles, septage (matter pumped out of septic and holding tanks)/sludge application/lagoon/composting sites, snow dumps and storm drains. It was compiled by NH DES in March 1995. The map shows that 21 of these sites lie within the watershed, and 5 of these are within the town's boundary (see Appendix *Table 13*).

Underground Storage Tank Facilities

This layer is updated monthly by the NH DES Oil Remediation and Compliance Bureau. The version depicted on the map is current as of June 2005. Some storage tanks, such as those that are known to be leaking, are also listed in the Groundwater Hazards layer. Other storage tanks, while not known Groundwater Hazards, are still considered as potential threats to groundwater quality. As can be seen on the map (and in Appendix *Table 14*), there are 45 underground storage tank facilities in Campton's watershed, with 17 of these falling within the town's boundary. This layer depicts commercial sites only; private underground oil storage tanks are not known. The location of private sites is something that the town might want to investigate in order to fully understand potential hazards to Campton's groundwater.



Drinking Water Resources

Town of Campton

New Hampshire

Legend

- Underground Storage Tank Facilities
- Point and Non-Point Potential Pollution Sources (points)
- NPDES Outfalls
- Groundwater Hazards

Streams

- Artificial Path
- Intermittent Stream
- Other
- River/Stream

- Point and Non-Point Potential Pollution Sources (polygons)
- Groundwater Hazards

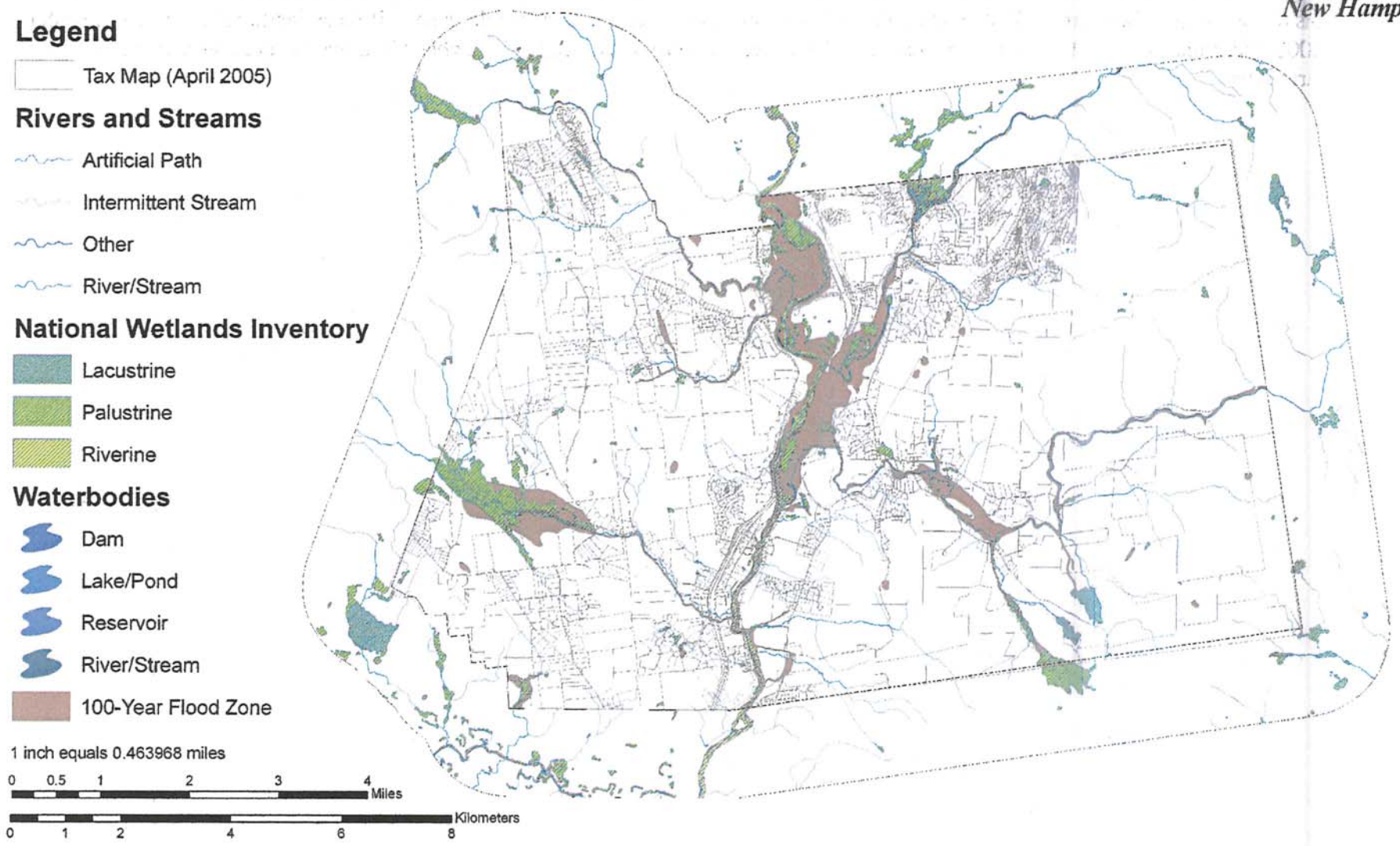
Waterbodies

- Dam
- Lake/Pond
- Other
- Reservoir
- River/Stream

- Commercial Zone
- National Wetlands Inventory
- Aquifer
- Watershed Boundaries
- Town of Campton

1 inch equals 1.042861 miles

Campton's Hydrographic Features
Town of Campton
New Hampshire



Current Use Analysis

This map shows the extent of lands in current use. Currently, only12% of the lots in town are registered under the Current Use program, but represent ~60% of the total land in town. As can be seen on the map, most of the land eligible to be in current use does receive this designation. There are 110 lots that could register for current use, but have not done so.[28] If these landowners were to register their land, 5,000 additional acres of land would be added to the current use program. Appendix *Table 15* shows the number and acreage of lots in current use.

[28] This was calculated by selecting all lots not registered under current use that are greater than 11 acres in size (1 acre for a house plus 10 current use acres).

Current Use Analysis
Town of Campton
New Hampshire

Legend

- Public and Protected Lands
- Not in Current Use
- In Current Use

N

1 inch equals 1.327222 miles

0 0.5 1 2 3 4 Miles

0 0.5 1 2 3 4 Kilometers

Natural Resource Co-Occurrence Analysis Maps

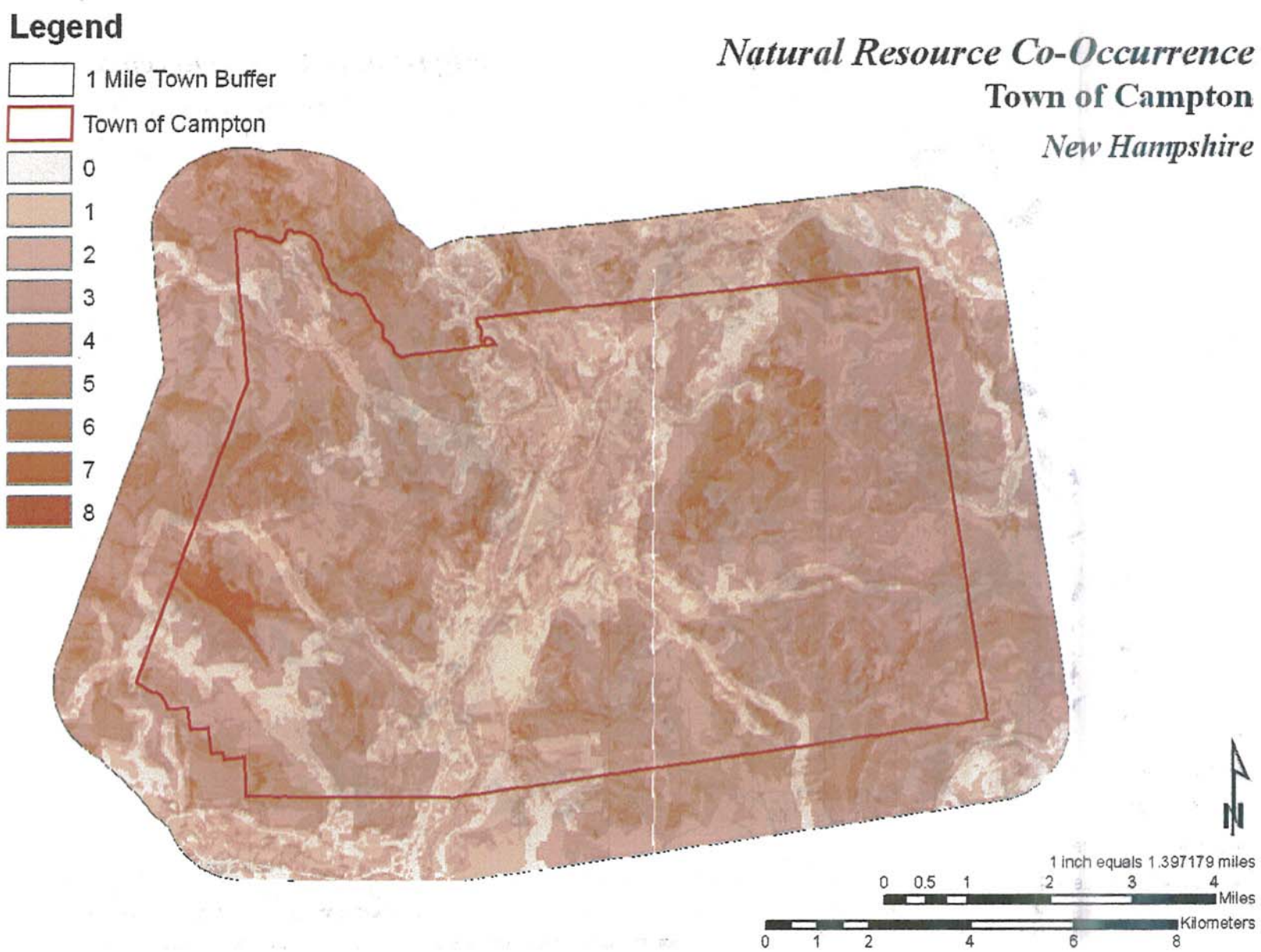
The data presented in this section of the report was brought together in a co-occurrence analysis. In this part of the study, mapped natural resource data layers are 'rasterized' (turned from polygon, or vector, files into pixel format) and superimposed on top of each other in order to gain an understanding of how the different data sets overlap and interact. The natural resource co-occurrence maps show the combined incidence of 10 features: unfragmented lands >500 acres, unfragmented lands >1000 acres, steep slopes (>25%), riparian areas, open habitat, wetlands, 100' wetland buffer areas, south-facing slopes >10%, deeryards, viewshed value >39 and viewshed value >140.[29] A pixel value of 8 indicates that 10 of the values co-occur in that 300 ft^2 (31m^2) area, a value of 0 indicates that no wildlife habitat features occur in that area. Appendix *Table 16* shows the number of acres in town of each co-occurrence category.

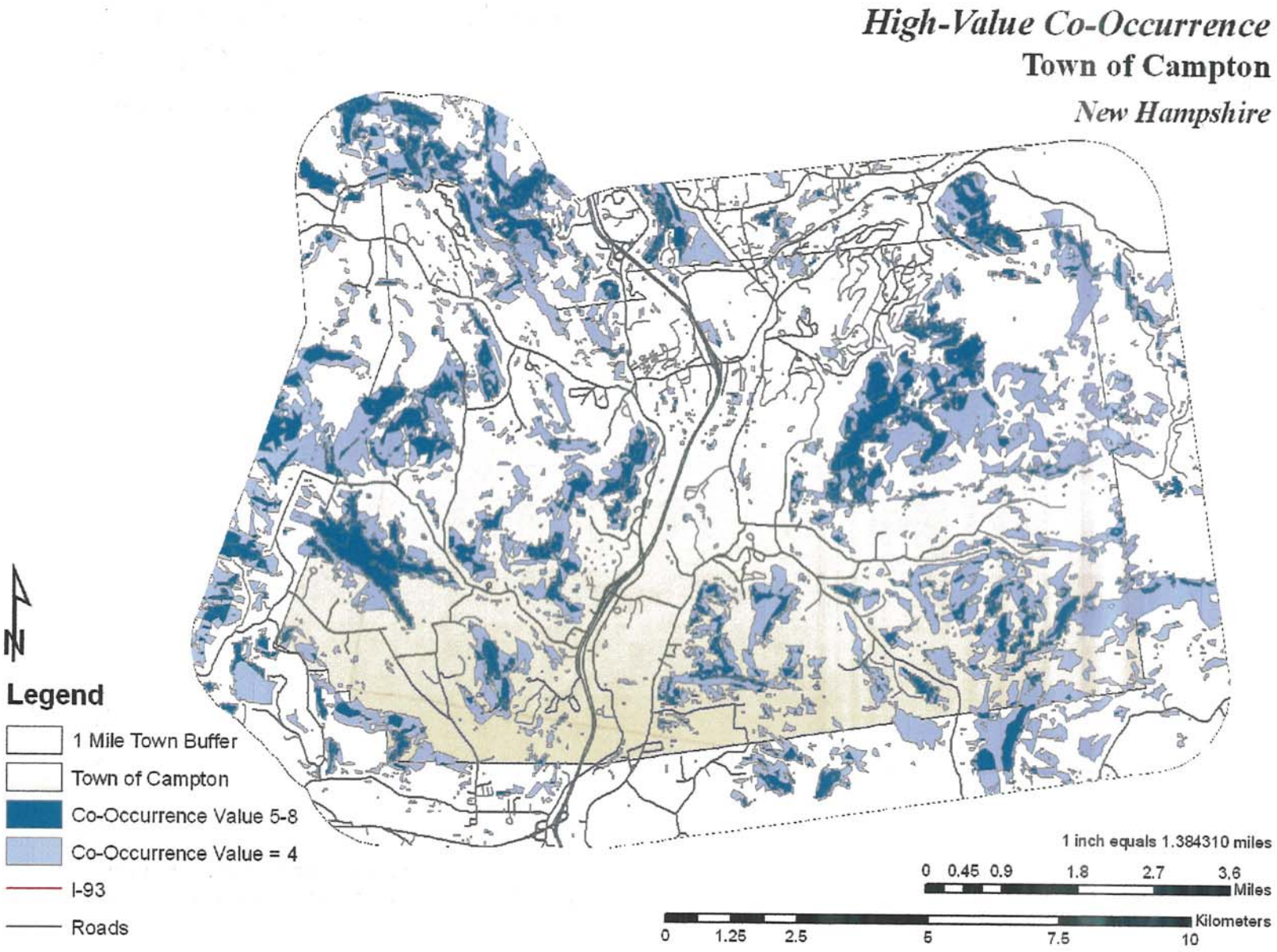
As can be seen in the High-Value Co-occurrence Map, the areas with the highest values are mostly higher elevation areas, the exception being the low-lying area surrounding Campton Bog. This makes sense, as these higher elevation areas are more visible (high viewshed values), have steeper slopes, and are less developed (high unfragmented lands value).

It is interesting to go back to the earlier discussion of alternative zoning scenarios, and look at how changes in zoning would impact identified high value areas. The Regulatory Scenarios Impact on High Value Areas map below is a re-print of the map on page 10 of this report, but with the identified high-value areas placed behind the build-out images. You can see by the way that the colorful, high-value areas show through the non-buildable regions that this change in zoning would do a lot in terms of preserving high-value regions in town. In fact, GIS analysis of this map shows that under current regulations, only 32% of identified high-value areas are non-buildable. If the Forest Conservation Zone regulations were applied town-wide, 68% of high-value areas would be non-buildable and therefore preserved from future development.

Finally, the Tax-Map Co-occurrence Analysis map shows the mean co-occurrence value for each lot in the Campton Tax Map. Appendix *Table 17* shows the number of parcels and combined acreage for each co-occurrence value.

[29] These values were chosen based on natural breaks ("Jenks") in the data.

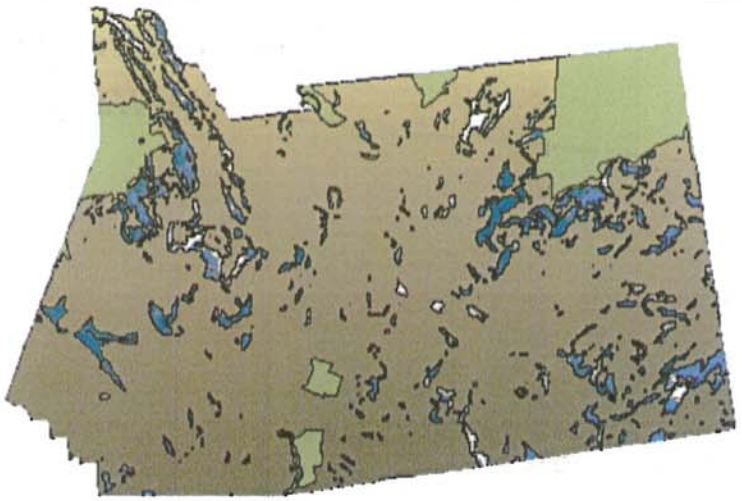

Legend
1 Mile Town Buffer
Town of Campton
0
1
2
3
4
5
6
7
8
Natural Resource Co-Occurrence
Town of Campton
New Hampshire
N
1 inch equals 1.397179 miles
0 0.5 1 2 3 4
Miles
Kilometers
0 1 2 4 6 8


High-Value Co-Occurrence
Town of Campton
New Hampshire
N
Legend
1 Mile Town Buffer
Town of Campton
Co-Occurrence Value 5-8
Co-Occurrence Value = 4
I-93
Roads
1 inch equals 1.384310 miles
0 0.45 0.9 1.8 2.7 3.6
Miles
0 1.25 2.5 5 7.5 10
Kilometers

Regulatory Scenarios Impact on High Value Areas

Town of Campton

New Hampshire



Buildable Land Under Current Regulations

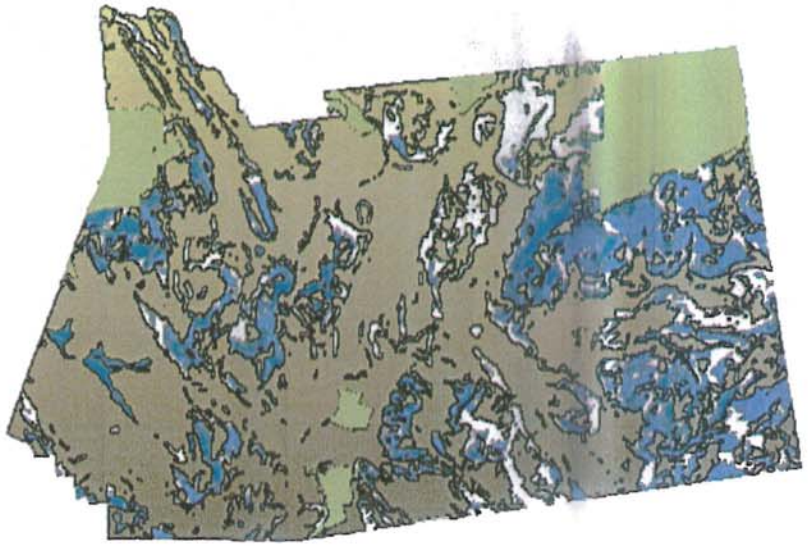
Restrictions: 20% slopes and poorly drained soils in the Forest Conservation Zone, 35% slopes and very poorly drained soils everywhere else in town.

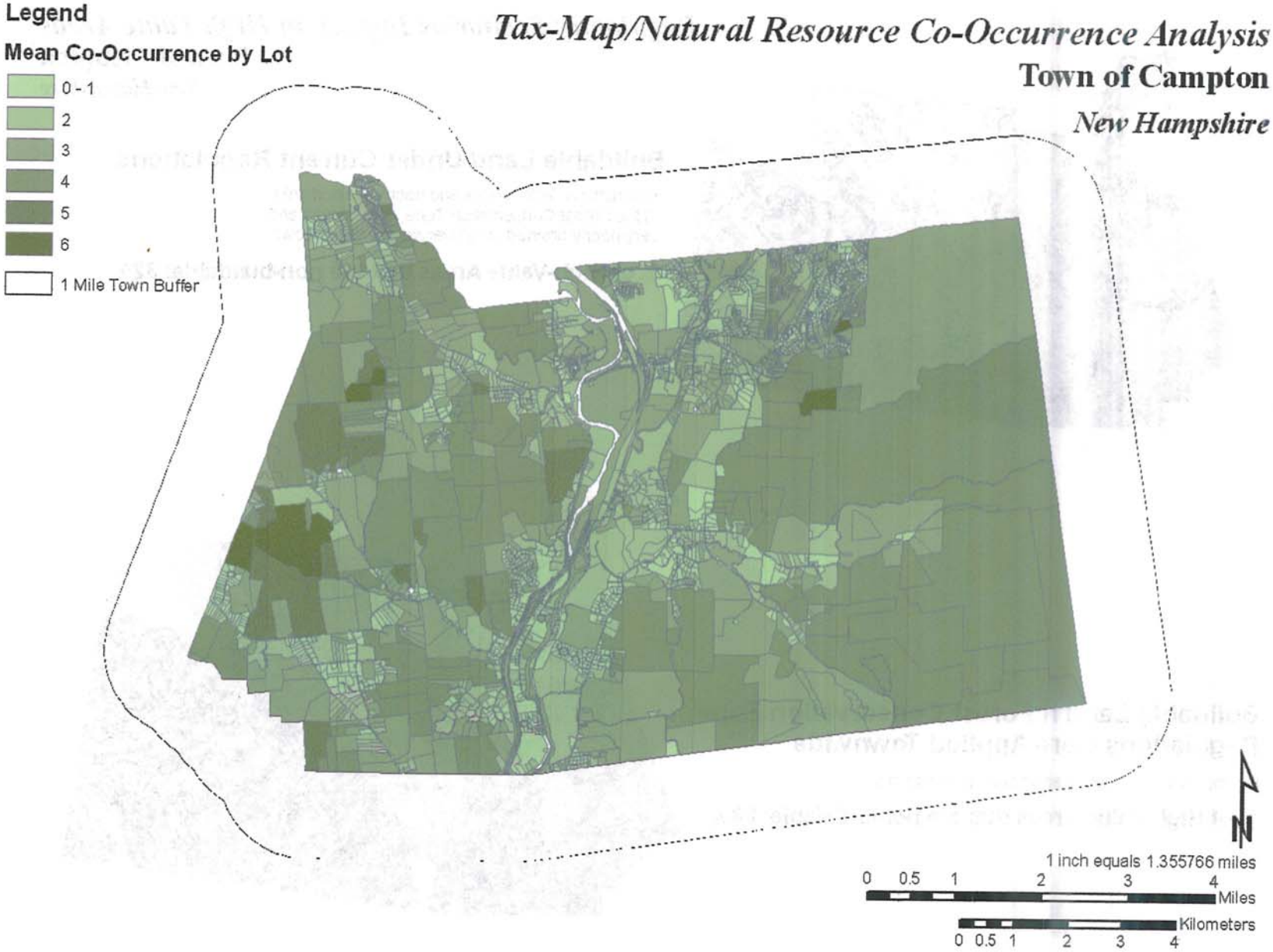
% of High-Value Areas that are non-buildable: 32%

Buildable Land If Forest Conservation Zone Regulations were Applied Townwide

Restrictions: 20% slopes and poorly drained soils

% of High-Value Areas that are non-buildable: 68%



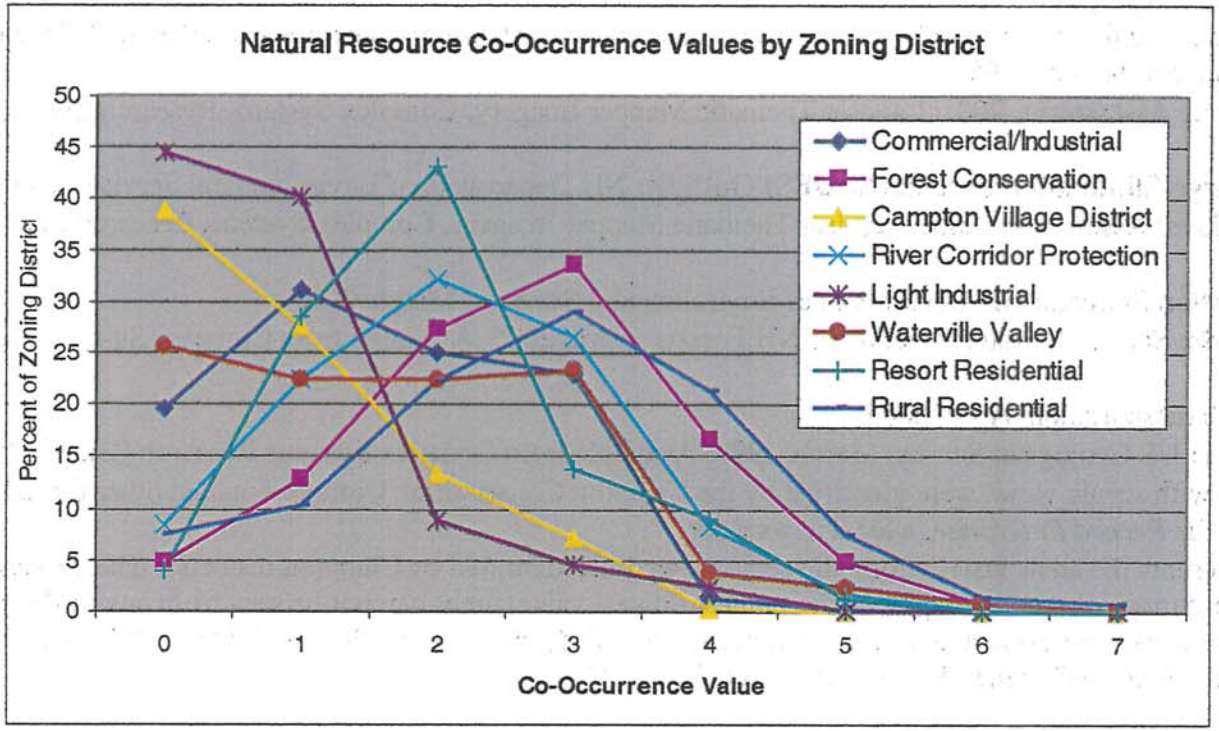

Legend
Mean Co-Occurrence by Lot
0 - 1
2
3
4
5
6
1 Mile Town Buffer
Tax-Map/Natural Resource Co-Occurrence Analysis
Town of Campton
New Hampshire
N
1 inch equals 1.355766 miles
0 0.5 1 2 3 4
Miles
Kilometers
0 0.5 1 2 3 4

Appendix *Table 18,* and *Figure 5,* below, compare and contrast the natural resource co-occurrence values of Campton's different zoning districts. *Table 18* lists the acreage of each zoning district that falls under each co-occurrence value, as well as the percentage of each zone covered by each co-occurrence value.

The Forest Conservation Zone appears to be well placed; however, it is small in comparison to the spread of high value areas throughout the town. The Rural Residential Zone, covering the most area of all of the zones, is the only zone that contains significant areas of co-occurrence values of 6 and higher. The highest value areas in town fall within this zone, in the region surrounding Bog Pond in the southwest of town, and the town's high elevation areas, specifically the region north of the Beebe River and south of Waterville Valley in the northeast of town.

Bearing the results of this analysis in mind when considering re-zoning options, the town may decide to extend the stricter development regulations of the Forest Conservation Zone south to encompass the Bog Pond area, thus working to conserve this identified high value region. The town may also want to consider creating an additional zone to protect the high elevation areas of high value.

Figure 5: Natural Resource Co-Occurrence Values by Zoning District



DATA SOURCES

- **Aerial Photography:** 2003 National Agricultural Imagery Program (NAIP). US Department of Agricultural APFO Aerial Photography Field Office. 2005. Obtained through the Society for the Protection of New Hampshire Forests (SPNHF).
- **Aquifers:** US Geological Survey, Pembroke NH. 2000. Available from Complex Systems Research Center, UNH.
- **Campton Places of Interest**: Geographic Names Information System (GNIS). US Geological Survey, in cooperation with the US Board on Geographic Names. January, 1999. Available from Complex Systems Research Center, UNH.
- **Deer Yards:** This layer represents deer wintering areas identified by New Hampshire Fish and Game Department's Wildlife Division and Law Enforcement staff from ground surveys and aerial photo interpretation. (June 2004)
- **Floodplains:** Federal Emergency Management Agency (FEMA), June, 2005. The floodplain data displayed here is the draft-pre-release DFIRM (Digital Flood Insurance Rate Map). It has not been accepted by the community and is therefore not the effective map. This data can not be used for flood determination.
- **Groundwater Hazards.** NH Department of Environmental Services. June 2005.
- **Historical Sites:** This list was developed by the Campton Historical Society and digitized using NH DOT roads and USDA NAIP aerial photography as part of this project.
- **Inactive/Abandoned Quarries and Gravel Pits:** This layer was created by extracting point features from the NH DES data on Point and Non-Point Pollution Sources. March, 1995.
- **Land Cover:** NH Land Cover Assessment, 2001. Landsat Thematic Mapper Imagery, Complex Systems Research Center, UNH. December, 2001.
- **National Pollutant Discharge Elimination System (NPDES) Outfalls:** NH Department of Environmental Services. June 2004.
- **Open Habitat:** NH Land Cover Assessment, 2001. Landsat Thematic Mapper Imagery, Complex Systems Research Center, UNH. December, 2001.
- **Point and Non Point Pollution Sources:** NH Department of Environmental Services. March, 2005.
- **Public and Protected Lands:** Society for the Protection of NH Forests. April, 2005. Available from Complex Systems Research Center, UNH.
- **Roads:** NH Department of Transportation. April, 2005.
- **DEM / Slope / Topography:** US Geological Survey, March, 1999. Available from Complex Systems Research Center, UNH.
- **Scenic Viewpoints:** Places with scenic views were identified by the Campton Conservation Commission and other Campton residents that responded to an add in the *Record Enterprise*, a local newspaper.
- **Viewsheds:** This layer represents the areas visible from all scenic viewpoints identified by Campton residents. The darkest (highest value) areas can be seen from many of these viewpoints, the lightest (lowest value) areas can not be seen from any of the identified viewpoints. Viewsheds were calculated using a Digital Elevation Model (DEM) produced by the US Geological Survey, March, 1999. The DEM data layer is available from Complex Systems Research Center, UNH.

- **Soils:** This layer is a digital version of standard, county-based soil surveys prepared by the Natural Resources Conservation Service (NRCS). September 2002. Available from Complex Systems Research Center, UNH.
- **Streams and Waterbodies:** US Geological Survey, NH Department of Environmental Services and Complex Systems Research Center. August, 2004. Riparian Areas were created by placing a 300' buffer around perennial streams, rivers and bodies of water.
- **Tax Map:** The Tax Map was digitized from paper maps prepared by Mountain Mapping, Campton, NH. (April, 2005).
- **Underground Storage Tank Facilities:** NH Department of Environmental Services. June 2005.
- **Unfragmented Lands:** This layer represents unfragmented blocks of natural landcover. It was created using methodology published by NH Fish and Game Department, in *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups.* (2001). This data layer was created by erasing all lands identified by the 2001 NH Land Cover Assessment Data as 'Residential/Commercial/Industrial' or 'Transportation.' Next, NH DOT roads (Legislative Classes I-V, or, all roads except those not regularly maintained by the Town or State), and NHDOT private roads were buffered by 300 feet, and erased. Only private roads that intersect or are extensions of a NHDOT class I-V road were included. Surface waters greater than ¼ mile wide and not surrounded by natural landcover were also erased. Finally, recent development not captured by the above analysis, but evident in the Campton Tax Map were also erased (lots <5 acres).
- **Watershed Boundaries:** US Department of Agriculture, Natural Resource Conservation Service and NH Department of Environmental Services. Available from Complex Systems Research Center. September, 2003.
- **Wetlands:** National Wetlands Inventory, US Fish and Wildlife Service. NH Fish and Game Department. Summer, 2001.
- **Zoning:** Zoning Districts were digitized from paper maps prepared by Mountain Mapping, Campton, NH. (July, 2005).

Thank you *to Dave McGraw and the Society for the Protection of New Hampshire Forests, Katie Callahan at New Hampshire Fish and Game, Carol Foss at New Hampshire Audubon, Ann Marie Foote and May Brosseau in the Campton Town Office, Campton's Select and Planning Boards and Conservation Commission, Walt Stockwell at the Campton Historical Society, Rodger Krussmann at the Trust for Public Land, Phil Auger at the University of New Hampshire, Jennifer Lingeman at the Complex Systems Data Center at UNH, George Hastings at NH DES, Anne Tate at the Rhode Island School of Design, and Adam Wienert, Molly Deringer, Matthew Vadeboncoeur, and Lynn Carlson at Brown University.*

Campton's Past, Present and Future

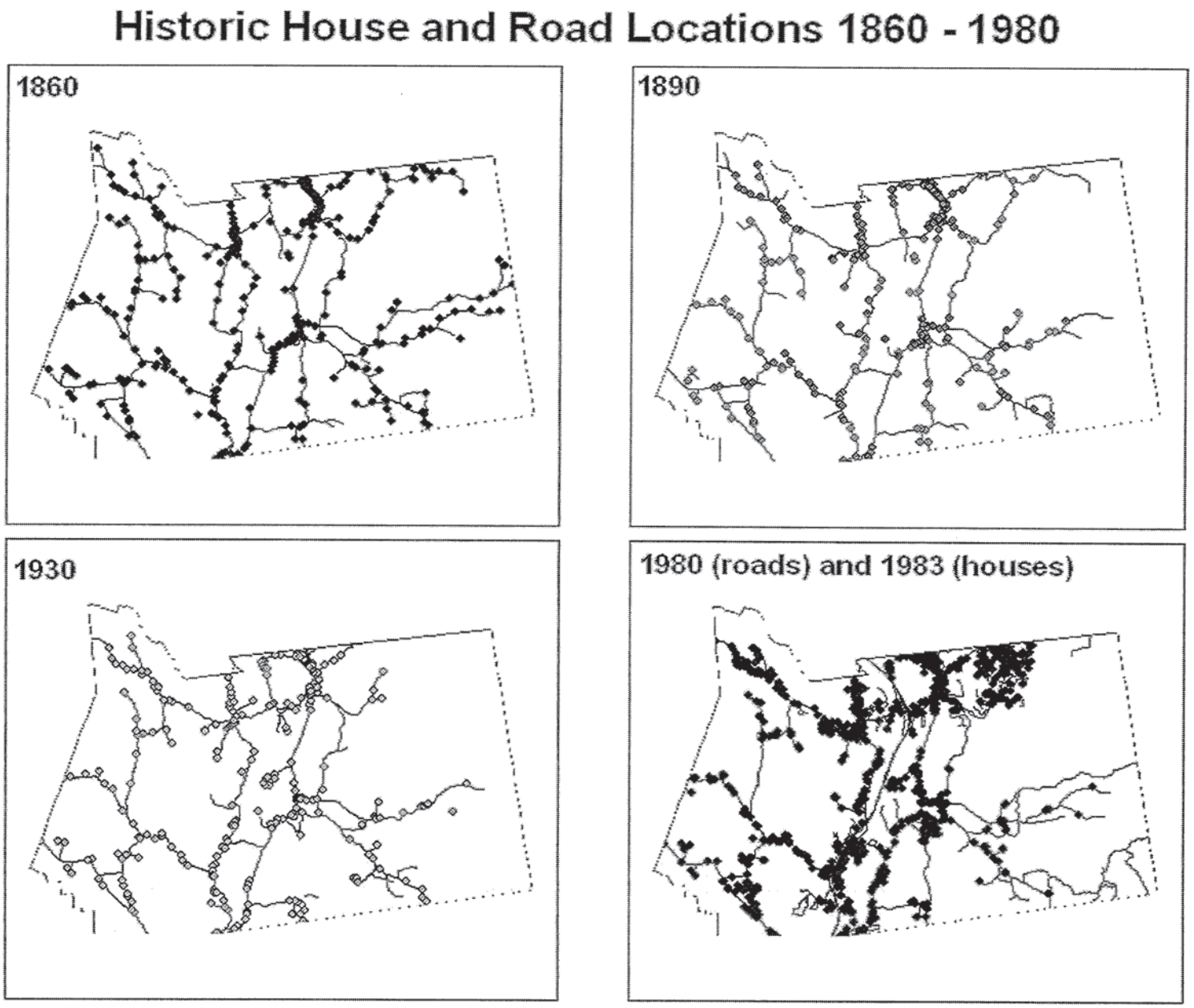
Planning for the Future of Campton, New Hampshire
A Geographic Information Systems Based Approach

February, 2005

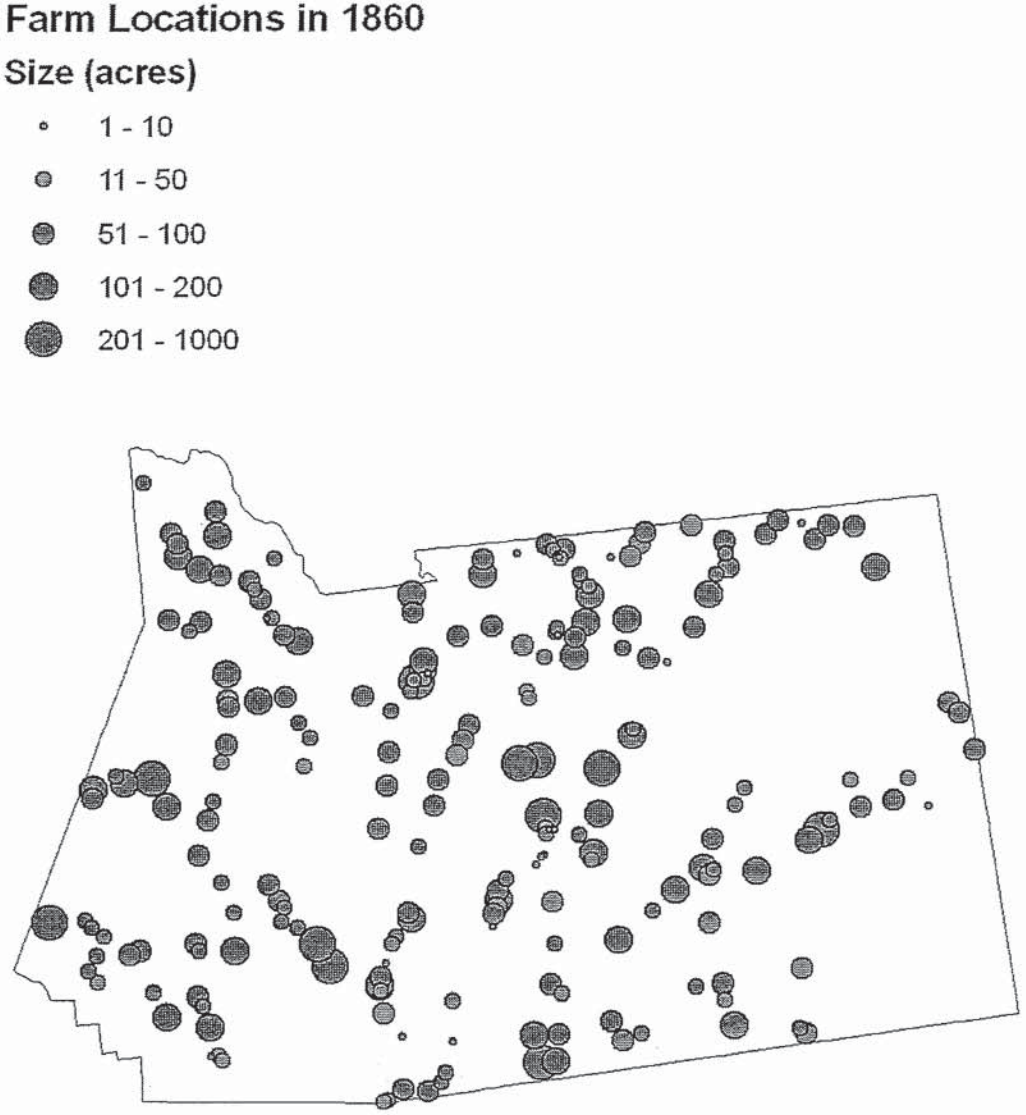
Appendix

Prepared by:
Stephanie Elson
With Dr. Steven Hamburg
Land Use Land Cover Change Working Group
Brown University
http://porter.geo.brown.edu/planetary/LCLUC_Owens/

Historical Maps 1 - 4: Historic House and Road Locations

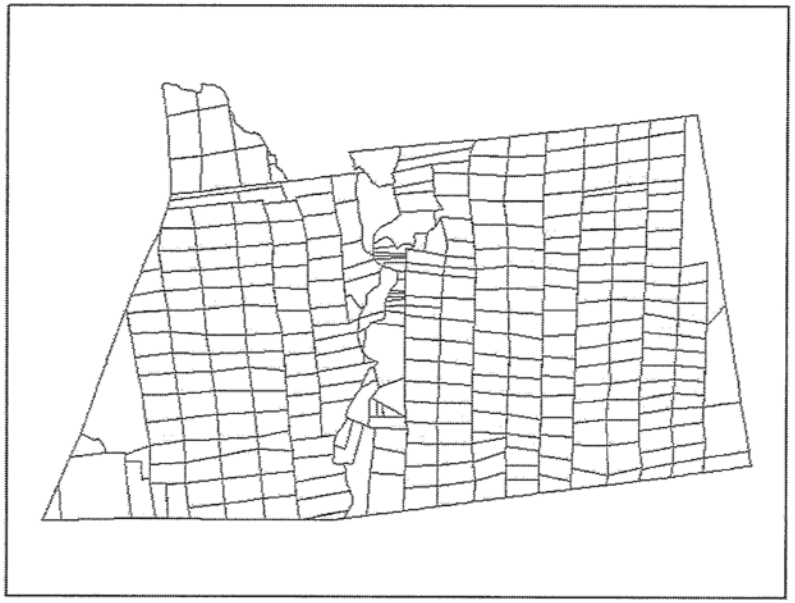


Historical Map 5: Distribution of Farmland in Campton, 1860



Historical Map 6: Original Proprietor's Lines

Original Proprietor's Lines



Campton Lot Lines, April 2005

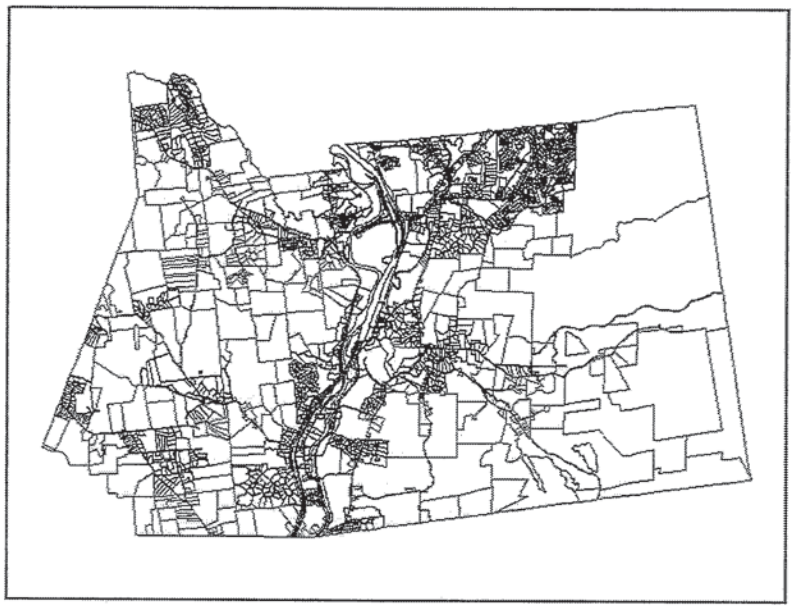


Table 1: Campton's Zoning Districts

Zoning District	Acreage	% of Campton
Campton Village District	1,037	3
Waterville Estates Village	967	3
Commercial	1,606	5
Forest Conservation	3,530	10
River Corridor Protection	2,292	7
Light Industrial	45	0
Resort Residential	368	1
Rural Residential	23776	71

Table 2: Campton Lots by Size

The majority of lots in the town are between 1-5 acres in size. However, a significant number of the lots in town are large, and remain relatively un-impacted by subdivision. In fact, the 5 largest lots in town, all over 500 acres in size, together represent 5,252 acres, or 16% of the town's total area.

Acreage	# Lots	Cumulative Acreage	% of Town[1]
0-1	821	382	1
1-5	1,452	2843	8
5-10	277	1713	5
10-20	141	1748	5
20-30	58	1146	3
30-40	33	1075	3
40-50	28	1126	3
50-100	62	4111	12
100-200	39	5021	15
200-500	15	4378	13
500-2,308	5	5252	16

[1] These percentage values don't add up to 100% due to the portion of land area that is public land, or dedicated to roads or rights-of-way.

Table 3: Buildable Land under different regulatory scenarios

Alternate Scenarios	Restrictions	Total Buildable Acres	% of Unprotected Land that's Buildable
Scenario 1	**Current Zoning** (>35% slopes, Very Poorly Drained Soils; Poorly Drained Soils and >20% slopes in the Forest Conservation zone)	27,247	90%
Scenario 2	**Current Zoning + Wetlands Restrictions**	26,517	87%
Scenario 3	**Current Zoning + restrictions on Wetlands, Floodplains, and Poorly Drained Soils**	24,383	80%
Scenario 4	**Current Zoning + restrictions on slopes >20% townwide**	19,703	65%

# of Houses that can be built under current zoning: 23,293

Table 4: Developing a Population Multiplier

We can estimate how many new residents these additional lots could bring to town by looking patterns of development during the past 10 years. From 1990 – 2000, the town grew by 342 new residents, and 236 new homes. Thus, there were 0.69 new homes built per new resident and 1.5 new residents per new home built. Applying these multipliers, we can calculate that 23,293 new housing units would mean 15,529 new year-round residents for the town. In the 2000 census, there were 2,719 permanent residents of Campton.

Number of Population Additions, 1990 - 2000:	342
Number of housing units built, 1990 - 2000:	236
# new residents per home built:	1.5
# homes built per new resident:	.69

Table 5: Population Projections & Housing Implications

NH Office of Energy and Planning			
Year	Population Projection	Total Housing Units	Acres consumed by new development, assuming 1 acre / dwelling
2010	3,090	2,132	258
2015	3,280	2,263	389
2020	3,430	2,367	493
2025	3,580	2,470 (a 32% increase in the number of homes in town)	596
Population Projections following rate of growth 1980 – 2000, 30% / decade			
2010	3,534	2,438	564
2015	4,064	2,804	930
2020	4,594	3,170	1,296
2025	5,283	3,645 (a 95% increase in the number of homes in town)	1,771

Table 6: Land Cover Analysis

The table below shows the number of acres of each land cover type both in Campton, and in Campton's Watershed. For example, there are approximately 5,818 acres of Beech/Oak Forest in Campton, representing 17% of the town. Campton's Watershed has 24,446 acres of Beech/Oak Forest, which is equivalent to 17% of the watershed area.

Land Cover Type	Campton (Acres)	Campton %	Campton Watershed (Acres)	Campton Watershed %
Residential/Commercial/Industrial	251	1	1,032	1
Transportation	824	2	2,557	2
"Developed" subtotal	**1,075**	**3%**	**3,589%**	**3%**
Row Crops	10	0	182	0
Hay/Pasture	947	3	3,457	2
Orchards	76	0	78	0
"Agricultural" subtotal	**1,034**	**3%**	**3,717%**	**2%**
Beech/Oak	5,818	17	24,446	17
Paper Birch/Aspen	2,503	7	9,133	6
Other Hardwood	4,840	14	23,892	17
White/Red Pine	2,897	9	9,765	7
Spruce/Fir	2,533	8	14,843	10
Hemlock	2,317	7	6,742	5
Mixed Forest	7,574	23	31,277	22
Alpine (Krumholz)	0	0	6	0
"Forested" subtotal	**28,483**	**85%**	**120,103**	**83%**
Water	552	2	9,334	6
Forested Wetland	73	0	387	0
Open Wetland	316	1	1,642	1
"Wetlands" subtotal	**941**	**3%**	**11,363%**	**7%**
Disturbed	134	0	405	0
Bedrock/ Veg.	0	0	186	0
Other Cleared	1,954	6	5,210	4
"Other" subtotal	**2,087**	**6%**	**5,801%**	**4%**
Total	**33,620**	**100%**	**144,573%**	**100%**

Table 7: Public Lands, Common Areas and Conservation Easements[2]

NAME	Acres within Campton	Primary Protection Type	Access	Primary Protecting Agency/ Organization	Protection Level	Management Status*	Total Area (Acres)
White Mountain National Forest	2,165	Fee Ownership	Access Allowed	US Dept. of Agriculture, Forest Service	Permanent Conservation Land	2	727,621
Pemigewasset WMA	93	Fee Ownership	Access Allowed	NH Fish & Game	Permanent Conservation Land	3	95
Parker Family Trust	523	Conservation Easement	Unknown	Society for the Protection of NH Forests	Permanent Conservation Land	9	578
Blair State Forest	115	Fee Ownership	Access Allowed	NH Dept. of Resources & Economic Dev. (DRED)	Permanent Conservation Land	2	115
Livermore Falls State Forest	144	Fee Ownership	Access Allowed	NH Dept. of Resources & Economic Dev. (DRED)	Permanent Conservation Land	3	144
Pulsifer Hill	10	Conservation Easement	Not Allowed	Squam Lakes Conservation Society	Permanent Conservation Land	3	151
Livermore Falls State Forest	22	Fee Ownership	Access Allowed	NH Dept. of Resources & Economic Dev. (DRED)	Permanent Conservation Land	3	52
Blair Woodland Natural Area	17	Fee Ownership	Access Allowed	Campton Conservation Commission	Permanent Conservation Land	2	17
Waterville Estates Association Land	1	Fee Ownership	Unknown	Waterville Estates Village District	Unofficial Conservation Land – Not Permanantly Protected	3	1
Common Areas (21 individual lots)	111	Common Lands in Subdivisions	Not Allowed	n/a	Permanent Conservation Land	9	111
	TOTAL ACRES IN CAMPTON = 3,184						TOTAL ACRES = 728,868

* 1= A tract totally protected from conversion of natural land cover and with a management plan in operation to maintain land in a natural state. Natural processes are allowed to proceed without interference or are mimicked through management practices. 2= A tract totally protected from conversion of natural land cover and with a management plan in operation to maintain a primarily natural state, but where uses (e.g. vehicular traffic, hunting, etc.) and/or suppression of natural processes may degrade the quality of existing natural communities. 3= A tract protected from conversion of natural cover for more than 50% of area, but subject to extractive uses such as timber harvest or mining. 4= A tract with more than 50% of area unprotected from conversion of natural cover, or planned or in use for agriculture, or as "open space" for active recreation purposes. Natural processes are altered or replaced by human use and management of the land. 9= Unknown

[2] Calculated from NH Land Cover Assessment, 2001. Landsat Thematic Mapper Imagery, Complex Systems Research Center, UNH. December, 2001.

Table 8: Sites of Historical Significance

Site_ID	Site
1	Beebe River "cave"
2	Beebe River Village
3	Blair Bridge
4	Blair Cemetery
5	Blair Chapel
6	Blair School
7	Bog School
8	Branch School
9	Bump Bridge
10	Campton Congregational Church
11	Campton Town House
12	Center School
13	Depot/Station
14	Dole Mill
15	Hildreth School
16	Livermore Falls (Fish Hatchery)
17	Livermore Falls School
18	Lower Village School
19	Town Pound
20	Turkey Jim's Bridge
21	West Road School

Table 9: Scenic Resources

ID	Scenic Viewpoints
1	Mount Percival
2	Mount Morgan
3	Bald Mountain
4	Campton Bog 1
5	Perch Pond (North)
6	Campton Pond
7	Campton Upper Village
8	Blair Bridge
9	Blair Bridge (upriver)
10	Blair Bridge (downriver)
11	Bump Bridge
12	Fields around Bump Bridge (South)
13	Fields around Bump Bridge (North)
14	Perch Pond (South)
15	Mason and Chandler Roads
16	Campton Bog 2
17	Campton Bog 3
18	Campton Bog Pond Dam
19	Blair Cemetery
20	Livermore Falls
21	Beebe River Falls
22	Berry Farm

ID	Scenic Roads and Paths
1	Beech Hill Rd
2	Pulsifer Rd
3	Meadow Ln
4	Us Rt 3 (S)
5	Hogback Rd
6	Bog Rd
7	Mason Rd
8	Ellsworth Hill Rd
9	Waterville Estates scenic rds
10	Puckerbrush Rd
11	Page Hill Rd
12	Us Rt 3 (N)
14	Roads surrounding Campton Pond
15	NH Route 49

Table 10: Unfragmented Lands[3,4]

Area Rank	Acres	Protected Acres	% Protected	Acres in Campton	% in Campton
1	58,200	46,100	79%	1,100	2%
2	21,800	4,476	21%	9,900	45%
3	15,700	7,500	47%	4,700	30%
4	6,000	600	10%	2,500	41%
5	2,300	100	5%	900	38%
6	1,600	0	0%	1,400	87%
7	1,400	0	0%	1,200	84%
8	1,000	0	2%	0	2%
9	800	0	1%	200	26%
10	400	0	0%	400	100%
11	400	200	44%	400	100%
12	400	0	0%	400	100%
13	300	0	0%	300	100%
14	200	0	0%	200	100%
15	200	100	42%	100	32%
16	200	100	31%	200	96%
17	200	0	0%	200	100%
18	200	0	0%	200	100%
20	100	0	0%	100	100%

[3] Acreages were rounded to the nearest hundred.
[4] Unfragmented area '19' just barely intersects the Campton town boundary. It is included in the map, but not included in the above chart.

Table 11: Listed Threatened (T) and Endangered (E) Species in Campton

Species or Community Name	Listed?		# Reported in the last 20 years	
	Federal	State	Town	State
Natural Communities - Palustrine				
**Silver maple - false nettle - sensitive fern floodplain forest	—	—	1	22
Plants				
Andrews' Gentian (Gentiana andrewsii)	—	T	Historical	7
Hound's-toungue (Cynoglossum boreale)	—	E	Historical	6
*Millet-grass (Milium effusum)	—	T	1	—
Small Yellow Lady's-slipper (Cypripedium parviflorum)	—	E	Historical	10
Vertebrates- Bat Hibernacula				
hibernaculum (Bat hibernaculum)	—	—	1	7
Vertebrates- Mammals				
**American Marten (Martes americana)	—	T	1	5
Vertebrates- Reptiles				
**Wood Turtle (Glyptemys insculpta)	—	—	3	108

**** **Highest:** An excellent example of a globally rare species or natural community

*** **Extremely High:** A good example of a global rarity or an excellent example of a state rarity

** **Very High:** A marginal example of a global rarity or a good example of a state rarity

* **High:** A marginal example of a state rarity

Tables 12, 13 & 14: Threats to Campton's Groundwater Quality

Table 12: Groundwater Hazards

Groundwater Hazards		
Site Name	**Project Type**	**RISK**
Campton Village Precinct	Underground injection control: discharges of benign wastewaters not requiring a groundwater discharge permit.	LEVEL 2: In wellhead protection area, or within 1,000 feet of well
Plymouth Hotel	Leaking underground storage tank	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Mobil 17747	Leaking underground storage tank, Underground injection control: discharges of benign wastewaters not requiring a groundwater discharge permit.	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Mack Residence	Non-petroleum related contamination	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Campton Corners Conv. Mart	Leaking underground storage tank	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Edgle's Garage	Leaking underground storage tank	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Pike Industries Inc Plant 616	Underground injection control: discharges of benign wastewaters not requiring a groundwater discharge permit.	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Tru-Tech (Fmr Beebe River Mill Complex)	Unlined wastewater lagoon	LEVEL 2: In wellhead protection area, or within 1,000 feet of well
Fmr Beebe River Mill Lagoon	Non-petroleum related contamination	LEVEL 7: Low concentration, alternative water available.
Campton Fire Station	Non-hazardous, non-sanitary holding tank registration	LEVEL 2: In wellhead protection area, or within 1,000 feet of well
Plymouth Hotel	Non-petroleum related contamination	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Former Beebe River Mill S&G Pit	Non-petroleum related contamination	LEVEL 8: No sources or ambient groundwater quality standards violations onsite

Clark Property	Leaking residential or commercial heating oil tanks	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Sno-Base Condominiums	Leaking residential or commercial heating oil tanks	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Sno-Base Condominiums	Leaking residential or commercial heating oil tanks, leaking residential or commercial heating oil tanks	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Sno-Base Condominiums	Leaking residential or commercial heating oil tanks	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Jay Conley/Design One Hairstyling	Underground injection control: discharges of benign wastewaters not requiring a groundwater discharge permit.	LEVEL 8: No sources or ambient groundwater quality standards violations onsite
Gerber/Hagerty Property	Leaking residential or commercial heating oil tanks	LEVEL 8: No sources or ambient groundwater quality standards violations onsite

Table 13: Point/Non-point Pollution Sources

Point/Non-point Pollution Sources

Type	Site Name	Active?
Mine, Sand and Gravel	Campton Sand and Gravel	active
Mine, Sand and Gravel	Campton Sand and Gravel	active
Mine, Sand and Gravel	Campton Sand and Gravel	active
Sand/Salt Storage Pile, Covered		active
Mine, Sand and Gravel	Exit 29 Associates	inactive

Table 14: Underground Storage Tanks

Underground Storage Tanks

Facility	Address	Facility Type	# of Tanks
Campton Elementary School	1110 Rte 175	Local Government	1
Verizon Central Office	Owl St	Utilities	1
Campton Corners Conv. Mart	11 Vintinner Rd/Box 1	Gas Station	2
Chesley's Mini Mart	Rte 3	Gas Station	3
Mobil 17747	Rte 49	Gas Station	3

Table 15: Current Use Analysis

Currently, a small percentage of the lots in town are registered for the Current Use designation, but these lots represent ~60% of the total land in town.

In Current Use?	# Lots	Acres
Yes	334	19,263
No	2,598	13,507

Table 16: Co-Occurrence

Co-Occurrence Category	Acres in Campton
0	2,836
1	4,521
2	7,990
3	9,349
4	6,143
5	2,108
6	412
7	180
8	0.50

Table 17: Campton Lots by Co-occurrence Value

Mean Co-occurrence Value	# of Parcels	Total Acres
0	325	322
1	555	1840
2	1048	4875
3	484	12690
4	205	11918
5	27	1038
6	2	95

Table 18: Natural Resource Co-Occurrence Value Acreage by Zoning District

	Commercial/ Industrial		Forest Conservation		Campton Village District		River Corridor Protection		Light Industrial		Waterville Valley		Resort Residential		Rural Residential	
Co-Occurrence Value	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%	acres	%
0	373	20	161	5	132	39	192	8	20	44	247	26	15	4	1,840	7
1	593	31	446	13	395	28	513	23	18	40	216	22	105	28	2,516	10
2	475	25	961	27	281	13	735	32	4	9	215	22	159	43	5,496	22
3	436	23	1,181	34	135	7	605	27	2	4	224	23	51	14	7,137	29
4	25	1	583	17	73	0	190	8	1	2	36	4	34	9	5,241	21
5	3	0	169	5	4	0	40	2	0	0	21	2	5	1	1,869	8
6	0	0	23	1	0	0	5	0	0	0	8	1	0	0	347	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL:	1,905	100%	3,524	100%	1,020	100%	2,280	100%	45	100%	967	100%	369	100%	24,626	100%